BY ORDER OF THE SECRETARIES OF THE AIR FORCE, THE ARMY, THE NAVY, THE MARINE CORPS, THE DEFENSE LOGICTICS AGENCY, AND THE DEFENSE CONTRACT MANAGEMENT AGENCY

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PREPARING HAZARDOUS MATERIALS FOR MILITARY AIR SHIPMENTS

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This manual implements AFPD 24-2, *Preparation and Movement of Air Force Material*. It provides guidance and procedures for preparing hazardous materials for shipment by military aircraft to ensure that such materials are packaged, marked, labeled, and prepared properly for transportation. This manual includes the shipment of nuclear materials, except for nuclear weapon major assemblies and nuclear components packaged and shipped per Department of Energy-Defense Nuclear Agency (DOE-DNA) TP 45-51 and its supplements. It includes labeling requirements, instructions for transporting passengers with hazardous materials and instructions for notifying the aircraft commander regarding hazardous materials on the aircraft. It implements Department of Defense (DOD) Regulation 4500.9-R, *Defense Transportation Regulation (Parts II and III)* and Department of Transportation (DOT) Special Permits 7573 and 9232 (DOT-SP 7573 and DOT-SP 9232) for commercial aircraft under contract to the Air Mobility Command (AMC). The use of a name of any specific manufacturer, commercial product, commodity or service in this publication does not imply endorsement by the military *services.** **Penalties and Disciplinary Action.** Failure to observe prohibitions and mandatory provisions of this manual in paragraphs **A5.2.**, **A5.3.**, **A5.4.2.**, **A5.5.**, **A5.6.**, **A5.7.**, **A5.8.**, **A5.9.**, **A5.10.**, **A5.11.**, **A5.12.**, **A5.13.**, **A5.14.**, **A5.15.**, **A5.16.**, **A5.17.**, **A5.18.**, **A5.19.**, **A5.20.**, **A5.21.**, **A5.22.**, **A5.23.**, **A5.24.**, **A5.25.**, **A5.26.**, **A5.27.** **A5.28.**, **A6.2.**, **A6.3.**, **A6.4.**, **A6.5.**, **A6.6.**, **A6.7.**, **A6.8.**, **A6.9.**, **A6.10.**, **A6.11.**, **A6.12.**, **A6.13.**, **A6.14.**, **A6.15.**, **A6.16.**, **A6.17.**, **A6.18.**, **A6.19.**, **A6.20.**, **A6.21.**, **A6.22.**, **A7.2.**, **A7.3.**, **A7.4.2.**, **A7.5.**, **A7.6.**, **A8.2.**, **A8.3.**, **A8.4.**, **A8.5.**, **A8.6.**, **A8.7.**, **A8.8.**, **A8.9.**, **A8.10.**, **A8.11.**, **A8.12.**, **A8.13.2.**, **A8.14.**, **A8.15.**, **A8.16.**, **A8.17.**, **A8.18.**, **A9.3.**, **A9.4.**, **A9.5.**, **A9.6.**, **A9.7.**, **A9.8.**, **A9.9.2.**, **A9.10.**, **A10.2.2.**, **A10.3.1.**, **A10.4.**, **A10.5.**, **A10.6.2.**, **A10.7.**, **A10.8.2.**, **A10.8.3.**, **A10.8.4.**, **A10.9.**, **A10.10.**, **A11.2.**, **A11.6.**, **A11.7.**, **A11.8.**, **A11.9.**, **A11.10.**, **A11.11.**, **A11.12.**, **A12.2.**, **A12.3.**, **A12.4.**, **A12.5.**, **A12.6.**, **A12.7.**, **A12.8.**,

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SUMMARY OF CHANGES

This interim change (IC) 2007-01 addresses areas of subject manual that require correction and clarification. This IC also corrects attachment **A17.3.** Sample Shipper's Declaration For Dangerous Goods, to add the letters "UN" to the number on Key 11. A bar (|) indicates changes since the last edition.

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Chapter 1

GENERAL GUIDANCE

1.1. Applicability. Handlers, packers, inspectors, and preparers (certifiers) of hazardous materials shall comply with rules designed to maximize safety and security of the aircraft, aircrew, cargo and passengers. They must know the exceptions, special permits, and waivers to federal laws and related government directives that are unique to military airlift operations and how to apply them.

1.1.1. This manual governs the transport of hazardous material when entered into the Defense Transportation System (DTS) as cargo on military controlled fixed and rotary wing aircraft according to DOD 4500.9R, Defense Transportation Regulation. Apply the requirements specified in this manual unless modified or updated according to paragraph **1.2.1.**

1.1.2. Hazardous materials required as operational equipment of the aircraft for ground/air servicing as identified in applicable aircraft flight publications are not regulated by this manual.

1.1.3. The provisions of this manual are directive in nature, and must be complied with by those personnel whose positions or jobs entail responsibility for the functions covered.

1.1.4. Ensure compliance with current applicable DOT and EPA requirements when transporting hazardous materials outside of the Defense Transportation System. Hazardous waste shipments entering or exiting a domestic location must comply with 40 CFR Parts 260-265, including preparation of a hazardous waste manifest. Hazardous waste shipments originating and terminating at OCONUS locations must comply with applicable local regulations as appropriate. If local regulations do not exist, comply with 40 CFR Parts 260-265.

1.2. Responsibilities Assigned.

1.2.1. Office of Primary Responsibility (OPR) will publish emergency changes of an operational or technical nature that do not change policies or major procedures without service coordination. Coordinate all policy changes with Service focal points. Issue hazardous cargo information, clarifications, updates, procedural and policy changes to Air Force activities and Service focal points. Focal points retransmit changes to their respective service or agency shippers.

1.2.2. Service Focal Points jointly establish procedures and prepare any documentation necessary to implement this manual. Users contact their Service focal points for all clarifications and waivers. Service focal points are:

1.2.2.1. Air Force. AFMC LSO/LOT, 5215 Thurlow Road, Suite 5, Wright-Patterson AFB, OH 45433-5540, (937) 257-4503/1984, DSN: 787-4503/1984.

1.2.2.2. Army. US Army Material Command, Logistics Support Activity, Packaging, Storage, and Containerization Center, ATTN: AMXLS-AT, 11 Hap Arnold Blvd, Tobyhanna PA 18466-5097, (570) 895-7144/7070, DSN: 795-7147/7070.

1.2.2.3. Navy. Commander, Naval Inventory Control Point, Code 0772.12, P.O. Box 2020, 5450 Carlisle Pike, Mechanicsburg, PA 17055-0788, (717) 605-2784, DSN: 430-2784.

1.2.2.4. Marine Corps. Commandant of Marine Corps (LPC-2), Headquarters, U.S. Marine Corps, 2 Navy Annex, Washington, DC 20380-1775, (703) 695-8947, DSN: 225-8947.

1.2.2.5. Defense Logistics Agency. Defense Logistics Agency, Attn: J3731, 8725 John J. Kingman Road, Suite 4330, Fort Belvoir VA 22060-6221, (703) 767-6582, DSN: 427-6582.

1.2.2.6. Defense Contract Management Agency. Defense Contract Management Agency Center, Packaging Center, Attn: DCMAC-JP, 2690 Howitzer Street, 3rd Floor, Fort Sam Houston, TX 27234-6002, (210) 295-0105, or ATTN: DCMAC-JP, 495 Summer Street, Boston, MA 02210-2184, (617) 753-4134.

1.2.3. Packers package hazardous materials, but do not sign legally binding documents.

1.2.4. Preparers certify that hazardous materials are properly classified, described, packaged, marked and labeled, and in proper condition for military airlift according to the applicable regulations of the Department of Transportation and this manual. Preparers include Technical Specialists. These individuals are qualified based on their training in handling and preparing the hazardous material in the performance of their duties.

1.2.5. Handlers maintain safe operations when transporting hazardous materials and proficiency in job specific responsibilities. Handlers include warehouse workers, aircraft load teams, pallet build-up personnel, and other individuals who routinely come into contact with hazardous materials but do not package, inspect, or certify.

1.2.6. Inspectors ensure hazardous materials are properly prepared and documented before entering into the military airlift system (see **Attachment 28**).

1.2.7. Installation or Activity Commanders (or their designated representatives).

1.2.7.1. Train personnel according to paragraph **1.3.**

1.2.7.2. Appoint preparers as certifying officials to complete the Shipper's Declaration for Dangerous Goods Certification. This authorization must include the scope of the individual's authority and qualified training according to **Attachment 25**. Document the authorization in writing, electronically, or other auditable method.

1.2.8. Contracting Officers. Ensure all DOD contracts and purchase requests for hazardous materials include the provisions of the supplement to the Federal Acquisition Regulation (FAR), Paragraph 52.228-7007 (Safety, Ammunition, and Explosives). Contractors get copies of specifications, standards, and publications from the procuring agency or as directed by the contracting officer.

1.2.9. Air terminal or base operations personnel. Notify the aircraft commander (or designated representative), in writing, of all hazardous materials aboard the aircraft. The activity responsible for delivering the cargo to the aircraft provides this notification in the absence of an established air terminal or base operation. The briefing agency must meet the requirements of **Attachment 21**.

1.3. Hazardous Material Training Requirements. Commanders assign hazardous material workers and ensure each successfully completes relevant training. Train hazardous material workers according to **Attachment 25**. Training for all levels of hazardous material workers who may effect the safety and security of hazardous materials in transportation, as a minimum, must address the following areas:

1.3.1. Hazardous material general awareness and familiarization.

1.3.2. Safety procedures to include emergency response.

1.3.3. Function specific responsibilities directly relevant to the individual's role in hazardous material transportation.

1.3.4. Security awareness.

1.4. Special Assignment Airlift Missions (SAAM). Process SAAM requests, cargo clearance, and appropriate confirmations according to DOD 4500.9-R, Defense Transportation Regulation. Unless specifically exempted under the provisions of paragraph **2.3.**, properly prepare, package, mark, label, and document all hazardous materials transported by SAAM aircraft according to this manual. Do not automatically apply the provisions of **Chapter 3** for use of SAAM aircraft. Refer to paragraphs **3.2.** and **3.3.** for validation and use of SAAMs for tactical, contingency, or emergency operations.

1.5. Transportability Design Criteria. Configure hazardous materials (items and articles) to ensure transportability on military aircraft. Items in their shipping configuration and skidded or wheeled equipment must meet the transportability design criteria identified in MIL-HDBK-1791, *Designing for Internal Aerial Delivery in Fixed Wing Aircraft.*

1.6. General Packaging Requirements. Package hazardous materials in containers authorized by this manual, Title 49 *Code of Federal Regulations* (CFR) Part 173, the *International Civil Aviation Organization* (ICAO) *Technical Instructions*, or the *International Air Transport Association* (IATA) *Dangerous Goods Regulation*. **Attachment 3** applies to all military air shipments. See paragraph **A17.1.2.** for certification instructions.

1.7. United Nations (UN) Performance Specification Packaging. Prepare hazardous materials in UN specification containers unless exempted by a specific packaging paragraph in this manual. DOD activities use the DOD POP Program to locate tested and authorized DOD packaging configurations. If the hazardous material is procured in a manufacturer's UN specification container, use that container. Ensure compliance with all other requirements of this manual, including air-eligibility. If the managing activity has specified a container Special Packaging Instruction (SPI), use that UN specification container. Frustrate hazardous cargo not correctly packaged and marked to UN specification requirements. For additional information concerning UN specification packaging or performance test requirements see DLAD 4145.41/AR 700-143/AFJI 24-210/NAVSUPINST 4030.55/MCO 4030.40A, *Packaging of Hazardous Material.* Service focal points are unable to waive UN specification requirements.

1.7.1. Exempt Items. The following materials are exempt from UN performance specification packaging test requirements. The packaging paragraph from **Table A4.1.** will specify required packaging. While UN specification packaging is not required, material may be subject to package performance tests.

1.7.1.1. Compressed gas cylinders

1.7.1.2. Radioactive material

1.7.1.3. Dry ice

1.7.1.4. Magnetized material

1.7.1.5. Life-saving appliances

1.7.1.6. Mercury contained in manufactured articles

1.7.1.7. Items identified in this manual as requiring "strong outer packaging"

1.7.1.8. Limited and Excepted Quantities.

1.7.1.9. Packages whose net mass exceeds 400 kg (882 pounds) or with a capacity exceeding 450 liters
(119 gallons)

1.7.2. Grandfathered Items. Government-owned explosives (Class 1) packaged before January 1990 are exempt from UN specification requirements. Ship these items under the packaging requirements in effect at the time of packaging. Annotate key 19 of the Shipper's Declaration for Dangerous Goods "Government-owned goods packaged before 1 January 1990." See **Attachment 17** for certification instructions.

1.8. Fueled Vehicles and Equipment. Limit quantity of fuel within a vehicle or wheeled support equipment to a minimum. Do not exceed the maximum fuel in tank limits specified in **Attachment 13**. Commanders must consider availability of fuel at the destination and operational requirements for mission readiness when determining fuel levels and ship with less than the maximum allowable amount when applicable. The preparer (certifying official) must ensure any unnecessary fuel is drained prior to shipment.

1.9. Damaged or Improper Shipments. Do not transport any damaged, leaking, or improperly packed, marked, or labeled item or material.

1.9.1. It is the originator's responsibility to correct noncompliant packaging. The originating shipping activity may provide the transportation function necessary packaging to correct the shipment, within the capability of the transportation function, or correct the packaging on site. Consider urgency of need when determining the best method for correcting a deficient shipment. Costs related to correcting a shipment are the responsibility of the originating shipping activity. Ensure compliance with applicable modal regulations when offering any shipment for transportation.

1.9.2. Report deficiencies on SF 364, *Report of Discrepancy (ROD)* or equivalent reporting means as designated by the Service Focal Points. Report leaks from packages, equipment, and self-propelled vehicles during loading or unloading, or in flight as a packaging deficiency.

1.9.3. Immediately report any release of a hazardous substance in a quantity equal or greater than its reportable quantity to the Environmental Protection Agency (EPA) by calling the US Coast Guard National Response Center at 800-424-8802 or 202-267-2675.

1.9.4. Consult local installation operating procedures for hazardous material emergency planning, response, and reporting requirements in the event of an incident involving hazardous materials.

1.9.5. Do not move dropped or damaged explosive items. The Transportation or Packaging Office will immediately contact Explosive Ordnance Disposal (EOD), safety or munitions personnel to determine disposition.

1.10. Empty Containers, Cylinders, Radioactive Packages and Nonhazardous Materials. Except as specified in this paragraph, empty containers or articles are not subject to any other requirements of this manual.

1.10.1. Empty Containers. Inspect packages that formerly contained a hazardous material covered by this manual to determine the presence or absence of hazardous material. If there is presence of hazardous material, purge the hazardous material or the package is regulated in the same manner as prescribed for the package when it was full. A container is considered empty if:

1.10.1.1. A hazardous article has been removed from its container and there is no possibility of remaining residue (i.e., empty torpedo or missile containers).

1.10.1.2. If the container has been purged of the hazardous material it previously contained.

1.10.2. Empty Cylinders. Compressed gas cylinders are empty if the pressure in the cylinder is less than 40 pounds per square inch absolute (psia) at 21 degrees C (70 degrees F). Psia equals the gauge pressure plus atmospheric pressure (14.7 psi).

1.10.2.1. Before shipment, inspect empty cylinders for dents, bulges, oxidation pits, or other damage. Handle faulty cylinders as required by the latest DOT regulations or DLAI 4145.25/A700-68/ NAVSUPINST 4440.128D/MCO 10330.2D/AFMAN 23-227(I), *Storage and Handling of Liquefied and Gaseous Compressed Gasses and Their Full and Empty Cylinders.*

1.10.2.2. Tightly close valves of cylinders before offering for transportation. The requirements of **A3.3.2.3.** apply to the protection of the valves.

1.10.2.3. If the cylinder contains residue of the following material, ship regulated as full cylinders, regardless of psia, unless completely cleaned and purged of residue or vapors:

1.10.2.3.1. Ammonia, Anhydrous

1.10.2.3.2. Division 2.2 with a subsidiary risk (other than division 5.1)

1.10.2.3.3. Contains a flammable or poisonous material

1.10.3. Empty Radioactive Material Packaging. Empty the contents of the packaging as far as practical and ensure:

1.10.3.1. The requirements of **A11.5.** are met.

1.10.3.2. The packaging is in unimpaired condition and is securely closed so that there will be no leakage of radioactive material under normal transportation conditions.

1.10.3.3. Internal contamination is not over 100 times the limits specified in **A3.3.7.12.**

1.10.4. Identifying Nonregulated Material, Containers or Cylinders. An item listed in **Table A4.1.** may not be regulated because it does not meet the definition of the hazard class. This includes containers or articles defined as empty according to this paragraph. In this situation, when the item is determined to be nonregulated, the shipper must alert the carrier by:

1.10.4.1. Annotating "NONHAZARDOUS" in the address block of the Military Shipment Label (MSL). In the absence of the MSL, the shipper will use an equivalent means of notification.

1.10.4.2. Ship the item as general cargo and a Shipper's Declaration for Dangerous Goods form is not required.

1.10.4.3. Apply an "EMPTY" label according to **Attachment 15**, when applicable. A label is not required for equipment or articles unless packaged, crated, or otherwise enclosed to prevent ready identification.

1.10.4.4. The "NONHAZARDOUS" entry on the MSL and the use of an "EMPTY" label is not required when the hazardous contents are completely removed from the container and there is no possibility of remaining residue, and the hazard communication markings and labels are removed or covered.

1.11. Stowing Hazardous Materials.

1.11.1. Ensure hazardous materials are compatible (**Attachment 18**) when stored in transit.

1.11.2. Ensure hazardous materials are accessible in flight.

1.11.3. Ensure hazard markings and warning labels are visible to aircrew and unloading personnel.

1.11.4. Do not stow hazardous materials susceptible to leaking on the same aircraft pallet with foodstuff, feed, or any other edible material intended for consumption by humans or animals (see **A3.2.4.**). Solid material, such as explosive articles, may be loaded on the same aircraft pallet with foodstuffs based on operational requirements.

1.11.5. Packages bearing orientation arrow (“This Way Up”) labels must be loaded, stowed and handled at all times according to label direction. Single packagings with end closures must be loaded and stowed with closures upward.

1.12. Protective Equipment. The aircraft operator will ensure appropriate equipment is available to protect aircrew and passengers when transporting materials whose vapors are toxic, irritating or corrosive. Aircraft must have a closed oxygen system or protective mask for each person aboard. The shipper will provide any required special equipment to meet unique cargo safety requirements. It is the shipper's responsibility, based on intimate knowledge of the material, to determine necessary required protective equipment. While the exact equipment required depends on the materials being transported, following are the recommended minimum (or equivalent substitutions). The base must ensure availability of protective equipment to cope with ground emergencies involving the cargo during loading operations. Coordinate respiratory and other personal protection requirements with the medical service.

1.12.1. Two pairs of rubber gloves.

1.12.2. One pair of protective gloves.

1.12.3. One plastic or rubber apron.

1.12.4. A five-pound (2.3 kg) package of incombustible absorbent material.

1.12.5. Three large plastic bags (4-mil thick, as a minimum).

1.12.6. One oxygen or protective mask for each person.

1.13. Unitized, Palletized, Overpacked, or Containerized Loads. Shippers must ensure aerial ports can handle loads. Ensure load configurations are:

1.13.1. Unitized loads will be as stable as a single container.

1.13.2. Freight containers (e.g., ISU, CONEX, MILVAN, etc.) are not considered the outer package or overpack for any item stowed inside. Items within freight containers must be packaged as prescribed in this manual. Since air movement subjects cargo to rapid acceleration and deceleration, the contents of freight containers must be adequately secured/restrained to prevent damage or breakage

from shifting. Consider both horizontal and vertical movement when securing/restraining the contents.

1.13.3. Mark and label individual packages within overpacks and freight containers according to this manual and MIL-STD-129.

1.13.4. Designed to provide installed equipment in approved holders meeting airlift restraint criteria.

1.13.5. Compatible as required by **Attachment 18**.

1.13.6. Developed not using fiberboard or plywood sideboards unless specifically required by this manual.

1.13.7. Marked and labeled on the outer most containers (overpack, bin, freight container, etc.) according to **Attachment 14** and **Attachment 15**.

1.13.8. To the greatest extent possible, place packages on aircraft pallets (e.g., 463L) and within/on freight containers, vehicles, and trailers so that markings required by **Attachment 14** and labels required by **Attachment 15** are visible.

1.13.8.1. For like items with the same classification, at least one package must have required hazard label(s) visible.

1.13.8.2. For items with different hazard classifications, at least one package for each classification must be positioned so hazard label(s) are visible.

1.13.8.3. When placement prevents hazard labels from being visible, refer to **A15.1.**

1.14. Accessibility. Do not ship hazardous material in freight containers that are not easily accessible to the aircrew during flight. Physically stow hazardous materials next to the container opening and position to allow access while on the aircraft. The aircrew must have visual and physical access to all hazardous materials to mitigate any hazard posed by an in-flight incident. If there is evidence of a leak, the crew-member can locate the hazard, determine the extent of the risk, and take appropriate action to get under control or declare an in-flight emergency. Ensure air transportation personnel have access to the contents for inspection. Provide a key to unescorted, locked containers to the aircraft commander or designated representative. Ship only the following hazardous materials in inaccessible containers or tactical shelters when properly secured:

1.14.1. Recompression vans, support vans, and shelters used by the Underwater Construction Team. Hazardous items inside these escorted containers have been identified to and approved for shipment by AFMC LSO/LOT.

1.14.2. Fire extinguishers secured in appropriate holders or brackets, or properly packaged according to this manual.

1.14.3. Vehicles, support equipment, or other mechanical apparatus. Completely drain (residual fuel not to exceed 17 oz) items fueled by a flammable liquid with a flash point at or above 38 degrees C (100 degrees F). Tightly seal fuel lines and tank to prevent residual fuel leaks. Drain and purge items fueled by a flammable liquid with a flash point below 38 degrees C (100 degrees F). Installed batteries must be nonspillable type or non-regulated and secured upright.

1.14.4. Items shipped under the PSN "Life Saving Appliances" and packaged according to this manual.

1.14.5. Air conditioners and environmental control units, magnetic material, radioactive material, and thermometers.

1.14.6. Class/division 1.4S explosives packaged according to this manual.

1.14.7. Non-flammable gases or non-flammable aerosols prepared according to this manual and packed in strong outer containers.

1.14.8. "Consumer Commodities" not containing a liquid or a flammable gas.

1.14.9. Explosives secured for air movement according to service drawings.

1.15. Procedures for Airdropping Hazardous Materials. Prepare airdrop loads according to the TO 13C7/FM 10-500 series. Prepare, mark, label, certify, and accept airdrop hazardous cargo the same as air landed cargo.

1.16. Nuclear Weapons Material. Use the detailed information and procedures for preparing nuclear weapons material in DOE-DNA TP 45-51/Army TM 39-45-51/Navy SWOP 45-51/Air Force TO 11N-45-51, *Transportation of Nuclear Weapons Material* (including supplements). This document provides a chart indicating the air shipment compatibility of nuclear material with nonnuclear explosives and hazardous materials. Also, determine the inter-compatibility of explosives and hazardous materials according to **Attachment 18**. Packaging and handling of nuclear material not specifically outlined in the above document must meet the requirements of this manual.

1.17. Air and Space Interoperability Council (ASIC) Air Standards. Member nations (Australia, Canada, New Zealand, United Kingdom, and United States) agree in Air Standards 44/9 to accept the categorization and authorization by participating nations of explosives, radioactive materials, and dangerous cargo for onward carriage in their own military aircraft. Label shipments according to the ICAO, IATA, or by nationally approved labels. Certify the shipment meets all requirements for air transport.

1.18. NATO STANAG 3854, Policies and Procedures Governing the Air Transportation of Dangerous Cargo. Participating nations agree to apply the United Nations International System for the Classification of Dangerous Cargo for air transportation. This includes the labeling (supplemented where necessary by ICAO or IATA labels) and certification. National regulations are still the authority for preparing, packing, aircraft stowing, and restraining dangerous cargo. Apply the national handling regulations of the carrier when transferring dangerous cargo from one nation to another for onward carriage.

NOTE: Paragraphs **1.17.** and **1.18.** are subject to international military standardization agreements. Do not make changes or deviations without authorization as prescribed in AFI 60-106 or NAVAIR Instruction 5711.1.

1.19. Mail Shipments. Shipment of hazardous material by mail is not permitted on military aircraft.

1.20. Transporting Foreign Troops. Transport hazardous materials belonging to non-U.S. military units using the same guidelines as for U.S. forces.

1.20.1. Comply with paragraph **3.5.** for hand-carried items

1.20.2. Ensure use of serviceable UN specification containers or packaging approved by the competent authority of the transported force. Packaged hazardous materials must be properly marked and labeled to identify the contents. Comply with **A3.3.2.8.** when transporting cylinders.

1.20.3. Equivalent foreign certification documents as approved by the competent authority of the transported force may be accepted in place of the Shipper's Declaration for Dangerous Goods form. As a minimum, the foreign certification document must include in English, the proper shipping name, UN identification number, hazard class/division and compatibility group, packing group (if required), and quantity per package of hazardous materials.

1.21. Emergency Response Information. Do not offer for transportation, accept for transportation, transfer, store, or otherwise handle hazardous materials unless emergency response information is available at all times. The shipper must provide a 24-hour emergency response telephone number that is monitored at all times by personnel who are knowledgeable of the hazards and characteristics of the materials being shipped. This information is required in the event of an emergency involving the material. See **A17.2.10.**

1.22. Use of Commercial Airlift. Use DOT special permits 7573 (DOT SP-7573) and 9232 (DOT SP-9232), as outlined in **Attachment 23**, as required for AMC contracted commercial cargo airlift

1.23. Exercises. Hazardous materials should not be air transported during an exercise solely to demonstrate movement capability when there is no planned operational use at the deployed location. When possible, inert material should be substituted for hazardous materials.

Chapter 2

DEVIATIONS, WAIVERS, AND SPECIAL REQUIREMENTS

2.1. Deviations and Waivers. Deviations and waivers are a departure from established procedures in this manual.

2.2. Passenger Movement Deviations. Do not transport passengers with hazardous materials coded as cargo aircraft only in **Table A4.1.**, column 7 and **Table A4.2.** Passenger Eligibility "P" Codes. See **Attachment 22** for deviation authority, additional passenger information, and supplemental oxygen requirements.

2.3. Packaging and Compatibility Waivers. Waivers are exceptions to the packaging or compatibility requirements of this manual. Safety and risk management of airlift assets are the overriding factors for waiver consideration. Ease of operation, convenience, or program office preference are not reasons for waiver. Service focal points will not issue waivers if surface transportation is reasonably available.

2.3.1. Packaging Waivers. The shipper must obtain a waiver for any hazardous item or packaging not authorized in **Attachment 5** through **Attachment 13**. Submit waiver requests to your Service focal point (see paragraph **1.2.2.**) by letter, message, or telephone. Confirm waivers requested by telephone with a letter or message. Ensure receipt of the letter or message prior to issuing the waiver. A copy of the waiver must accompany the shipment. The DOD does not have authority to issue packaging waivers to UN specification requirements. Do not jeopardize safety for convenience or ease of operation. To obtain a waiver, the shipper must:

2.3.1.1. Provide a detailed description of the package, including pertinent test data.

2.3.1.2. Provide the PSN, hazard class, identification number, packing group, and net quantity of the material.

2.3.1.3. Provide a detailed explanation why the established requirements can not be met.

2.3.1.4. Provide a transportation analysis identifying why surface transportation can not be effectively utilized.

2.3.2. Compatibility Waivers for Military Aircraft. A waiver is required when hazardous materials are not compatible according to **Table A18.1.** and/or **Table A18.2.** are shipped aboard the same military aircraft (see **A18.4.** for exceptions).

2.3.2.1. Shippers submit waiver requests to their Service focal point (see paragraph **1.2.2.**) for approval. For Air Force aircraft, the major command (MAJCOM) having operational control of the aircraft during the mission will be the waiver approval authority. Each service or MAJCOM will establish policy and procedures for approving compatibility waiver requests. Air Force approval authorities:

2.3.2.1.1. HQ AMC/SEW, (618) 229-0950, DSN 779-0950 (Class 1 only)

2.3.2.1.2. HQ AMC/A4TC (618) 229-4260, DSN 779-4260 (Non-Class 1 only)

2.3.2.1.3. HQ PACAF, 13 AF/POSC, COMM (808) 448-8672, DSN 315-448-8672, DSN Secure 315-449-4301

2.3.2.1.4. HQ USAFE AMOCC/XOLP, 011-49-6371-7166, DSN (314) 480-7166 (P4/P5 Local ATOC)

2.3.2.1.5. HQ ANG, (301) 836-7167, DSN 278-7167

2.3.2.1.6. HQ AFRC, (478) 327-1718, DSN 497-1718

2.3.2.2. Waiver requests must contain the following information in **2.3.2.2.1.** through **2.3.2.2.6.**:

2.3.2.2.1. Reason incompatible materials require shipment together.

2.3.2.2.2. Reason for air movement and why other transportation modes cannot be utilized.

2.3.2.2.3. Statement that if one item detonates or leaks, incompatible items (in the same container or on the same aircraft) will not cause a propagation detonation, fire, corrosive effect, or contamination of the aircraft. Provide a brief description (include tests, if performed) which support your safety conclusions. Also, provide any additional safety controls the carrier must exercise.

2.3.2.2.4. Provide intended date of movement, routing, and type of airlift required.

2.3.2.2.5. Provide national stock numbers; model numbers of explosive items; PSNs; hazard classes; identification numbers; quantity or net explosive weight (individual and total as applicable); and packaging paragraphs.

2.3.2.2.6. Provide points of contact at origin and destination bases.

2.3.3. Compatibility Waivers for AMC-Contracted (Commercial) Aircraft. Waivers are not authorized for the movement of incompatible hazardous materials on contracted commercial aircraft. Refer to **Attachment 23** for use of DOT-SP 7573 and DOT-SP 9232.

2.3.4. Operational Necessity Waivers. Variations to the requirements of this manual are authorized for a specific mission when strategic and compelling reasons exist. The Service/MAJCOM having operational control of the aircraft must approve the operating procedures for specific missions. USTRANSCOM approves operating procedures for overall program management of strategic lift assets operated by HQ AMC. This paragraph applies to the following conditions:

2.3.4.1. Recovery of downed aircraft.

2.3.4.2. Emergency rescue operations.

2.3.4.3. Movement of portable generators to support critical and key functions where power has been disrupted.

2.3.4.4. Movement of fueled support equipment (SE) to replace inoperative equipment supporting an ongoing mobility exercise or operational plan. Equipment may be transported with fuel not to exceed one-half tank.

2.3.4.5. Shipments in accordance with the requirements of AFI 11-289, *Phoenix Banner, Phoenix Silver, and Copper Operations.*

2.3.5. Intelligence or Criminal Investigations. Variations to the requirements of this manual are authorized for airlift of hazardous materials involved in intelligence or criminal investigations. Qualified personnel of those agencies responsible for the cargo must certify that all safety precautions have been taken to transport the materials safely. The shipper must ensure compliance with as many requirements of this manual as possible. This authorization is valid only for movement out of an austere envi-

ronment. At the first secure in-route airfield, the cargo must be prepared according to this manual or paragraph **2.3.1.**

2.4. DOT Special Permits. A DOT special permit is authority to deviate from the requirements of 49 CFR 100-199. Use special permits as authority for shipment by military air, if applicable. Follow all requirements of the permit.

2.4.1. The shipping activity must provide a copy of the permit for each shipment. If the approval date on the permit has expired, but a renewal has been applied for, enter, "Renewal Requested, Current Special Permit Still Valid". Place this statement on the permit after verifying renewal request with the Service Focal Point.

2.4.2. The permit must accompany the cargo in the Defense Transportation System.

2.4.3. Maintain a copy of the permit at each facility where it is used in connection with the transportation of the hazardous material.

2.4.4. Do not use DOT special permits for international shipments unless the item is exempted from UN specification requirements (see paragraph **1.7.1.**).

2.4.5. Forward requests for new permits or copies of existing permits according to the DTR, Volume II.

2.4.6. DOT Exemptions may continue to be used until their expiration date. If renewed, they will be replaced by DOT Special Permits.

2.5. Competent Authority Approvals (CAA). A CAA is an approval issued by a national agency responsible under its national law for the regulation of hazardous materials transportation. These may also be referred to as “Special Approvals.” The U.S. Competent Authority is the U.S. Department of Transportation (DOT). CAAs are used for both domestic and international shipment.

2.5.1. Packaging CAAs. A CAA may be issued for packaging or other transportation requirements when specified by the responsible national agency for the originating shipment. These include CAAs issued by the U.S. Competent Authority and foreign agencies (approval must be in English).

2.5.1.1. Use the CAA as authority for military air shipment.

2.5.1.2. Follow all requirements of the approval.

2.5.1.3. The shipping activity must provide a copy of the CAA for each shipment.

2.5.1.4. The CAA must accompany the cargo in the Defense Transportation System (attach copy to the Shipper’s Declaration for Dangerous Goods).

2.5.1.5. Request copies of existing CAAs according to the DTR, Volume II.

2.5.2. Explosive Hazard Classification CAAs/Approvals. The DOT may also issue explosive hazard classification approvals. These may also be referred to as CAAs. See paragraph **A3.3.1.4.** for applicability of DOT and foreign nation issued explosive classification approvals for military air shipments. If packaging requirements are included as part of a DOT explosive hazard classification approval, use the CAA as authority for air shipment. If there is no approval number assigned to the CAA, the shipping activity will certify the shipment to **A5.4.** and attach a copy of the approval document to the

Shipper's Declaration of Dangerous Goods (see **A17.4.1.**). Explosive hazard classification approvals without packaging instructions cannot be used as a certification reference.

2.5.3. Requests for CAAs. Follow the procedures outlined in DLAD 4145.41/AR 700-143/AFJI 24-210/NAVSUPINST 4030.55/MCO 4030.40A, *Packaging of Hazardous Material*, to request a CAA from the U.S. Competent Authority.

2.6. DOD Certification of Equivalency (COE). A COE is a certification that the proposed packaging equals or exceeds the requirements of 49 CFR 100-199. Use COEs as authority for shipment by military air, if applicable. Follow all requirements of the approval.

2.6.1. The shipping activity must provide a copy of the COE for each shipment.

2.6.2. The COE must accompany the cargo in the Defense Transportation System.

2.6.3. Do not use COEs for international shipments unless the item is exempted from UN specification requirements (see paragraph **1.7.1.**).

2.6.4. Forward requests for new COEs according to the DTR, Volume II. Request copies of existing COEs according to paragraph **1.2.2.**

2.6.5. COE issuing officials, as identified in the DTR, Volume II, follow guidance in DLAD 4145.41/AR 700-143/AFJI 24-210/NAVSUPINST 4030.55/MCO 4030.40, *Packaging of Hazardous Material*, for approving COEs. Any COE that approves military airlift of a hazardous material that is forbidden by this manual, either primary or secondary hazard, must be coordinated with the respective Service Focal Point and AFMC LSO/LOT.

2.7. Limited and Excepted Quantities. Use good quality packaging specified in **Attachment 19** to ship small quantities of hazardous materials aboard military aircraft. Personnel may use UN specification packaging even though it's not required.

2.8. Complying With Special Cargo Requirements. Ensure any Inhalation Hazard Zone A material (as identified by Special Provision 1 in **Table A4.1.**, column 7); Class 1, compatibility group K; Fissile Class III Radioactive Materials; infectious substances and biological research materials requiring a technical escort comply with the extensive protective measures outlined in **Attachment 24**.

Chapter 3

TACTICAL, CONTINGENCY, OR EMERGENCY AIRLIFT

3.1. Purpose. This chapter identifies procedural exceptions in support of the DOD, Federal agencies, and allies providing sustained, immediate, and responsive air movement, and delivery of personnel and hazardous material to, within, or from objective areas under tactical, contingency, or emergency conditions. Because of the increased risk to the aircraft; air crew; and customers, these procedural exceptions must only be used when there are validated operational requirements. This chapter does not apply to helicopters being used for insertion or extraction of combat troops to, from, or within a combat area.

3.2. Approval For Use.

3.2.1. When operational requirements are validated, the use of this chapter will be included in Operating Plans (OPlans).

3.2.2. USTRANSCOM Joint Mobility Operations Center (JMOC) approves the use of provisions of this chapter for airlift missions not identified in the OPlan. The Service/MAJCOM having operational control of the deploying unit must justify the applicability of this chapter in the airlift request.

3.2.3. Provisions of this chapter may be used for Joint Chiefs of Staff (JCS), component, and unilateral mobility exercises designed to simulate and evaluate responsiveness to tactical, contingency, or emergency situations requiring airlift when use is identified according to paragraph **3.2.1.**or paragraph **3.2.2.**

3.3. General Requirements and Restrictions.

3.3.1. **Chapter 3** approval will be included as part of airlift mission execution documentation (e.g., GDSS Form 59, Flight Advisory, etc.).

3.3.2. Comply with DOD 4500.9-R, Defense Transportation Regulation (DTR), Part III for movement of cargo and personnel during deployments. Comply with other Parts of the DTR when applicable.

3.3.3. Do not use the provisions of this chapter during redeployments unless mission readiness is affected.

3.3.4. Unless otherwise specified, comply with the packaging configurations specified in **Attachment 5** through **Attachment 13** and **Attachment 27**. Refer to **Attachment 3** for any additional requirements. Do not remove hazardous materials from their required packaging except as authorized in this chapter.

3.3.5. Refer to **Attachment 23** concerning movement of personnel with hazardous materials.

3.3.6. Observe all practical ground and flight rules and brief each aircraft commander (or representative designated by the commander) according to **Attachment 21**.

3.3.7. Do not transport hazardous cargo aboard tactical or strategic aeromedical evacuation aircraft. The field commander may allow the transportation of casualties on aircraft carrying hazardous cargo in extreme circumstances that may result in potential loss of life.

3.3.8. This chapter does not apply to contract or commercial airlift. Refer to **Attachment 23** when using DOT Special Permits for AMC contracted commercial airlift.

3.3.9. Apply these provisions to notional tasking of Standard Air Munitions Package/Standard Tank Rack Adapter and Pylon Package (STAMP/STRAPP) and deployable munitions packages, as directed by HQ AFMC/A4MW.

3.3.10. Refer to Department of Defense (DOD) Regulation 4500.9R for manifesting requirements.

3.4. Specific Operational Requirements. The following operational requirements must be validated and approved according to paragraph **3.2.**

3.4.1. Unpackaged hazardous materials (see **A5.3.**).

3.4.2. Vehicles and equipment fuel-in-tank-operational fuel levels (see **A13.4.** and **A13.5.**).

3.4.3. Incompatible items on the same aircraft (see **A18.4.**).

3.4.4. Personnel hand carrying hazardous materials (see paragraph **3.5.**).

3.5. Basic Combat Load or Individual Issue. Personnel are permitted to carry their basic combat load or individual issue of hazardous materials removed from its required packaging under the following conditions.

3.5.1. Personnel will engage an enemy force immediately upon deplaning at the objective or will be airdropped. The following requirements apply:

3.5.1.1. Personnel must not handle explosives and other hazardous materials during flight operations.

3.5.1.2. Ensure all individual hazardous materials are safe from accidental initiation (i.e., grenades in fiber containers, safety pins secured, etc.).

3.5.1.3. Ensure all small arms ammunition remain in the individual carrier (for example, bandoleers, ammunition belts, pouches), and all weapons remain clear until the aircraft has landed.

3.5.1.4. Ensure all chemical, biological, radiological, and nuclear (CBRN) equipment remains in the individual carrier (for example, protective mask bag, mobility bag), and accompany the individual at all times. First aid kit components must remain within individual kit carriers or pouches.

3.5.1.5. Prepare all hazardous material, other than small arms ammunition, CBRN equipment, and first aid kits for shipment according to this manual, consolidate in one central location on the aircraft as directed by the loadmaster, and distribute to personnel before landing.

3.5.1.6. Lithium batteries installed in electronic equipment battery box or compartment require no additional packaging. Individuals may hand carry (pockets, rucksack, backpacks, etc.) the minimum number of spare lithium batteries required to sustain the immediate operation (as determined by the troop commander). Pack hand carried lithium batteries in original wrapping or in nonconductive material to prevent external short-circuiting. Prepare equipment containing lithium batteries, not considered individual issue or basic combat, according to **A13.7.**, **A13.8.**, or **A13.9.**

3.5.1.7. The troop commander or team chief must brief the aircraft commander or designated representative (i.e. loadmaster) on the location of all hazardous materials.

3.5.1.8. Provisions of this paragraph may be used during exercises when identified in the exercise operations plan. Except for small arms ammunition, CBRN equipment, and first aid kits, items may not be shipped unpackaged unless there is intent to use explosives and other hazardous materials upon exiting the aircraft or as part of an airdrop exercise. Use and employment of unpackaged or hand carried explosives and other hazardous materials will be included in the exercise operations plan.

3.5.1.9. See **Attachment 23** for use of contract air carriers operating under DOT-SP 9232.

3.5.1.10. A Shipper's Declaration for Dangerous Goods is not required.

3.5.2. Personnel not immediately engaging the enemy force when deplaning, but will assume a tactical mission on arrival or re-deploying upon mission completion, may deploy with their basic load or individual issue of hazardous materials in accordance with paragraph **3.5.1.** However, the troop commander must collect these items, including small arms ammunition, before the anti-hijack briefing. On arrival at the aircraft, the troop commander must brief the loadmaster on the hazardous materials and assist the loadmaster, as directed, in the tie-down before departing. The hazardous materials will be redistributed on arrival at destination. If required, apply these provisions to redeployment of troops upon mission completion.

3.6. Passenger Eligibility. Participants in tactical, contingency, emergency, or deployment operations, including exercises, transported on military organic aircraft according to this chapter are not considered passengers for purposes of this manual. Refer to **Attachment 23** for contract airlift of personnel under DOT-SP 9232.

3.7. Chemically Contaminated Cargo. Decontaminate items to the greatest extent possible in the theater in which they became contaminated. Destroy reusable wood and fiberboard containers in the theater in which they became contaminated. Decontaminate reusable shipping containers other than wood and fiberboard (drums, etc.) before reusing. Double wrap palletized cargo that is susceptible to exposure to contamination. Remove the outside wrap if exposed to contamination (the inner wrap should protect the cargo). Destroy the contaminated outside wrap in the theater in which it became contaminated. Package according to **A13.20.**

Official
Donald J. Wetekam, Lt General, USAF
DCS/Logistics, Installations and Mission Support

Official
JOHN D. PRENDERGAST, Captain, SC
Deputy Commander, Fleet Logistics Operations
Naval Supply Systems Command

Official
R. S. KRAMLICH,
Lieutenant General, U.S. Marine Corps
Deputy Commandant for
Installations and Logistics

Official
BENNIE E. WILLIAMS,
Major General, USA
Director, Logistics Operations & Readiness

Official
JOLIE LAY,
Chief, Transportation Policy Division
Directorate of Force Protection and Distribution
(DALO-FPT)
HQDA G-4

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 11-289, *Phoenix Banner, Phoenix Silver, and Copper Operations*

DLAD 4145.41/AR 700-143/AFJI 24-210/NAVSUPINST 4030.55/MCO 4030.40A, *Packaging of Hazardous Materials*

DLAI 4145.21/TB MED284/NAVSUPINST 4610.31/AFJI 41-208, *Preparation of Medical Materiel Requiring Freeze or Chill Environment for Shipment*

DLAR 4145.25/AR 700-68/NAVSUPINST 4440.128B/MCO 10330.2B/AFMAN 23-227(I), *Storage and Handling of Compressed Gases and Liquid in Cylinders*

DNA TP 45-51/Army TM 39-45-51/Navy SWOP 45-51/Air Force TO 11N-45-51, *Transportation of Nuclear Weapons Material*

DOD Catalog 5010.16-c *Defense Management Education and Training*

DOD 6055.9-STD, *Explosive Safety Standards*

DOD 4500.9-R, *Defense Transportation Regulation* (DTR)

DOD 6050.5, *Hazardous Material Information Resource System* (HMIRS)

DOT Title 49 *Code of Federal Regulations* (49 CFR)

IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1"*

International Civil Aviation Organization (**ICAO**) *Technical Instructions*

International Air Transport Association (**IATA**) *Dangerous Goods Regulation*

MIL-STD-129, *Standard Practice for Military Marking for Shipment and Storage*

MIL-HDBK-1791, *Designing for Internal Aerial Delivery in Fixed Wing Aircraft*

TB 700-2, NAVSEAINST 8020.8B, TO 11A-1-47, DLAR 8220.1, *DOD Ammunition and Explosive Hazard Classification Procedures*

Title 40 CFR, Parts 260-265, *Protection of Environment*

Abbreviations and Acronyms

AFMC—Air Force Materiel Command

AFSC—Air Force Specialty Code

ALC—Air Logistics Center

ALCE—Airlift Control Element

AMC—Air Mobility Command

ASIC—Air and Space Interoperability Council

ASME—American Society of Mechanical Engineers

ASTM—American Society for Testing and Materials

ATOC—Air Terminal Operations Center

CAA—Competent Authority Approval

CBRN—Chemical, Biological, Radioactive, and Nuclear

CERCLA—Comprehensive Environmental Response, Compensation, and Liability Act

CDC—Centers for Disease Control and Prevention

CFR—Code of Federal Regulations

COE—Certification of Equivalency

CONUS—Continental United States

CRAF—Civil Reserve Air Fleet

CRR—Complete Round Rigging

DACG—Departure Airfield Control Group

DLA—Defense Logistics Agency

DMET—Defense Management Education and Training

DOD—Department of Defense

DOT—Department of Transportation

DSN—Defense Switched Network

DTS—Defense Transportation System

EOD—Explosive Ordinance Disposal

EPA—Environmental Protection Agency

ERG—Emergency Response Guidebook

FAR—Federal Acquisition Regulation

FPM—Federal Personnel Manual

FRH—Flameless Ration Heater

IAEA—International Atomic Energy Agency

IATA—International Air Transportation Association

IBD—Inhabited Building Distance

ICAO—International Civil Aviation Organization

ID—Identification

IHC—Interim Hazard Classification

IMDG—International Maritime Dangerous Goods

IRFNA—Inhibited Red Fuming Nitric Acid

ISO—International Standards Organization

ITO—Installation Transportation Officer

JCS—Joint Chiefs of Staff

KPa—Kilopascal

LSA—Low Specific Activity

MAJCOM—Major Command

MCC—Mobility Control Center

MEGC—Multiple-Element Gas Container

MILVAN—Military Van

MOS—Military Occupational Specialty

MRE—Meals Ready to Eat

MRSP—Mobility Readiness Spares Package

MSL—Military Shipping Label

MTMC—Military Traffic Management Command

NA—North American

NEW—Net Explosive Weight

N.O.S.—Not Otherwise Specified

OPlans—Operating Plans

OPR—Office of Primary Responsibility

PCB—Polychlorinated Biphenyls

PG—Packing Group

POD—Port of Debarkation

POE—Port of Embarkation

PPM—Parts Per Million

PSI—Pounds Per Square Inch

PSIA—Pounds Per Square Inch Absolute

PSIG—Pounds Per Square Inch Gauge

PSN—Proper Shipping Name

RQ—Reportable Quantity

SAAM—Special Assignment Airlift Mission

SCF—Standard Cubic Feet

SCFH—Standard Cubic Feet per Hour

SDDC—Surface Deployment and Distribution Command

SE—Support Equipment

SMPT—School of Military Packaging Technology

SPI—Special Packaging Instruction

STAMP—Standard Air Munitions Package

STRAPP—Standard Tank Rack Adapter and Pylon Package

TALCE—Tanker Airlift Control Element

TCN—Transportation Control Number

TCU—Transportation Control Unit

TMF—Traffic Management Flight

UCT—Underwater Construction Team

UN—United Nations

USACHPPM—U.S. Army Center for Health Promotion and Preventive Medicine

USG—United States Government

USTRANSCOM—United States Transportation Command

WRSK —War Readiness Spares Kit

Terms

A1—The maximum activity of special form radioactive material permitted in a type A package.

A2—The maximum activity of radioactive material, other than special form or low specific activity radioactive material, permitted in a type A package. These values are either listed in **A11.4.** or may be derived using the procedure in **A11.3.**

Activity—A measure of the quantity of radioactivity emitted by a radioisotope and is used to determine the amount of radioactive material which may be transported in various types of packaging.

Aerial Port of Debarkation (APOD)—Any airfield location where hazardous materials is received by military controlled airlift whether by channel, SAAM, airdrop, exercise, or deployment.

Aerial Port Of Embarkation (APOE)—Any airfield location where hazardous materials are entered into the Defense Transportation System IAW DOD 4500.9R, Defense Transportation Regulation, for movement by military controlled airlift whether by channel, SAAM, airdrop, exercise, or deployment.

Aerosol—Any non-refillable receptacle containing a gas compressed, liquefied, or dissolved under pressure, the sole purpose of which is to expel a nonpoisonous (other than a division 6.1 packing group III material) liquid, paste, or powder and fitted with a self-closing release device allowing the contents to be effected as solid or liquid particles in suspension in a gas, as a foam, paste, or powder, or in a liquid or gaseous state.

Article—A manufactured item, containing a hazardous material or substance, in a specific shape or design which end use is dependent on the shape or design. The shape or design prevents loss of hazardous contents during normal conditions of transport.

Atmospheric Pressure—Atmospheric pressure is 101.3kPa (14.7 psi).

Aviation Regulated Solid or Liquid—Any material which has a narcotic, noxious, or other properties such that in the event of spillage or leakage on an aircraft, extreme annoyance or discomfort could be caused to crew members so as to prevent the correct performance of assigned duties.

Bag—A flexible packaging made of paper, plastic film textiles, woven material or other similar materials.

Becquerel (Bq)—The unit of activity for radioactive material. Because this is a very small unit of measure (1 Bq = one atomic transformation per second), the standard is the larger multiple of terabecquerel (TBq). One TBq = one trillion Bq. This unit of measure is used when measuring how radioactive the item is.

Biological Product—A virus, therapeutic serum, toxin, antitoxin, vaccine, blood, blood component or derivative, allergenic product, or analogous product used in the prevention, diagnosis, treatment, or cure of diseases in humans or animals. A biological product includes a material manufactured and distributed in accordance with one of the following provisions: 9 CFR part 102 (Licenses for Biological Products); 9 CFR part 103 (Experimental Products, Distribution, and Evaluation of Biological Products Prior to Licensing); 9 CFR part 104 (Permits for Biological Products); 21 CFR part 312 (Investigational New Drug Application); 21 CFR part 314 (Applications for FDA Approval to Market a New Drug); 21 CFR parts 600 to 680 (Biologics); or 21 CFR part 812 (Investigational Device Exemptions).

Bottle—An inner packaging having a neck of relatively smaller cross section than the body and an opening capable of holding a closure for retention of the contents.

Box—A packaging with complete rectangular or polygonal faces made of metal, wood, plywood, reconstituted wood, fiberboard, plastic, or other suitable material.

Bulk Packaging—A packaging, with no intermediate form of containment, that has a maximum capacity greater than 400 kg (882 lbs) or 450 L (119 gallons).

Channel Airlift—Common user airlift service provided on a scheduled basis between two points.

Class 1 (Explosives)—Any substance or article (including a device) which is designed to function by explosion (i.e., an extremely rapid release of gas and heat). Unless the substance or article is otherwise classed in **Table A4.1.**, the term "explosive" may also refer to an item that is able to produce a chemical reaction within itself and is able to function in a similar manner even if not designed to function by explosion. Explosives in Class 1 are divided into six divisions as follows:

1. **Division 1.1**-Consists of explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.
2. **Division 1.2**-Consists of explosives that have a projection hazard but not a mass explosion hazard.
3. **Division 1.3**-Consists of explosives that have a fire hazard and a minor blast hazard or a minor projection hazard (or both), but not a mass explosion hazard.
4. **Division 1.4**-Consists of explosive devices that present a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.

5. **Division 1.5**-Consists of very insensitive explosives. This division is comprised of substances which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal transportation conditions.
6. **Division 1.6**-Consists of extremely insensitive articles that do not have a mass explosion hazard. This division is comprised of articles which contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation. The risk from these articles is limited to the explosion of a single article.

Class 2.1 (Flammable Gas)—Any material that is a gas (boiling point) at 20 degrees C (68 degrees F) or less and has a pressure of 101.3 kPa (14.7 psi), in addition to one of the following properties:

1. Is ignitable at 101.3 kPa (14.7 psi) when in a mixture of 13 percent or less by volume with air.
2. Has a flammable range of 101.3 kPa (14.7 psi) with air of at least 12 percent regardless of the lower limit.
3. The limits specified above shall be determined at 101.3 kPa (14.7 psi) of pressure and a temperature of 20 degrees C (68 degrees F) according to ASTM E681-85 Standard Test Method for Concentration Limits of Flammability of Chemicals.

Class 2.2 (Nonflammable, Nonpoisonous Compressed Gas, Including Compressed—*Gas, Liquefied Gas, Pressurized Cryogenic Gas, and Compressed Gas in Solution)*--Any material or mixture which has an absolute pressure of 280 kPa (41 psia) inside the container at 20 degrees C (68 degrees F) and does not meet the definition of a Class 2.1 or 2.3.

Class 2.3 (Gas Poisonous by Inhalation)—Any material that is a gas (boiling point) at 20 degrees C (68 degrees F) or less and has a pressure of 101.3 kPa (14.7 psi), in addition to one of the following properties:

1. The material is known to be so toxic to humans as to pose a hazard to health during transportation.
2. In the absence of adequate data on human toxicity, the material is presumed to be toxic to humans because when tested it has an LC50 (inhalation toxicity) value of not more than 5000 parts per million (ppm).

Class 3 (Flammable Liquid)—A flammable liquid is any liquid having a flash point equal to or below 60.5 degrees C (141 degrees F), except:

1. Any liquid meeting the definition of a Class 2 material.
2. Any mixture having one or more compounds with a flash point above 60.5 degrees C (141 degrees F) that makes up at least 99 percent of the total volume of the mixture. Distilled spirits of 140 proof or lower are considered to have a flash point no lower than 23 degrees C (73 degrees F).

Class 4.1 (Flammable Solids)—Flammable solids consist of solids (other than those classed as explosives) which are readily combustible under conditions encountered in transport, or may cause or contribute to fire through friction.

Class 4.2 (Spontaneously Combustible Material)—Liquids or solids which are prone to spontaneous heating under normal conditions encountered in transport or to heating in contact with air, thus being liable to ignite.

Class 4.3 (Dangerous When Wet Material)—Solids that are liable to become spontaneously flammable or emit flammable gases when they come into contact with water.

Class 5.1 (Oxidizers)—A material that may cause or enhance the combustion of other material, generally by yielding oxygen.

Class 5.2 (Organic Peroxides)—Any organic compound containing oxygen (O) in the bivalent -O-O- structure, and which may be considered a derivative of hydrogen peroxide where one or more of the hydrogen atoms have been replaced by organic radicals. Organic peroxides are thermally unstable substances which may undergo exothermic self-accelerating decomposition. These substances may be prone to explosive decomposition or rapid burning; be sensitive to impact or friction; react dangerously with other material; or cause damage to the eyes. A material which meets this definition must be classed in Class 5.2, unless it also meets the definition of a Class 1 material, or unless the available oxygen content of an organic peroxide formulation is less than the amount specified (by the percentage equation) in 49 CFR 173.128.

1. Type A: An organic peroxide that can detonate or deflagrate rapidly as packaged for transport. Transportation of type A organic peroxides is forbidden.
2. Type B: An organic peroxide that, as packaged for transport, neither detonates nor deflagrates rapidly, but can undergo a thermal explosion.
3. Type C: An organic peroxide that, as packaged for transport, neither detonates or deflagrates rapidly and cannot undergo a thermal explosion.
4. Type D: An organic peroxide which exhibits the following characteristics:

    4.1. Detonates only partially, but does not deflagrate rapidly and is not affected by heat when confined.

    4.2. Does not detonate, deflagrates slowly, and shows no violent effect if heated when confined.

    4.3. Does not detonate or deflagrate, and shows a medium effect when heated under confinement.
5. Type E: An organic peroxide that neither detonates or deflagrates, and shows low or no effect when heated under confinement.
6. Type F: An organic peroxide that will not detonate in a cavitated state, does not deflagrate, shows low or no effect if heated when confined, and has low or no explosive power.
7. Type G: An organic peroxide that will not detonate in a cavitated state, will not deflagrate, shows no effect when heated under confinement, has no explosive power, is thermally stable (self-accelerating decomposition temperature above 60 degrees C (140 degrees F)); and, for desensitized liquid formulations, is desensitized with a compatible organic liquid which boils above 150 degrees C (300 degrees F).

Class 6.1 (Poisonous Material)—A material, other than a gas, which is known to be so toxic to humans as to afford a hazard to health during transportation, or is presumed to be toxic to humans because it falls within one of the test categories identified in 49 CFR 173.132. The term “toxic” and “poisonous” are used synonymously in this manual.

Class 6.2 (Infectious Substances)—A material known to contain or suspected of containing a pathogen. A pathogen is a virus or micro-organism (including its viruses, plasmids, or other genetic elements, if any)

or a proteinaceous infectious particle (prion) that has the potential to cause disease in humans or animals. Division 6.2 materials are assigned to the following transport categories:

1. Category A – An infectious substance which is transported in a form that, when exposure to it occurs, is capable of causing permanent disability, life-threatening or fatal disease to humans or animals, and is assigned UN 2814 or UN 2900, as appropriate.
2. Category B – An infectious substance which does not meet the criteria for inclusion in Category A, and is assigned UN 3373. Formerly known as "diagnostic specimens," Category B materials are now described as "Biological Substances, Category B."

Class 7 (Radioactive Material)—Any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values in Table A.11.1.

Class 8 (Corrosive Material)—A liquid or solid that causes visible destruction or irreversible alterations in human skin tissue on contact. If the packaging leaks, the liquid will have a severe corrosion rate on other materials such as steel and aluminum. The main hazard from Class 8 liquids and vapors is the corrosive effect on humans and the aircraft or cargo. Some Class 8 materials have very dangerous additional hazards such as toxicity, flammability, and explosiveness.

Class 9 Material—A material that may pose an unreasonable risk to health, safety, or property during transport, but does not meet any of the definitions of the other hazard classes specified in this manual. This class includes:

1. A material that has an anesthetic, noxious, or other similar property which can cause extreme annoyance or discomfort to passengers and crew in the event of leakage during transportation, so as to prevent the correct performance of the crews assigned duties.
2. A material in quantities that meets the definition of a hazardous waste or a hazardous substance, but does not meet the definition of any other class.

Combination Packaging—A combination of packaging, for transport purposes, consisting of one or more inner packagings secured in a nonbulk outer packaging. It does not include a composite packaging.

Combustible Liquid—A combustible liquid is any liquid that does not meet the definition of any other classification specified in this manual and has a flash point above 60.5 degrees C (141 degrees F) and below 93 degrees C (200 degrees F). Any mixture having one or more components with a flash point of 93 degrees C (200 degrees F) or higher, that makes up at least 99 percent of the total volume of the mixture is not a combustible liquid.

Compatibility Group Letter—A designated alphabetical letter used to categorize different types of explosive substances and articles for stowage and segregation.

Complete Round Rigging (CRR)—All items, to include those normally incompatible (e.g. primers, propelling charges, projectiles, fuses, etc.), necessary to complete an end item when configured, packaged or unpackaged, on the same pallet or platform according to a Service approved technical order or publication.

Composite Packaging—Packaging consisting of an outer packaging and inner receptacle, so constructed that the inner receptacle and the outer packaging form an integral packaging. Once assembled it remains thereafter an integrated single unit; it is filled, stored, shipped, and emptied as such.

Compressed Gas in Solution—A nonliquefied compressed gas dissolved in a solvent.

Consignment—A package or group of packages or load of radioactive material offered by a person for transport in the same shipment.

Consumer Commodity—A material that is packaged and distributed in a form intended or suitable for retail sale for purposes of personal care or household use. This does not include material designed for military or industrial use that is not readily available from commercial retail sources.

Contaminated Sharps—Any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

Contamination—The presence of a radioactive substance on a surface in quantities in excess of 0.4Bq/ Cm^2 for beta and gamma emitters and low toxicity alpha emitters or 0.04Bq/cm^2 for all other alpha emitters. Contamination exists in two phases:

1. Fixed radioactive contamination means radioactive contamination that cannot be removed from a surface during normal conditions of transport.
2. Nonfixed radioactive contamination means radioactive contamination that can be removed from a surface during normal conditions of transport.

Contingency—An emergency involving military forces caused by natural disasters, terrorists, subversives, or by required military operations. Due to the uncertainty of the situation, contingencies require plans, rapid response, and special procedures to ensure the safety and readiness of personnel, installations, and equipment.

Conveyance—Any aircraft for the purposes of this manual.

Crate—An outer packaging with incomplete surfaces.

Criticality Safety Index (CSI)—A number (rounded up to the next tenth) which is used to provide control over the accumulation of packages overpacks or freight containers containing fissile material. The CSI for packages containing fissile material is determined in accordance with the instructions provided in 10 CFR 71. The CSI for an overpack, freight container, or consignment or consignment containing fissile material packages is the sum of the CSIs of all the fissile material packages contained within the overpack, freight container or consignment.

Cryogenic Liquid—A refrigerated liquefied gas having a boiling point colder than -90 degrees C (-130 degrees F) at 101.3 kPa (14.7 psi) absolute. A material meeting this definition is subject to requirements of **Attachment 6**, regardless of whether it also meets the definition of a nonflammable, nonpoisonous compressed gas. The material is partially described as "(* * *), refrigerated liquid (cryogenic liquid)" in **Table A4.1.**, (with the asterisks replaced by the name of the gas).

Cultures or Stocks—Materials prepared and maintained for growth and storage and containing a Category A or B infectious substance.

Cylinder—A pressure vessel designed for pressures higher than 40 psia and having a circular cross section.

Depleted Uranium—Uranium containing less uranium-235 than the naturally occurring distribution of uranium isotopes.

Dermal Toxicity—A material with an LD50 for acute dermal toxicity of not more than 1000 mg/kg.

Design—The description of a special form material, a package, or a packaging, that enables those items to be fully identified. The description may include specifications, engineering drawings, reports meeting regulatory requirements, and other relevant documentation.

Diagnostic Specimens—Now called “Biological Substances, Category B.” See Class 6.2 (Infectious Substances) for “Category B” definition.

Diluent Type A—An organic liquid that does not damage the thermal stability or increase the hazard of the organic peroxide and with a boiling point not less than 150 degrees C (302 degrees F) at atmospheric pressure. Type A diluents may be used for desensitizing all organic peroxides.

Diluent Type B—An organic liquid that does not damage the thermal stability or increase the hazard of the organic peroxide and with a boiling point, at atmospheric pressure, of less than 150 degrees C (302 degrees F) but at least 60 degrees C (140 degrees F), and a flash point greater than 5 degrees C (41 degrees F). Type B diluents are only used when specified in **Table A9.1.** The boiling point of a type B diluent must be at least 50 degrees C (122 degrees F) above the control temperature of the organic peroxide. A type A diluent may be substituted for a type B diluent in equal concentration.

Division—A subdivision of a hazard class.

Domestic Addressee—The continental United States, Alaska, Hawaii, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Virgin Islands, American Samoa, Guam, and other US Territories.

Drum—A flat-ended or convex-ended cylindrical packaging made of metal, fiberboard, plastic, plywood, or other suitable materials.

Emergency—An emergency operation is the movement of personnel, equipment and supplies of an organization so they can respond to a non combat (i.e. natural disaster) event requiring special and immediate action.

Enriched Uranium—Uranium containing more uranium-235 than the naturally occurring distribution of uranium isotopes.

Exclusive Use—(Also referred to in other publications as "sole use" or "full load.") The sole use of a conveyance by a single consignor for which all initial, intermediate, and final loading and unloading are carried out according to the direction of the consignor or consignee. Specific instructions for maintaining exclusive use shipment controls must be issued in writing and included with the shipping paper information provided to the carrier by the consignor.

Filling Density—Designates the percent ratio of the weight of gas in a container to the weight of water that the container will hold at 15.5 degrees C (60 degrees F) (one pound of water equals 27.737 cubic inches at 15.5 degrees C).

Fissile Material—Any material consisting of or containing one or more fissile radionuclides. Fissile radionuclides are plutonium-239, plutonium-241, uranium-233, and uranium-235. Neither natural nor depleted uranium are fissile material. Fissile materials are classified according to the controls needed to provide nuclear criticality safety during transportation, as provided in **A4.3.6.** Certain exclusions are provided in **Attachment 3**.

Flash Point—The minimum temperature at which a liquid within a test vessel gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. Flash points are determined by the testing prescribed in 49 CFR 173.120.

Freight Container—A reusable transportation conveyance designed and constructed to permit loading, lifting, and movement of consolidated air eligible packages in unit form. Includes internal slingable units (ISUs), quadruple containers (QUADCONS), military vans (MILVANS), and similar military and commercial unit load devices authorized for air transportation.

Gross Weight (Gross Mass):—

1. Weight of a vehicle, fully equipped and serviced for operation, including the weight of the fuel, lubricants, coolant, vehicle tools and spares, crew, personal equipment, and load.
2. Weight of a container or pallet including freight (contents) and binding.

Handlers—Personnel who only handle hazardous materials or hazardous materials documentation.

Hazard Class—The category of hazard assigned to a hazardous material based on defining criteria. Hazard classes are: explosives (Class 1), compressed gases (Class 2), flammable liquids (Class 3), flammable solids (Class 4), oxidizers and organic peroxides (Class 5), poisons and infectious substances (etiologic agents) (Class 6), radioactive materials (Class 7), corrosive materials (Class 8), and miscellaneous dangerous goods (Class 9).

Hazard Zone—One of four levels of hazard (hazard zones A through D) assigned to gases and one of two levels of hazard (hazard zones A and B) assigned to liquids that are poisonous by inhalation. A hazard zone is based on the LC50 value for acute inhalation toxicity of gases and vapors.

Hazardous Materials Inspectors—DOD personnel whose duties require them to review the integrity of the packaging and accuracy of documentation for all hazardous materials being transported within the Defense Transportation System (DTS) or by commercial carriers.

Hazardous Materials Preparers—DOD personnel whose duties require them to sign legally binding documentation certifying that hazardous materials are properly classified, packaged, marked and labeled, and in all respects meet the legal requirements for transportation within the DTS or by commercial carriers.

Hazardous Materials—A substance or material that is capable of posing an unreasonable risk to health, safety, and property when transported and has been so designated by this manual. May also be referred to as hazardous cargo or dangerous goods. ***NOTE:*** For identification, listing and rules pertaining to hazardous WASTE, refer to Title 40 CFR, Parts 260-265, *Protection of Environment,* established by the U.S. Environmental Protection Agency (EPA).

Hazardous Substance—A material, including its mixtures and solutions, that meets ALL of the following conditions:

1. Listed in **Table A4.3.** as originated in Appendix A to 49 CFR 172.101.
2. In a quantity, in one package, which equals or exceeds the reportable quantity (RQ) listed in **Table A4.3.**
3. When in a mixture or solution:
    3.1. For radionuclides, conforms to paragraph 6 of the appendix to 49 CFR 172.101.
    3.2. For other than radio nuclides, is in a concentration by weight which equals or exceeds the concentration corresponding to the RQ of the material shown in **Figure A1.1.**

Figure A1.1. Quantity Required To Be a Hazardous Substance Mixture or Solution.

RQ	RQ	Concentration by Weight	
Pounds	Kilograms	Percent	PPM
5,000	2270	10	100,000
1,000	454	2	20,000
100	45.4	0.2	2,000
10	4.54	0.02	200
1	0.454	0.002	20

Hazardous Waste—Any material that is subject to the hazardous waste MANIFEST requirements of the EPA specified in 40 CFR 262.

Highway Route Controlled Quantity—A quantity within a single package that is over 3,000 times the A_1 (Special Form) or A_2 (Normal Form) value of the radionuclides specified in **A11.3.**; or over 1000 TBq (27,000 Ci), whichever is least.

Inert Solid—A solid that does not damage the thermal stability or increase the hazard of the organic peroxide.

Inhalation Toxicity—

1. A dust or mist with a lethal concentration where 50 percent of the test subjects die (LC50) from acute toxicity on inhalation of not more than 10 mg/L.
2. A material with a saturated vapor concentration in air at 20 degrees C (68 degrees F) of more than one-fifth of the LC50 acute toxicity on inhalation of vapors and with an LC50 for acute toxicity on inhalation of vapors of not more than 5000 mL/m3 (5000 parts per million (PPM)).
3. An irritating material, with properties similar to tear gas which causes extreme irritation, especially in confined spaces.

Inner Packaging—Packaging for which an outer packaging is required for transport. It does not include the inner receptacle of a composite packaging.

Inner Receptacle—Receptacle which requires an outer packaging in order to perform its containment function. The inner receptacle may be an inner packaging of a combination packaging or the inner receptacle of a composite packaging.

Jerrican—A metal or plastic packaging of rectangular or polygonal cross-section.

Kit—A set of materials or articles used for a specific purpose, shipped as a single item and assigned a single National Stock Number or Part Number by the Service/Agency Item Manager. A kit may include one or more different hazardous materials. Hazardous components may or may not be compatible but may be transported together as a kit.

Limited Quantity of Radioactive Materials—A quantity of radioactive material which is not over the limits specified in **A11.5.** and conforms to the requirements specified in **A11.10.**

Liquefied Compressed Gas—A gas, which under charged pressure, is partially liquid at a temperature of 20 degrees C (68 degrees F).

Low Specific Activity (LSA) Material—Radioactive material, which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply, is termed Low Specific Activity, or LSA material. External shielding material surrounding the LSA material must not be considered in determining the estimated average specific activity. LSA material is classed in one of three groups; LSA-I, LSA-II, and LSA-III (see **Attachment 3** for more information on these groups).

Low Dispersible Material—Either a solid radioactive material or a solid radioactive material in a sealed capsule that has limited dispersibility and is not in powder form.

Magnetic Material—Any packaged material that has a magnetic field strength of 0.002 gauss or more measured at 2.1 m (7 ft) from any surface of the package.

Multiple-Element Gas Container (MEGC)—Assemblies of DOT Specification and UN approved cylinders, tubes, or bundles of cylinders, interconnected by a manifold and assembled within a framework.

Natural Thorium—Thorium with the naturally occurring distribution of thorium isotopes (essentially 100 weight percent thorium-232).

Natural Uranium—Chemically separated uranium containing the naturally occurring distribution of uranium isotopes (approximately 99.28% uranium-238 and 0.72% ranium-235 by mass).

Net Explosive Weight (NEW)—As it relates to this manual, NEW is the total weight, expressed in kilograms, of all explosive components. Refer to DOD 6055.9-STD, *Explosive Safety Standards* or Service directives for definition of NEW used to determine Quantity Distance (QD) criteria.

Net Mass—The weight of the contents in a single packaging.

Non-Bulk Packaging—A packaging that has a maximum net mass of 400 kg (882 lbs) or less and a maximum capacity of 450 L (119 gallons) or less.

Nonfixed Radioactive Contamination—Radioactive contamination that can be readily removed from a surface by wiping with an absorbent material. Nonfixed (removable) radioactive contamination is not significant if it is not over the limits specified in **A3.3.7.12.**

Nonliquefied Compressed Gas—A gas, other than gas in solution, which under charged pressure is entirely gaseous at a temperature of 20 degrees C (68 degrees F).

Normal Form Radioactive Material—Radioactive material that has not been demonstrated to qualify as "special form radioactive material."

Oral Toxicity—Liquid with a lethal dose where 50 percent of the test subjects die (LD50) from acute oral toxicity of not more than 500 mg/kg or a solid with an LD50 for acute oral toxicity of not more than 200 mg/kg.

ORM-D—For the purposes of this manual, ORM-D material, are only those materials that present a limited hazard during transportation due to their form, quantity, and packaging (e.g., Consumer Commodity). Each ORM-D material is listed in **Table A4.1.** ORM-D classification is only authorized for domestic shipments. International shipments must not be transported under the classification "ORM-D."

Other Form—(radioactive material) – Radioactive material that does not meet the definition of Special Form radioactive material.

Outage or Ullage—The amount a packaging falls short of being liquid full, usually expressed in percent by volume.

Outer Packaging—The outermost enclosure of a composite or combination packaging together with any absorbent materials, cushioning, and any other components necessary to contain and protect the inner receptacles or inner packagings.

Overpack—1) A container or enclosure used to hold one or more air eligible packages to form a single unit for convenience of handling or storage during transportation. Freight containers are not considered overpacks. 2) Placement of containers that do not meet air eligibility pressure requirements into an outer approved UN packaging.

Package—For radioactive materials, the packaging together with its radioactive contents as presented for transport.

Package or Outside Package—The packaging plus its contents.

Packaging(s)—A receptacle and any other components or materials necessary for the receptacle to perform its containment function in conformance with the minimum packing requirements of this manual. For radioactive materials, the assembly of components necessary to ensure compliance with the packaging requirements of this manual. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, and devices for cooling or absorbing mechanical shocks. The conveyance, tie down system, and auxiliary equipment may sometimes be designated as part of the packaging.

Packers—Personnel who package hazardous materials, but do not sign legally binding documents.

Packing Group—The degree of danger presented by the hazardous material.

1. Packing Group I indicates great danger.
2. Packing Group II indicates medium danger.
3. Packing Group III indicates minor danger.

Participant—Unit-move personnel directly attached to and moving with a deploying unit and their associated cargo as part of a tactical, contingency, or emergency operation or an exercise. Also, may be applied to non-channel airlift missions (e.g. Special Assignment Airlift Missions (SAAM) providing an exclusive service for movement of unit personnel and their associated cargo). Non-unit personnel are considered passengers.

Patient Specimens—Any human or animal material, including excreta, secreta, blood and its components, tissue, and tissue fluids being transported for diagnostic or investigational purposes, which have a minimal likelihood of containing pathogens in Category A or B.

Polymerizable Material—Any material that may polymerize (combine or react with itself) with an evolution of a dangerous quantity of heat or gas.

Pounds Per Square Inch (PSI)—The amount of force exerted on one square inch of the container or cylinder wall.

Pounds Per Square Inch Absolute (PSIA)—The absolute value of the force exerted on the container or cylinder wall. Absolute pressure is atmospheric pressure plus gauge pressure.

Pounds Per Square Inch Gauge (PSIG)—The gauge pressure is the pressure taken by a pressure gauge that represents the force exerted within the container or cylinder. Gauge pressure is always that pressure above atmospheric pressure.

Purged—As it relates to this manual, purged means void of hazardous material. Removal of liquid hazardous material by physical, chemical, or mechanical means as directed by a technical publication or directive. In the absence of a specific technical procedure, it is the shipper's determination based on the specific knowledge of the item to decide the appropriate preparation to ensure the item is void of hazardous material.

Primary Hazard—The hazard class of the material as assigned by **Table A4.1.**

Pyrophoric Material—This material is a liquid or solid that, even in small quantities and without an external ignition source, can ignite within five minutes of coming in contact with air. This material is the most likely to spontaneously combust.

Radiation Level—The radiation dose-equivalent rate expressed in millisievert per hour or mSv/h (millirem per hour or mrem/h). Neutron flux densities may be converted into radiation levels according to 49 CFR 173.403 (v).

Radioactive Instrument or Article—Any manufactured instrument or article such as clock, electronic tube or apparatus, or a similar instrument or article having radioactive material in gaseous or non-dispersible solid form as a component part.

Radioactive Contents—The radioactive material, together with any contaminated or activated solids, liquids or gases, within the package.

Radioactive Material—Any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values in Table A.11.1.

Receptacle—A containment vessel for receiving and holding materials, including any means of closing.

Refrigerant Gas (Dispersant Gas)—This term applies to all flammable, nonflammable, nonpoisonous refrigerant gases, dispersant gases (fluorocarbons), or mixtures listed in **Table A4.1.**; or any other compressed gas meeting one of the following conditions:

1. A nonflammable mixture containing not less than 50 percent fluorocarbon content, having a vapor pressure not over 1792 kPa (260 psig) at 54 degrees C (130 degrees F).
2. A flammable mixture containing not less than 50 percent fluorocarbon content, not over 40 percent by weight of a flammable component, having a vapor pressure not over 1792 kPa (260 psig) at 54 degrees C (130 degrees F).

Regulated Medical Waste—A waste or reusable material known to contain or suspected of containing a Category B infectious substance generated in the diagnosis, treatment, or immunization of human beings or animals; research on the diagnosis, treatment or immunization of human beings or animals; or the production or testing of biological products. Regulated medical waste containing an infectious substance in Category A must be classed as Division 6.2, described as an infectious substance, and assigned to UN 2814 or UN 2900, as appropriate.

Reportable Quantity—The quantity of material, as set forth in 40 CFR 302.4, the release of which requires notification pursuant to 40 CFR Part 302. See also “Hazardous Substance.”

Residue—The hazardous material remaining in a packaging after its contents have been removed to the maximum extent possible and before the packaging has been purged to remove any hazardous vapors.

Secondary Hazard—A distinct and separate hazardous item that is a component or integral part of a larger item that is considered the primary hazard.

Secondary Load—A distinct and separate hazardous item (other than a secondary hazard) that is loaded and transported by a vehicle or on support equipment. May also be referred to as an accompanying load.

Self-Heating Material—This material, when in contact with air and without an energy supply, is liable to self-heat.

Self-Reactive Material—At normal or elevated temperatures, this material is liable to undergo a strong exothermic reaction. Exothermic reaction can be caused by excessively high transport temperatures or by contamination.

Service Pressure—This term refers to the authorized pressure marking on the container. For example, for a cylinder marked "DOT 3A1800" the service pressure is 12410 kPa (1800 psi).

Sharps—Any object contaminated with a pathogen or that may become contaminated with a pathogen through handling or during transportation and also capable of cutting or penetrating skin or a packaging material. Sharps includes needles, syringes, scalpels, broken glass, culture slides, culture dishes, broken capillary tubes, broken rigid plastic, and exposed ends of dental wires. Sharps are assigned the proper shipping name of Regulated Medical Waste.

Shipping Activity—Unit, organization, or activity that originally offers a hazardous material into the Defense Transportation System.

Shipping Paper—The Air Cargo Manifest which includes minimum hazardous material information as required by DOD 4500.9R. In the absence of an Air Cargo Manifest, the Shipper's Declaration for Dangerous Goods form may serve as a shipping paper.

Single Packaging—Nonbulk packaging other than a combination or composite packaging.

Sievert (Sv)—The standard unit of measure for radiation dose-equivalent. It is represented by the symbol "Sv." The sievert replaces the older unit for dose-equivalent, the "rem." One Sv is equal to 100 rem.

Special Approvals—An authorization issued by the appropriate authority for transport of certain hazardous materials. These approvals may be a Department of Transportation Special Permits (DOT-SPs), Competent Authority Approval (CAA), or a Certification of Equivalency (COE).

Special Form Radioactive Material—Special form radioactive material is either an indispersible solid radioactive material or a sealed capsule containing radioactive material that meets the requirements of 49 CFR

Specific Activity of a Radionuclide—The activity of the radionuclide per unit mass of that nuclide. The specific activity of a material in which the radionuclide is essentially uniformly distributed is the activity per unit mass of the material.

Stabilized—The substance is in a condition that precludes uncontrolled reaction. This may be achieved by methods such as addition of an inhibiting chemical, degassing the substance to remove dissolved oxygen and inerting the air space in the package, or maintaining the substance under temperature control.

Strong Outer Packaging—The outermost enclosure that provides protection against the unintentional release of its contents under normal conditions of transportation, to include rough handling.

Subsidiary Risk—An additional hazardous property of a material other than the primary hazard as identified in **Table A4.1.**

Surface Contaminated Object (SCO)—Surface Contaminated Object (SCO) means a solid object which is not itself radioactive but which has radioactive material distributed on its surfaces. SCO is classified in one of two groups: SCO-I and SCO-II. See **Attachment 3** for more information.

Tactical—A tactical operation is the movement of personnel, equipment and supplies of an organization so they can accomplish their immediate military combat objective.

Technical Name—A recognized chemical name or micro biological name currently used in scientific and technical handbooks, journals, and texts. Generic descriptions are authorized provided they readily identify the general chemical or micro biological group.

Toxin—A Division 6.1 material from a plant, animal, or bacterial source. A toxin containing an infectious substance or a toxin contained in an infectious substance must be classed as Division 6.2, described as an infectious substance, and assigned to UN 2814 or UN 2900, as appropriate.

Transport Index—A single number assigned to a package, overpack, or freight container to provide control over radiation exposure.

Type A Package—A type A packaging (see definition for type A packaging) together with its limited radioactive contents. A type A package does not require competent authority approval since its contents are limited to A_1 or A_2.

Type A Packaging—A packaging designed to retain the integrity of containment and shielding required by this manual under normal conditions of transport, as demonstrated by the tests set forth in 49 CFR 173.465 or 173.466.

Type B (M) Package—A type B packaging (see definition for type B packaging), together with its radioactive contents, that for international shipments requires multilateral approval of the package design and may require approval of the conditions of shipment. Type B(M) packages are those type B package designs that have a maximum normal operating pressure of more than 7 kg/cm^2 (100 $pounds/in^2$ gauge) or a relief device that allows the release of radioactive material to the environment under the hypothetical accident conditions specified in 10 CFR part 71.

Type B (U) Package—A type B packaging (see definition for type B packaging), together with its radioactive contents, that for international shipments requires unilateral approval only of the package design and of any stowage provisions that may be necessary for heat dissipation.

Type B Package—A type B packaging (see definition for type B packaging) together with its radioactive contents is designed to transport greater than an A_1 or A_2 quantity of radioactive material.

Type B Packaging—Is a packaging designed to retain the integrity of containment and shielding required when subjected to the normal conditions of transport and hypothetical accident test conditions set forth in 10 CFR, part 71.

Uncompressed Gas—For the purposes of this manual, gas at a pressure not exceeding the ambient atmospheric pressure at the time and location the containment system is closed. All other radioactive gases are considered to be compressed.

Unirradiated Thorium—Thorium containing not more than 10^{-7} grams uranium-233 per gram of thorium-232.

Unirradiated Uranium—Uranium containing not more than 2 x 10^{3}Bq of plutonium per gram of uranium-235 , not more than 9 x 10^{6}Bq of fission products per gram of uranium-235 and more than 5 x 10^{-3} g of uranium-236 per gram of uranium-235.

Used Health Care Product—A medical, diagnostic, or research device or piece of equipment or a personal care product contaminated with potentially infectious body fluids or materials other than a Category A infectious substance.

Vehicle—Any device or conveyance used for carrying or transporting passengers, equipment, or cargo. Includes, but not limited to automobiles, trucks, motorcycles, aircraft, boats, etc.

Wetted Explosive—This material, when dry, is a Class 1 material other than those of compatibility group A. Items in compatibility group A have been wetted with sufficient water, alcohol, or plasticizer to suppress explosive properties. Wetted explosives also includes items specifically authorized by name in **Table A4.1.** or which have been assigned a PSN and hazard class by the DOT.

Attachment 2

STEPS FOR PREPARING HAZARDOUS MATERIAL

Use the following illustration as a guide for preparing hazardous materials for military air shipment.

STEP 1 -- TRAINING	1.1. Ensure you are properly trained and qualified according to paragraph **1.3.** and **Attachment 25**. 1.2. If a Preparer, ensure compliance with paragraph **1.2.4.** for authorization to certify.
STEP 2 -- IDENTIFY MATERIAL	2.1. Determine if material is hazardous and appropriate hazard classification by utilizing: 2.1.1. Hazardous Material Information Resource System (HMIRS) 2.1.2. Product Material Safety Data Sheets (MSDS) 2.1.3. Manufacturers Information 2.1.4. Joint Hazardous Classification System (JHCS) or Service Technical Directives
STEP 3 -- DETERMINE PROPER SHIPPING NAME (PSN)	3.1. See **Table A4.1.** for listing of PSNs. 3.2. Determine whether item is "forbidden." If so, the item may not be shipped via military airlift. 3.3. Also listed with PSN is the hazard class, UN number, packaging group (PG), special provisions, and packaging paragraph(s). 3.4. Determine whether a technical name is required. 3.5. Determine passenger eligibility. 3.6. Determine whether item is a "Hazardous Substance" according to **Table A4.3.**
STEP 4 -- DETERMINE REQUIREMENT FOR Chapter 3 AND NON-Chapter 3 MISSION (CHANNEL)	4.1. Non- **Chapter 3** Airlift See **Chapter 1** & **Chapter 2** for general requirements that cover all hazardous materials shipments by military airlift. **Chapter 2** covers deviations, waivers, and special requirements. 4.2. **Chapter 3** Operations, See **Chapter 3** for exceptions.

STEP 5 -- PACKAGE ITEM	5.1. Package or prepare the item for airlift. Utilize, as applicable: 5.1.1. DOD POP program 5.1.2. Special Packaging Instruction or drawing 5.1.3. Technical order, directive or field manual 5.1.4. Manufacturer or vendor packaging 5.1.5. Technical Training 5.2. If already packaged, go to step 6
STEP 6 -- VERIFY PACKAGING IS ACCEPTABLE	6.1. Review the paragraph listed in **Table A4.1.** to determine if it describes the hazardous material as packaged or prepared. 6.2. Determine whether special provisions apply. 6.3. Review **Attachment 3** to determine if package is air eligible and for general packaging requirements. 6.4. Ensure UN specification packaging requirements are met, if applicable. 6.5. Review **Attachment 19** for "Excepted" and "Limited Quantity" exceptions. 6.6. Ensure absorbent cushioning requirements found in **Attachment 20** are met, if applicable. 6.7. Determine if vehicle and equipment fuel levels are acceptable.
STEP 7 -- MARK AND LABEL PACKAGE	7.1. Mark container IAW **Attachment 14**. 7.2. Review general marking requirements. 7.3. Review hazard class specific marking requirements. 7.4. Label container IAW **Attachment 15**. Subsidiary labels are listed in column 6 of **Table A4.1.** 7.5. Review general labeling requirements. 7.6. Review handling label requirements

STEP 8 -- COMPLETE HAZARDOUS MATERIAL CERTIFICATION	8.1. Certify shipment in accordance with **Attachment 17**. 8.2. Review hazard class specific requirements. 8.3. Review exceptions for **Chapter 3** operations. 8.4. Samples of shipper's declarations are included in **Attachment 17** for reference.
STEP 9 -- COMPATIBILITY REQUIREMENTS	9.1. Ensure material is compatible IAW **Attachment 18**. 9.2. **Table A18.1.** details segregation requirements for all hazardous material 9.3. **Table A18.2.** specifies compatibility requirements for Class 1 9.4. Review exceptions for **Chapter 3** operations.
STEP 10 -- BRIEFING AGENCY REQUIREMENTS	10.1. **Attachment 21** details information required to be briefed to the aircraft commander (or designated representative)

Attachment 3

GENERAL AND HAZARD CLASS SPECIFIC AIR TRANSPORTATION REQUIREMENTS

A3.1. General Packaging Requirements. The general requirements of **Attachment 3** are in addition to the specific packaging requirements outlined in **Attachment 5** through **Attachment 13**. Hazardous material packaging must be authorized by this manual, 49 CFR Part 173, ICAO, or IATA, and meet the requirements outlined in this attachment. Specific requirements contained in a technical directive governing the packaging or preparation of an item, commodity, or article, must be complied with when stricter than requirements in this manual.

A3.1.1. Transportability. Securely close and construct containers to prevent leakage due to changes in temperature, humidity, altitude, and damage during transportation and in-transit handling. Hazardous materials must be packaged/prepared according to one of the following: DLA Performance Oriented Packaging (POP) Program, DOD Special Packaging Instruction (SPI) or an approved service drawing, technical publication (e.g., technical order/manual), manufacturer's supplied closing instructions, UN specification test report, or technical knowledge/training to construct strong outer packaging when required by this manual

A3.1.1.1. Primary and secondary items and their containers (unit or exterior) must provide protection without deformation, leakage, or rupture against:

A3.1.1.1.1. Temperature changes (-40 to 65.5 degrees C [-40 to +150 degrees F]).

A3.1.1.1.2. Pressure changes due to altitude changes (sea level to 3.7 km (12,000 feet)).

A3.1.1.1.3. Pressure changes due to explosive decompression from 3.7 to 15.24 km (12,000 to 50,000 feet).

A3.1.1.2. Do not fill a UN specification packaging to a gross mass greater than the authorized gross mass marked on the packaging.

A3.1.1.3. Provide adequate protection for material susceptible to damage by freezing during both ground and air operations.

A3.1.2. Compatibility. All containers must be designed and constructed of materials that do not react with, or are not decomposed by, the material contained therein. Plastic containers or liners must prevent permeation of contents. Plastic packaging or receptacles used for liquid hazardous materials must be capable of withstanding, without failure, the test specified in 49 CFR 173, appendix B, *Procedure for Testing Chemical Compatibility and Rate of Permeation in Plastic Packagings and Receptacles.*

A3.1.3. Ullage (Outage). Do not entirely fill containers designed to hold liquids. When filling packagings with liquid hazardous material, leave sufficient interior space (outage) to prevent leakage of contents or distortion of containers due to change of temperature during transportation, storage, and handling. For flammable liquids and other volatile liquids with a high coefficient of expansion, a minimum outage of 2 percent at 54 degrees C (130 degrees F), is required.

A3.1.4. Leak Containment (Liner) General Requirements. Leak containment must be provided for hazardous liquids when required outer packaging is not liquid-tight. This does not apply to overpacks used only for air shipment consolidation. Use a leak-proof liner, plastic bag, or other equally efficient means of containment specified in packaging or closure instructions according to **A3.1.1.**

Items drained and purged that are susceptible to leaking purging fluid (e.g. small fuel components) should also be contained in a liner to prevent leaking.

A3.1.5. Closures. Packages and containers must be closed as specified in a test report, packaging instruction, or drawing except as identified in **A28.2.2.** When used, stoppers, corks, or other such friction-type closures must be held in place securely, tightly, and effectively. Each screw-type closure on any packaging/container (other than UN specification jerricans) containing a hazardous liquid must be secured with pressure-sensitive tape, self-shrinking plastic, wire, a device designed to prevent the cap from loosening (integral locking cap), or other positive means to prevent the closure from loosening due to vibration or substantial temperature change.

A3.1.6. Inner Packaging. Pack, secure, and cushion inner packagings of combination packagings to prevent breakage or leakage and to control movement within the outer container. When partial contents are removed, fill voids to ensure a tight pack. Cushioning material must not react dangerously with the contents of the inner packagings. Inner packagings are required as specified by the applicable packaging paragraph. If inner packagings are not required, the packaging paragraph will state that inner packagings are not necessary. See **Attachment 20** for absorbent cushioning requirements.

A3.1.7. Metal Containers. Unless otherwise specified, the maximum capacity of metal drums is 208 L (55 gallons). Do not accept for shipment metal containers having corrosion or dents at the chime or seam, soldered, or welded area.

A3.1.8. Indicators. Valves and indicators (with protective caps when required), which are necessary to ensure safe transportation, must be installed in the shipping container. Examples are relief valves (vacuum or pressure), humidity indicators, or leak indicators with adequate sensitivity to alert monitor or crew of imminent danger.

A3.1.9. Polymerizable Material. Transportation of any liquid, solid, or gaseous material that may polymerize (combine or react with itself) or decompose so as to cause dangerous evolution of heat or gas under normal transportation conditions is prohibited. Such materials may be offered for transportation when properly stabilized or inhibited.

A3.1.10. Solids in a Liquid Single Packaging. A single or composite packaging which is tested and marked for liquid hazardous materials may be filled with a solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked. In addition:

A3.1.10.1. A single or composite packaging which is tested and marked for PG I liquid hazardous materials may be filled with:

A3.1.10.2. A PG II solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 1.5, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked; or

A3.1.10.3. A PG III solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 2.25, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked.

A3.1.10.4. A single or composite packaging which is tested and marked for PG II liquid hazardous materials may be filled with a PG III solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 1.5, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked.

A3.1.11. Outside Package/Container. The package or container must be of such size that there is adequate space to affix all markings and labels in a manner required by this manual (**Attachment 14** and **Attachment 15**). If necessary, use overpacks to provide adequate space.

A3.1.12. Foreign Packaging. UN standard non-bulk packaging manufactured outside the United States may be shipped by military air provided packages are marked according to **A14.2.**, when applicable, and all other requirements of this manual are complied with. Refer to **A3.3.2.8.** for shipping of foreign cylinders.

A3.1.13. Plastics Drums and Jerricans. The period of use permitted for the transport of a hazardous substances in plastics drums and jerricans is five years from the date of manufacture of the receptacles except for re-usable containers which are marked with the minimum thickness of the packaging material according to 49CFR, 173.28.

A3.2. Air-Eligible Packaging Requirements.

A3.2.1. Combination Packaging Pressure Standard. Inner packagings (including closures) used to retain a hazardous liquid or semi-solid in a combination packaging must be capable of withstanding (without leaking) an internal air gauge pressure of not less than 95 kPa (14 psi); or 75 kPa (11 psi) for Packing Group III liquids in Class 3 or Class 6.1; or a pressure related to the vapor pressure of the liquid contained in the receptacle, whichever is greater. Repack or overpack liquid hazardous materials in containers that do not meet the internal hydraulic pressure standard, into United Nations (UN) certified specification containers that meet this requirement. Determine the pressure related to the vapor pressure of the liquid by one of the following methods:

A3.2.1.1. The total gauge pressure measured in the receptacle (that is, the vapor pressure of the liquid and the partial pressure of the air, or other inert gases, less 100 kPa (15 psi) at 55 degrees C (131 degrees F), multiplied by a safety factor of 1.5. The total gauge pressure is determined on the basis of a filling temperature of 15 degrees C (59 degrees F) and a degree of filling such that the receptacle is not liquid full at a temperature of 55 degrees C (131 degrees F).

A3.2.1.2. Not less than 1.75 times the vapor pressure at 50 degrees C (122 degrees F) of the material to be transported minus 100 kPa (15 psi) but with a minimum test pressure of 100 kPa (15 psi).

A3.2.1.3. Not less than 1.5 times the vapor pressure at 55 degrees C (131 degrees F) of the material to be transported minus 100 kPa (15 psi) but with a minimum test pressure of 100 kPa (15 psi).

A3.2.2. Single and Composite Packaging Pressure Requirement. Single packagings containing liquid hazardous material must meet the hydraulic pressure test requirements of 49 CFR 178.605. A test pressure of not less than 250 kPa (36 psi) for liquids of PG I; 80 kPa (12 psi) for PG III liquids in Class 3 or Class 6.1; and 100 kPa (15 psi) for all other liquids is required. If shipping liquid hazardous materials in containers that do not meet the internal hydraulic pressure requirement, repack or overpack into UN specification certified containers that do meet the requirement.

A3.2.3. Overpacking Containers. Pack containers holding liquids that do not meet the pressure requirement for air transport into an outer container that does meet the requirement. Separate interior containers by absorbent cushioning material as required by **Attachment 20**. Do not overpack pressurized containers in sealed metal drums. See **Attachment 14** and **Attachment 15** for marking/labeling requirements and **Figure A17.1.** for certification instructions.

A3.2.4. Meals Ready to Eat (MRE). Follow the requirements of paragraph **1.11.** for stowing edible material intended for human consumption on the same aircraft pallet as hazardous material. If required by operational necessity, load MRE's on the same 463L pallet with hazardous materials under the following conditions:

A3.2.4.1. Do not load MREs or other edible material on the same pallet with any hazardous material liquid or Class/division 2.3 gases.

A3.2.4.2. Separate hazardous materials (except Class 1) from the MREs by the greatest distance possible, but not less than 44 inches in all directions.

A3.2.4.3. Do not load hazardous materials above the MRE's.

A3.2.4.4. Flameless Ration Heaters (FRH) packed as a component of the MRE, regardless of the number shipped, are not regulated by this manual (see **A3.3.4.**). Prepare FRHs shipped separately from the MRE as regulated hazardous material according to this manual.

A3.2.4.5. Do not open, handle, or activate fuel sources shipped along with the MRE's inside the aircraft.

A3.2.5. Subsidiary Risk. A packaging containing a Packing Group III material with a subsidiary risk of Class/Division 4.1, 4.2, 4.3, 5.1, or 8 must meet Packing Group II performance level.

A3.3. General Requirements Applicable to Hazard Class. In addition to **A3.1.** and **A3.2.**, the following general requirements apply to each hazard class:

A3.3.1. Class 1.

A3.3.1.1. General Handling Instructions. Class 1 materials can function by detonation or combustion. Store away from fire hazards and handle carefully.

A3.3.1.1.1. Comply with safety precautions, standards, and rules in AFMAN 91-201 (Air Force), AR 385-64 (Army) and DA PAM 385-64, and NAVSEA OP 5 (Navy) during handling, transportation and storage of explosives.

A3.3.1.1.2. Do not ship explosives that have been dropped any distance, leaking, or otherwise damaged during transportation or handling until inspected by qualified munitions/EOD personnel.

A3.3.1.1.3. Onward shipment of suspected or damaged explosives may be made provided the shipment is inspected, repacked, and certified to be in proper condition for safe transport by qualified personnel.

A3.3.1.2. Forbidden Explosives. Do not offer explosives listed below for air shipment:

A3.3.1.2.1. An explosive not approved according to **A3.3.1.4.**

A3.3.1.2.2. Bulk fulminates or other detonating compounds in dry condition.

A3.3.1.2.3. Explosive compounds that ignite spontaneously or undergo marked decomposition when subjected to a temperature of 75 degrees C (167 degrees F) for 48 hours.

A3.3.1.2.4. An explosive mixture or device containing a chlorate and also containing:

A3.3.1.2.4.1. An ammonium salt including a substituted ammonium or quaternary ammonium salt.

A3.3.1.2.4.2. An acidic substance including a salt of a weak base and a strong acid.

A3.3.1.2.5. Nitroglycerin, diethylene glycol dinitrate, or any other liquid explosives not specifically authorized by **Attachment 5**.

A3.3.1.2.6. A loaded firearm except as authorized by **Chapter 3**.

A3.3.1.2.7. Fireworks that combine an explosive and a detonator.

A3.3.1.2.8. Fireworks containing yellow or white phosphorus.

A3.3.1.2.9. A toy torpedo whose outside dimension exceeds 23 mm (0.906 in), or a toy torpedo containing a mixture of potassium chlorate, black antimony (antimony sulphide), and sulphur if the weight of the explosive material in the device exceeds 0.26 g (0.01 oz).

A3.3.1.2.10. Explosives specifically forbidden in **Table A4.1.**

A3.3.1.3. Chemical Munitions. Chemical munitions are dangerous materials that are found in a variety of forms such as artillery shells, mortar shells, spray tanks, aircraft bombs, grenades, candles, rockets, and containers of chemical agents that are not high explosives or shrapnel.

A3.3.1.3.1. Handling Chemical Ammunitions. Use maximum preferential handling. Use the same materials handling equipment for high explosive munitions that is used for chemical munitions.

A3.3.1.3.2. Reporting and Disposing of Chemical Ammunitions. Immediately report any leaking chemical munitions to the agency initiating the shipment. If the leak is due to causes other than faulty munitions construction, report according to paragraph **1.9.** Dispose of leaking or damaged chemical munitions according to applicable service directives. The report should include the following:

A3.3.1.3.2.1. Type and amount of chemical munitions.

A3.3.1.3.2.2. Lot number.

A3.3.1.3.2.3. Date discovered.

A3.3.1.3.2.4. Detailed information concerning the nature and possible cause of leak.

A3.3.1.3.2.5. Disposition or recommendation for disposition.

A3.3.1.4. Explosives Classification Approval. Explosives, explosive devices, and munitions, including commercial and foreign, to be eligible for military air transportation, must be either assigned a DOD classification or meet the provisions for transport without a DOD classification according to TB 700-2, NAVSEAINST 8020.8B, TO 11A-1-47, DLAR 8220.1, *DOD Ammunition and Explosive Hazard Classification Procedures*. All explosives indexed in the Joint Hazard Classification System (JHCS) are approved for movement by military controlled aircraft. Unless listed in the JHCS, a copy of the classification approval document must accompany the shipment. A copy is not required for 1.4S munitions. Transport explosives not listed in the JHCS only under one of the following conditions:

A3.3.1.4.1. Assigned a DOD interim hazard classification (IHC) by a DOD classification authority according to TB 700-2, NAVSEAINST 8020.8B, TO 11A-1-47, DLAR 8220.1

A3.3.1.4.2. Assigned a DOE final or interim hazard classification (IHC).

A3.3.1.4.3. Assigned a DOT-approved final hazard classification and EX number, and listed in **Table A4.1.**, Column 7 (Special Provision) as "A69".

A3.3.1.4.4. An explosive classified as 1.4S in accordance with a foreign issued CAA or Special Approval document.

A3.3.1.4.5. Foreign troop (and hazardous materials) movements according to paragraph **1.21.**

A3.3.1.4.6. Explosives and munitions transported for allied/coalition countries supporting joint operations with U.S. forces.

A3.3.1.5. Explosive Components of Airdrop Deployment Systems. Explosive components of parachutes or other airdrop deployment systems prepared or “rigged” according to technical directives, and intended for use during flight, are not governed by this manual.

A3.3.1.6. Unpackaged Explosives. Explosives must be packaged according **Attachment 5** except as identified in paragraph **3.5.**, **A5.2.**, and **A5.3.**

A3.3.1.7. Captured Ammunition and Ammunition With Unknown Characteristics. Transport this ammunition on military aircraft only under the following provisions:

A3.3.1.7.1. Explosive ordinance disposal (EOD) personnel must inspect the items and complete necessary action to make them safe for air shipment, and sign a certificate to this effect.

A3.3.1.7.2. Qualified personnel assign a hazard classification. Pack and mark according to the prescribed packaging in **Table A4.1.**, including UN performance specification packaging requirements.

A3.3.1.8. Missiles, rockets, and rocket motors may not contain liquid propellants forbidden by this manual. Shippers must provide written procedures for monitoring shipping containers equipped with leak detection indicators and also include emergency actions (to include actions necessary during flight) in the event of a leak for items containing liquid or hypergolic fuel that is corrosive and/or toxic.

A3.3.2. Class 2.

A3.3.2.1. General Handling Instructions for All Compressed Gases. The following apply:

A3.3.2.1.1. Store compressed gases in a cool, ventilated area away from fire hazards, sources of heat, ignition, or sparks.

A3.3.2.1.2. When stored in an upright position, secure cylinders to fixed supports. Compressed gas cylinders may be palletized for shipment provided the valves are protected and cylinders are adequately secured to the pallet.

A3.3.2.1.3. Exercise care when handling compressed gases. Do not drop, jar, or slide cylinders since the gas may be toxic or asphyxiating. Personnel must know the importance of handling compressed gases properly.

A3.3.2.1.4. Ensure valves are always tightly closed and protected before offering for transportation.

A3.3.2.1.5. Do not pack cylinders, spheres, or containers under pressure in metal drums or airtight outside packages.

A3.3.2.2. Cylinder Requirements. Comply with Title 49 CFR and this manual for shipping compressed gas cylinders, including safety relief devices. Requirements covering cylinders also apply to spherical pressure vessels. Reference DLAR 4145.25/AR 700-68/ NAVSUPINST 4440.128B/ MCO 10330.2B/AFMAN 23-227(I) for additional data on compressed gas cylinders.

A3.3.2.2.1. Cylinders or spherical pressure vessels must not contain gases or materials capable of combining chemically so as to endanger their serviceability. Make sure all cylinders, including closing devices and cushioning materials, are in good condition so that their contents are well protected during transit.

A3.3.2.2.2. Close each cylinder containing poisonous materials with a plug or valve meeting the following requirements:

A3.3.2.2.3. Each plug or valve must have a taper-threaded connection directly to the cylinder and be capable of withstanding the test pressure of the cylinder.

A3.3.2.2.4. Each valve must be of the packless type with nonperforated diaphragm, except that for corrosive materials, the valve may be of the packed type, provided the assembly is made gas-tight by means of a seal cap with gasketed joint attached to the valve body of the cylinder to prevent loss of material through or past the packing.

A3.3.2.2.5. Each valve outlet must be sealed by a threaded cap or threaded solid plug.

A3.3.2.2.6. Cylinders, valves, plugs, outlet caps, luting, and gaskets must be compatible with each other and with the material.

A3.3.2.3. Valve Protection. Protect all valves of containers charged with compressed gas by one of the following methods:

A3.3.2.3.1. By a securely attached metal cap of sufficient strength to protect the valve from injury during transit.

A3.3.2.3.2. By boxing or crating the cylinder or sphere to give proper protection to the valve. The outer packaging must be capable of meeting drop tests specified for Packing Group I.

A3.3.2.3.3. By recessed valve or otherwise protected valve so that it cannot be subjected to a blow when the container is dropped on a flat surface.

A3.3.2.3.4. By valves strong enough to avoid injury during transit for cylinders or spheres containing nonliquefied gas under pressure not over 2068.5 kPa (300 psig) at 21 degrees C (70 degrees F).

A3.3.2.3.5. The cylinder or vessel is secured as an attached component of a vehicle, equipment, trailer, or cart in a manner that will prevent damage to the valve during transit.

A3.3.2.4. Cylinders Containing Poisonous Material. Overpack cylinders containing a poisonous material, which have a wall thickness at any point of less than 2.03 mm (0.080 inch) and do not have fitted value protection, in a 4C1, 4D, 4F, 4G, 4H1, or 4H2 box. The box must meet the requirements of A3.1. Ensure box and valve protection is of sufficient strength to protect all parts of the cylinder and valve (if it has a valve) from deformation and breakage resulting from a drop of 2.0 m (7 ft) or more onto a concrete floor, impacting at an orientation most likely to cause damage. If the cylinder is not overpacked, equip the cylinder with a protective cap or other means of valve protection sufficient to protect the valve from deformation and breakage resulting from a

drop of 2.0 m (7 ft) or more onto a concrete floor, impacting at an orientation most likely to cause damage.

A3.3.2.5. Cylinders Requiring an Outer Packaging. Ship DOT 2P, 2Q, 3E, 3HT, 4BA spherical type, 4D, 4DA, 4DS, 9, 39, 40, and 41 cylinders in strong outer packaging. Ensure the package is capable of protecting the cylinder and all its parts from deformation or breakage resulting from a 1.2 m (4 foot) drop on a solid concrete floor. DOT 4BA spherical cylinders may be securely mounted on warehouse pallets to provide protection for the spheres and any attachments.

A3.3.2.6. Pressure and Filling Requirements.

A3.3.2.6.1. Ensure the pressure in the container at 21 degrees C (70 degrees F) is not more than the service pressure for which the container is marked or designated, except as provided below.

A3.3.2.6.2. When cylinders with a marked pressure limit are prescribed, other cylinders made under the same specification, but with a higher marked service pressure limit are authorized. For example, a cylinder marked DOT 4B500 may be used where DOT 4B300 is specified.

A3.3.2.6.3. The pressure in the cylinder or sphere at 54 degrees C (130 degrees F) must not exceed 1 1/4 times the service pressure except cylinders of acetylene, liquefied nitrous oxide, and liquefied carbon dioxide which must not exceed the allowable charging pressure of the cylinder.

A3.3.2.6.4. The pressure of a cylinder containing a poisonous material must not exceed the service pressure of the cylinder at 55 degrees C (131 degrees F). Provide sufficient outage to ensure the cylinder is not liquid full at 55 degrees C (131 degrees F).

A3.3.2.6.5. Use the service pressure identified for a current specification for containers made before the effective date of specifications.

A3.3.2.6.6. Except for carbon dioxide, nitrous oxide, and vinyl fluoride, stabilized, the liquid portion of the gas (if any) must not completely fill the cylinder at 54 degrees C (130 degrees F). The liquid portion of vinyl fluoride, stabilized, may completely fill the cylinder provided the pressure is not over 1 1/4 times the service pressure (see definition for filling density).

A3.3.2.6.7. Use the service pressure identified in **Figure A3.1.** for authorized cylinders not marked with a service pressure.

A3.3.2.6.8. DOT 3A, 3AX, 3AA, 3AAX, and 3T cylinders may be charged with compressed gases other than liquefied, dissolved, poisonous, or flammable gases to a pressure of 10 percent over their marked service pressure, provided the following conditions are met:

A3.3.2.6.8.1. Equip each cylinder with frangible disc safety devices (without fusible metal backing) having a bursting pressure not over the minimum prescribed test pressure.

A3.3.2.6.8.2. Determine the elastic expansion at the time of the last test or retest by the water-jacket method.

A3.3.2.6.8.3. Do not exceed either the average wall stress or the maximum wall stress limitations in **Figure A3.2.**

A3.3.2.6.9. Use **Figure A3.3.** for filling density requirements of Liquefied Petroleum Gases. Any filling density prescribed in **Figure A3.3.** may be increased by 2 percent for liquefied

petroleum gas in DOT 26 or DOT 3 cylinders (or in DOT 3A cylinders marked for 1,800 pounds or higher service pressure, subject to the bullet above).

A3.3.2.6.10. Use **Figure A3.4.** for filling density requirements when shipping cryogenic liquids of argon, helium, neon, nitrogen, and oxygen. Ship hydrogen (minimum 95 percent parahydrogen) according to **Figure A3.5.**

Figure A3.1. Cylinder Specification and Service Pressures.

Specification Marking	Service Pressure Kilopascal (Pounds Per Square Inch)	
DOT-3	12411.0	(1800)
DOT-3E	12411.0	(1800)
DOT-4	2068.5	(300)
DOT-8	1723.8	(250)
DOT-9	1379.0	(200)
DOT-25	2068.5	(300)
DOT-33	3309.6	(480)
DOT-38	1723.8	(250)
DOT-40	1379.0	(200)
DOT-41	1654.8	(240)

Figure A3.2. Wall-Stress Limitations.

Type of Steel	Wall Stress Average	Limitation Maximum
Plain carbon steels over 0.35 carbon and medium manganese steels.	53,000	58,000
Steels of analysis and heat treatment specified in DOT Specification 3AA.	67,000	73,000
Plain carbon steels less than 0.35 carbon made before 1920.	45,000	48,000

Figure A3.3. Prescribed Filling Density for Liquefied Petroleum Gas.

Minimum Specific Gravity of the Liquid Material at 60 degrees F (15.5 degrees C)	Maximum Filling Density in Percent of the Water Capacity of the Container	Minimum Specific Gravity of the Liquid Material at 60 degrees F (15.5 degrees C)	Maximum Filling Density in Percent of the Water Capacity of the Container
0.271-0.289	26	0.504-0.510	42
0.290-0.306	27	0.511-0.519	43
0.307-0.322	28	0.520-0.527	44
0.323-0.338	29	0.528-0.536	45
0.339-0.354	30	0.537-0.544	46
0.355-0.371	31	0.545-0.552	47
0.372-0.398	32	0.553-0.560	48
0.399-0.425	33	0.561-0.568	49
0.426-0.440	34	0.569-0.576	50
0.441-0.452	35	0.577-0.584	51
0.453-0.462	36	0.585-0.592	52
0.463-0.472	37	0.593-0.600	53
0.473-0.480	38	0.601-0.608	54
0.481-0.488	39	0.609-0.617	55
0.489-0.495	40	0.618-0.626	56
0.496-0.503	41	0.627-0.634	57

Figure A3.4. Filling Density for Cryogenic Liquids Except Hydrogen.

Pressure control valve setting (maximum start-to-discharge pressure, kPa (psig.)	**Maximum permitted filling density (percent by weight)**					
	Air	**Argon**	**Nitrogen**	**Oxygen**	**Helium**	**Neon**
310.3 (45)	82.5	133	76	108	12.5	109
517 (75)	80.3	130	74	105	12.5	104
724 (105)	78.4	127	72	103	12.5	100
1172 (170)	76.2	122	70	100	12.5	92
1585.8 (230)	75.1	119	69	98	12.5	85
2034 (295)	73.3	115	68	96	12.5	77
2482 (360)	70.7	113	65	93	12.5	
3103 (450)	65.9	111	61	91	12.5	
3723 (540)	62.9	107	58	88	12.5	
4309 (625)	60.1	104	55	86	12.5	
Design Service Temperature (degrees F)	-320	-320	-320	-320	-452	-411
(degrees C)	-196	-196	-196	-196	-269	-246

Figure A3.5. Filling Density for Cryogenic Liquids of Hydrogen.

Column 1	**Column 2**
Design service temperature	Minus 253 degrees C (-423 degrees F) or colder
Maximum permitted filling density, based on cylinder capacity at -253 degrees C (-423 degrees F)(see note)	6.7 percent
The pressure control valve must be designed and set to limit the pressure in the cylinder to not more than	117 kPa (17 psig)

NOTE: The filling density for hydrogen, cryogenic liquid, is defined as the percent ratio of the weight of lading in a package to the weight of water that the packaging will hold at -253 degrees C (-423 degrees F). The volume of the packaging at -253 degrees C (-423 degrees F) is determined in cubic inches. The volume is converted to pounds of water (1 pound of water = 27.737 cubic inches). Each cylinder must be constructed, insulated, and maintained so that the total rate of venting must not be over 30 standard cubic feet (SCF) of hydrogen per hour during transportation.

A3.3.2.7. Mandatory Color-Code Identification. Exact color-code identification of any material contained in a compressed gas cylinder is mandatory for DOD and DLA owned cylinders and must meet MIL-STD-101.

A3.3.2.8. Non-DOT Specification Cylinders. The following non-DOT specification cylinders may be transported by military airlift

A3.3.2.8.1. UN Specification cylinders marked with "USA" as country of approval.

A3.3.2.8.2. Foreign cylinder (other than UN cylinders) manufactured, inspected, and tested according to 49 CFR, Part 178, or a copy of the competent authority approval of the nation manufacturing the cylinder accompanies the shipment. All other requirements of this manual also apply.

A3.3.2.8.3. Cylinders issued a DOT Special Permit or Exemption.

A3.3.2.8.4. Cylinders marked with the prefix "ICC" (i.e. ICC-4BA240) are authorized in place of cylinders required by this manual with a "DOT" prefix. The cylinders must comply with all other applicable specification requirements for DOT cylinders.

A3.3.2.9. Unregulated Compressed Gases. Compressed gasses in the following items are not regulated:

A3.3.2.9.1. Inflated tires, when inflated to a pressure not greater than its rated inflation pressure.

A3.3.2.9.2. Inflated balls used for sports.

A3.3.2.9.3. Aerosols, containing non-flammable gas, with capacity of 50 ml or less.

A3.3.2.9.4. Carbonated beverages.

A3.3.2.9.5. Refrigerating machines, including dehumidifiers, air conditioners, and components thereof such as precharged tubing containing 12 kg (25 pounds) or less of nonflammable liquefied gas.

A3.3.2.9.6. Shipping containers pressurized according to a technical directive with a non-flammable gas which has an absolute pressure of 40 psia or less inside the container at 20 degrees C (68 degrees F).

A3.3.2.9.7. Cylinders considered empty according to paragraph **1.10.2.**

A3.3.2.9.8. Accumulators. Articles containing a non-flammable or non-toxic gas intended to function as shock absorbers that are manufactured to industry quality assurance standards; has a gas space capacity less than 1.6 L and a charge pressure not more than 280 bar where product of capacity (liters) and a charge pressure is not more than 80 (e.g. 0.5 L gas space and 160 bar charge pressure = 80); has a minimum burst pressure of 4 times the charge pressure at 20 degrees C, manufactured from a material which will not fragment; and when subject to fire is protected from rupture by degradable seal or pressure release device.

A3.3.2.10. Mounted Cylinders and Fire Extinguishers. Cylinders, other than those identified in **A3.3.2.5.**, containing non-flammable gases (e.g., oxygen, air, nitrogen) and fire extinguishers may be shipped secured in holders of equipment and protected from possible accidental damage with safety pin/clip installed. Fire extinguishers not in an approved holder must be packaged according to **A6.7.**

A3.3.2.11. Aircraft Fire Suppression Bottles. Use description “Liquefied Gases, UN 1058”; “Compressed Gas, N.O.S., UN 1956”; or the hazard classification assigned by the manufacturer for DOT specification 3HT, 4D, 4DA, or 4DS. See paragraph **A6.4.1.** and **Table A6.1.**

A3.3.2.12. Bulk Compressed Gas Tanks. Bulk compressed gas tanks must meet applicable cylinder specification requirements identified in **Attachment 6**, or be certified to a Competent Authority Approval (CAA), Certification of Equivalency (COE), or a DOT Special Permit (DOT-SP). If not certified to the above, the tank must be drained, purged, or otherwise considered empty. Use paragraph **1.10.** to identify "empty" tanks.

A3.3.2.13. Vehicle Fire Suppression Systems. Cylinders and pressure vessels which are an integral part of a vehicle fire suppression system and exceed 40 pounds per square inch absolute (psia) at 21 degrees C (70 degrees F) must be identified as a secondary hazard according to **A17.4.2.2.**

A3.3.2.14. Multiple-Element Gas Container. DOT Specification and UN approved cylinders may be interconnected by a manifold in accordance with 49 CFR 178.74 and 178.75, provided all valves are securely closed.

A3.3.3. Class 3.

A3.3.3.1. General Handling Instructions. Store flammable liquids in cool, well-ventilated areas. Do not store near sources of heat, flames, sparks, combustible materials, or oxidizing agents. Keep containers tightly closed to prevent the evaporation of flammable liquids. Although classed as a flammable liquid, some materials in this attachment may also be described as corrosive or toxic. In the event of leakage or spillage, use rubber gloves, goggles, aprons, and respirators.

A3.3.3.2. Combustible Liquids. The requirements in this manual do not apply to materials classed as combustible liquids, unless specifically mentioned. Use the same fuel level requirements specified in **Attachment 13** for flammable liquids when a combustible liquid is used as fuel for a vehicle, self-propelled item, or support equipment.

A3.3.3.3. Pads and Swabs. Pads, swabs, rags, and similar items soaked with a flammable liquid and sealed in a bag are not subject to the requirements of this manual provided there is no free liquid and each bag or packet contains no more than 10 ml of a flammable liquid in PG II or PG III. If a bag or packet contains an item(s) soaked with PG I flammable liquid or soaked with more than 10 ml of a PG II or PG III flammable liquid refer to requirements for "Solids Containing Flammable Liquids, N.O.S.," UN3175.

A3.3.3.4. Alcoholic Beverages. Alcoholic beverages in packagings of five liters or less are not subject to the requirements of this manual.

A3.3.3.5. Fuel for Vehicles and Equipment. Transport fuel needed to operate vehicles and equipment at the deployment site in air-eligible UN specification containers listed in paragraph **A7.2.** If required, stow these containers in the vehicle or equipment according to paragraph **1.11.** The following applies when using jerricans:

A3.3.3.5.1. Allow sufficient ullage (outage) and tightly secure jerrican caps to prevent leakage.

A3.3.3.5.2. Secure jerricans in permanently configured and approved holders on vehicles or equipment. If secured in this manner, they may be considered a secondary hazard, and included in Key 19 of the Shipper's Declaration of Dangerous Goods (see **A17.4.3.**).

A3.3.3.5.3. DOT 5L jerricans are not authorized for air shipment of fuel, and must be drained to the greatest extent possible..

A3.3.3.5.4. UN specification jerricans (not in an approved holder) may be shipped palletized, loaded and secured on a vehicle, or floor loaded. Prepare a separate Shipper's Declaration of Dangerous Goods according to **Attachment 17**.

A3.3.3.5.5. Prevent metal-to-metal contact by using cushioning material or fiberboard.

A3.3.3.6. Fuel-in-Tank Limitations. Limit fuel in vehicles, self-propelled units, wheeled engine-powered support equipment, and all other types of support equipment according to paragraph **1.8.** Units transported under the provisions of **Chapter 3** may contain additional quantities of fuel in tank according to **Attachment 13**, paragraphs **A13.4.** and **A13.5.**, based on operational necessity. During redeployments, unless mission readiness is affected, limit fuel in tank to a minimum. See **Attachment 17** for certification requirements.

A3.3.3.7. Bulk Fuel. Do not transport servicing trucks, trailers, semitrailers, or storage tanks containing bulk fuel, or any bulk hazardous material by air (except as authorized in paragraph **A7.2.15.**). The following draining/purging requirements apply:

A3.3.3.7.1. Purge bulk tanks for all liquids with a flash point below 38 degrees C (100 degrees F), regardless of whether the technical manual only requires draining.

A3.3.3.7.2. Drain, but need not purge, liquids with a flash point at or above 38 degrees C (100 degrees F), unless the technical manual specifically requires purging.

A3.3.3.7.3. Provide air circulation in the cargo compartment of pressurized aircraft.

A3.3.3.8. Equipment Fuel Leakers. The shipper is responsible for ensuring the maximum allowable fuel-in-tank is not exceeded, the amount of fuel is necessary to meet operational requirements for mission readiness, and the equipment is prepared properly to prevent leakage. Measure the fuel quantity on a level surface. The following items are considered fuel leakers and must be drained of fuel.

A3.3.3.8.1. MC-1A and MC-2A compressors. The MC-1A model 2MC-1A, T.O. 34Y1-56-71, CAGE 16004, part number 66950, NSN 4310-01-060-0642 is not considered a leaker and may be shipped with fuel-in-tank according to **Chapter 3**. Identify the item nomenclature on the Shipper's Declaration form as "2MC-1A". Units must stencil "2MC-1A' on the item.

A3.3.3.8.2. MA-3 air conditioner.

A3.3.3.8.3. H-1 heater.

A3.3.3.8.4. The USCSMK Boston Whaler boat. The United States Navy Patrol Boat Light (PBL) is not considered a leaker and may be shipped with fuel-in-tank as authorized according to this manual.

A3.3.3.8.5. The USMC River Assault Craft (RAC).

A3.3.3.8.6. All commercial support equipment.

A3.3.4. Class 4.

A3.3.4.1. General Handling Instructions. Class/Division 4.1 material containing self-reactive substances must be protected from direct sunlight and stored in a cool and well-ventilated location, away from all sources of heat. Do not store near corrosives (Class 8). Tightly and securely close all containers. These items may be water reactive and spontaneously combustible. Do not pack

Class 4 material in the same outer packaging with corrosive liquids, unless the corrosive liquids are in bottles cushioned by incombustible, non-reactive absorbent material. Place the cushioned bottles in tightly closed metal containers. Material in quantities not over 118 ml (4 ounces) in securely closed metal cans can be packed for military air transport in the same compartment with other securely packed materials necessary for a complete fumigant.

A3.3.4.2. Packaging. Unless otherwise specified by a packaging paragraph, package a material identified as PG III in **Table A4.1.** in a container that meets the PG I or II performance level.

A3.3.4.3. Flameless Ration Heaters (FRH). FRH packaged as a component of meals-ready-to-eat are not subject to the requirements of this manual (see paragraph **A3.2.4.4.**).

A3.3.4.4. Charcoal Briquettes. Lump charcoal briquettes, packaged in a form suitable for consumer use, generally will not meet the classifying criteria of a Class 4.2 spontaneously combustible material. If the charcoal briquettes do not meet the definition of a Class 4.2 material, it is not subject to any other requirements of this manual. Ensure the specific type and form of charcoal being shipped does not meet the definition of a Class 4.2 material and passed the self-heating test for carbon (which indicates that it is not spontaneously combustible).

A3.3.4.5. Fusee. The PSN "FUSEE" is only valid for domestic movement. For international shipment you must use the PSN "SIGNAL DEVICES, HAND" and package the material as required by the packaging paragraph for signal devices, hand.

A3.3.5. Class 5.

A3.3.5.1. General Handling Instructions. Organic Peroxides must be protected from direct sunlight and stored in a cool and well-ventilated location, away from all sources of heat.

A3.3.5.2. Packed with Other Materials. Do not pack Class 5 materials in the same outer packaging with corrosive liquids, unless the corrosive liquids are in bottles cushioned by incombustible absorbent material in tightly closed metal containers. Class 5 materials in securely closed metal cans and in quantities not over 118 ml (4 ounces), are acceptable for air shipment if packed in the same compartment with other securely packed materials necessary for a complete fumigant.

A3.3.5.3. Packaging. Unless otherwise specified by a packaging paragraph, package a material identified as PG III in **Table A4.1.** in a container that meets the PG I or II performance level.

A3.3.5.4. Control and Emergency Temperature. Packaged items in Class 5.2 may require controlled temperature conditions during shipment. **Table A9.1.** lists the "control temperatures" for specific organic peroxide items (by technical name), when applicable, in column 8. The following applies:

A3.3.5.4.1. The control temperature is the temperature above which a material may not be offered for transportation.

A3.3.5.4.2. The emergency temperature is the temperature at which emergency procedures must be initiated due to imminent danger resulting from overheating of the shipment.

A3.3.5.4.3. Guidance for packaging materiel requiring temperature control during shipment is contained in DLAI 4145.21/TB MED284/NAVSUPINST 4610.31/ AFJI 41-208, *Preparation of Medical Materiel Requiring Freeze or Chill Environment for Shipment.*

A3.3.6. Class 6.

A3.3.6.1. General Handling Instructions.

A3.3.6.1.1. Toxic material can react through the skin, respiratory tract, or gastrointestinal tract. In general, solid toxic material that is improperly packaged will present an ingestion hazard. Dust and mists result primarily in an inhalation hazard. Liquids may be ingested, inhaled as a vapor, or absorbed through the skin.

A3.3.6.1.2. Keep cool and away from direct rays of the sun and high temperature. Store away from sources of ignition and fire hazards. Avoid direct contact with the material. Storage areas must be plainly marked with the appropriate placards.

A3.3.6.1.3. Keep away from oxidizing materials.

A3.3.6.1.4. Make sure personnel exposed to leaking materials wear a protective mask or self-contained breathing apparatus (specific recommendations can be obtained from the medical services.)

A3.3.6.1.5. Store away from acids or acid fumes.

A3.3.6.1.6. Do not place any liquid toxic material on the same 463L pallet with foodstuffs or rations.

A3.3.6.2. General Requirements.

A3.3.6.2.1. Medical or Clinical Waste containing Category A infectious substances or containing Category B infectious substances (in cultures) shall be assigned to UN2814 or UN2900 as appropriate.

A3.3.6.2.2. Medical or Clinical Waste containing (or has a probability of containing) infectious substances in Category B, other than cultures, shall be assigned to UN3291.

A3.3.6.2.3. Category B infectious substances in cultures shall be assigned to UN2814 or UN2900 as appropriate.

A3.3.6.2.4. Category B infectious substances, other than cultures, shall be assigned to UN3373 and are excepted from all other requirements of this manual provided:

A3.3.6.2.4.1. The package is marked “Biological Substance, Category B.” Marking must be at least 6mm.

A3.3.6.2.4.2. “UN3373” is contained within a white square-on-point label displayed on the outer packaging on a background of a contrasting color.

A3.3.6.2.4.3. The completed package meets the requirements of **A10.9.**

A3.3.6.2.5. Biological products known or reasonably believed to contain infectious substances that meet the criteria for inclusion in Category A or Category B shall be assigned to UN2814, UN2900, or UN3373, as appropriate.

A3.3.6.2.6. Small quantities of Class 3, Class 8, Class 9 or other material in Packing Group II or III not exceeding 30 ml or 30g per inner packaging, and 4L or 4kg per outer package, may be used to stabilize or prevent degradation of the sample. Such preservatives are not subject to requirements of this manual.

A3.3.6.3. Unregulated Infectious Material. The following are not regulated by this manual.

A3.3.6.3.1. Live animals infected or injected with an infectious substance or biological product provided they are accompanied by technically qualified escorts.

A3.3.6.3.2. Blood or blood components which have been collected for the purposes of transfusion or for the preparation of blood products to be used for transfusion or transplantation and any tissues or organs intended for use in transplantation.

A3.3.6.3.3. Biological products manufactured and packaged in accordance with the requirements of the appropriate national authorities and transported for the purposes of final packaging or distribution, and used for personal health care by medical professionals or individuals.

A3.3.6.3.4. Medical, biomedical, or clinical waste not containing a Category A or B infectious substance unless they meet the criteria of another hazard.

A3.3.6.3.5. Patient/diagnostic specimens not containing a Category A or B infectious substance.

A3.3.6.3.6. Used health care products meeting the requirements of Title 49 CFR, 173.134(b).

A3.3.7. Class 7.

A3.3.7.1. General Handling Instructions. Handle radioactive material carefully to ensure there is no contamination of personnel or the transport vehicle. A person may not remain unnecessarily in the immediate vicinity of any package containing radioactive material.

A3.3.7.2. Nomenclature. Radioactive materials are grouped according to their form and/or characteristics. A radioactive material may meet the definition of one or more of these groups. These groups include:

A3.3.7.2.1. Special Form.

A3.3.7.2.2. Low Specific Activity (LSA).

A3.3.7.2.3. Surface Contaminated Object (SCO).

A3.3.7.2.4. Fissile.

A3.3.7.2.5. Low dispersible radioactive material.

A3.3.7.2.6. Other form.

A3.3.7.3. Special Form.

A3.3.7.3.1. Design Requirements. Special Form radioactive material must meet all requirements in 49 CFR 173.403 and 173.469.

A3.3.7.3.2. Approval of Special Form Radioactive Material.

A3.3.7.3.2.1. Each shipper of special form radioactive materials must maintain on file for at least 1 year after the latest shipment, a complete safety analysis, including documentation of any tests demonstrating that the special form material meets the requirements of 49 CFR 173.476. An International Atomic Energy Agency (IAEA) certificate of competent authority issued for the special form material may be used to satisfy this requirement.

A3.3.7.3.2.2. Before the first export shipment of a special form radioactive material from the United States, each shipper must obtain a competent authority certificate for the specific material. For special form material manufactured outside the United States an IAEA

certificate of component authority from the country of origin may be used to meet this requirement. For special form materials manufactured in the United States each shipper must obtain a US competent authority certificate for the specific material. Submit each petition for a US competent authority certificate according to 49 CFR 173.476 and include the following information:

A3.3.7.3.2.2.1. A detailed description of the material or, if a capsule, a detailed description of the contents. Make a particular reference to both physical and chemical states.

A3.3.7.3.2.2.2. If a capsule is used, a detailed statement of its design and dimensions, including complete engineering drawings and schedules of material, and methods of construction.

A3.3.7.3.2.2.3. A statement of tests performed and their results; evidence based on calculative methods to show that the material is able to pass the tests; or other evidence that the special form radioactive material complies with 49 CFR 173.469.

A3.3.7.3.2.3. The documentation requirements specified in the bullets above do not apply in those cases where A_1 equals A_2 and the material is not described on the shipping papers as "Radioactive Material, Special Form, N.O.S."

A3.3.7.4. Low Specific Activity (LSA) Material. LSA material is classified in one of three groups:

A3.3.7.4.1. LSA-I. LSA-I material is:

A3.3.7.4.1.1. Uranium and thorium ores and concentrates of such ores, and other ores containing naturally occurring radionuclides which are intended to be processed for the use of these radionuclides.

A3.3.7.4.1.2. Solid, unirradiated natural uranium or depleted uranium or natural thorium or their solid or liquid compounds or mixtures.

A3.3.7.4.1.3. Radioactive material, for which the A_2 value is unlimited, other than fissile material in quantities not excepted under **A3.3.7.6.2.**

A3.3.7.4.1.4. Other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the values for activity concentration specified in **A11.3.**, excluding fissile material in quantities not excepted under **A3.3.7.6.2.**

A3.3.7.4.2. LSA-II. LSA material is:

A3.3.7.4.2.1. Water with tritium concentration up to 0.8 TBq/L.

A3.3.7.4.2.2. Other material in which the activity is distributed throughout and the estimated average specific activity does not exceed

10^{-4} A_2/g for solids and gases, and 10^{-5} A_2/g for liquids.

A3.3.7.4.3. LSA-III. LSA-III material is a solid (e.g., consolidated wastes, activated materials), excluding powders, in which:

A3.3.7.4.3.1. The radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.)

A3.3.7.4.3.2. The radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble material, so that even under loss of packaging, the loss of radioactive material per package by leaching, when placed in water for 7 days, would not exceed 0.1 A_2.

A3.3.7.4.3.3. The estimated average specific activity of the solid does not exceed 2 x $10^{-3}A_2$/g.

A3.3.7.5. Surface Contaminated Object (SCO). SCO is classified in one of two groups; SCO-I and SCO-II.

A3.3.7.5.1. SCO-I. A solid object on which:

A3.3.7.5.1.1. The nonfixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4 Bq/cm^2 (10^4 microcurie/cm^2) for beta and gamma and low toxicity alpha emitters, or 0.4 Bq/cm^2 (10^{-5} microcurie/cm^2) for all other alpha emitters.

A3.3.7.5.1.2. The fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4 x 10^4 Bq/cm^2 (1.0 microcurie/cm^2) for beta and gamma and low toxicity alpha emitters, or 4 x 10^3 Bq/cm^2 (0.1 microcurie/cm^2) for all other alpha emitters.

A3.3.7.5.1.3. The nonfixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4 x 10^4 Bq/cm^2 (1 microcurie/cm^2) for beta and gamma and low toxicity alpha emitters, or 4 x 10^3 Bq/cm^2 (0.1 microcurie/cm^2) for all other alpha emitters.

A3.3.7.5.2. SCO-II. A solid object on which the limits for SCO-I are exceeded and on which:

A3.3.7.5.2.1. The nonfixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 400 Bq/cm^2 (10^2 microcurie/cm^2) for beta and gamma and low toxicity alpha emitters or 40 Bq/cm^2 (10^3 microcurie/cm^2) for all other alpha emitters.

A3.3.7.5.2.2. The fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 8 x 10^5 Bq/cm2 (20 microcuries/cm^2) for beta and gamma and low toxicity alpha emitters, or 8 x 10^4 Bq/cm^2 (2 microcuries/cm^2) for all other alpha emitters.

A3.3.7.5.2.3. The nonfixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 8 x 10^5 Bq/cm^2 (20 microcuries/cm^2) for beta and gamma and low toxicity alpha emitters, or 8 x 10^4 Bq/cm^2 (2 microcuries/cm^2) for all other alpha emitters.

A3.3.7.6. Fissile Material.

A3.3.7.6.1. Specific Requirements for Fissile Shipments.

A3.3.7.6.1.1. Packages containing fissile radioactive material which are not excepted according to **A3.3.7.10.** must be assigned a criticality safety index (CSI) and a transport index (TI).

A3.3.7.6.1.2. Fissile material packages and conveyances transporting these packages must satisfy the radiation level restrictions in **A3.3.7.16.**

A3.3.7.6.1.3. Except for consignments under exclusive use, the CSI of any packages or overpack may not exceed 50. A fissile material package with CSI greater than 50 must be transported by exclusive use.

A3.3.7.6.1.4. For non-exclusive use shipments of fissile material packages the total sum of CSIs in a freight container or on a conveyance may not exceed 100.

A3.3.7.6.1.5. Exclusive use shipments of fissile material packages must satisfy the radiation level and administrative requirements of 49 CFR 173.441(b).

A3.3.7.6.1.6. Mixing fissile material packages with other types of radioactive materials, in any conveyance is authorized only if the TI of any single packages does not exceed 10, the CSI of any single package does not exceed 50 and the requirements in this paragraph and in **A3.3.7.16.** are met.

A3.3.7.6.1.7. See **Attachment 24** for Fissile Class III shipments.

A3.3.7.6.2. Fissile Material Exception. Fissile material includes Uranium-233, Uranium-235, Plutonium-239, Plutonium-241, or any combination of these. Fissile material meeting one of the following is excepted from the requirement to be transported in packages that comply with 49 CFR 173.453 and from the other requirements of this manual. Only one type of exception is permitted per consignment.

A3.3.7.6.2.1. A mass limit per consignment such that:

$$\frac{\text{Mass of uranium -235 (g)}}{X} + \frac{\text{mass of other fissile material (g)}}{Y} < 1$$

Where X and Y are the mass limits defined in **Table A3.2.** provided one of the following:

A3.3.7.6.2.1.1. each individual package contains not more than 15g of fissile material.

A3.3.7.6.2.1.2. The fissile material is a homogenous hydrogenous solution or mixture where the ratio of fissile nuclides to hydrogen is less than 5% by mass.

A3.3.7.6.2.1.3. There is not more than 5g of fissile material in any 10L volume of material.

NOTE: Neither Beryllium nor Deuterium in hydrogenous material enriched in deuterium shall be present in quantities exceeding 1% of the applicable consignment mass limits provided in **Table A3.2.**

A3.3.7.6.2.2. Uranium enriched in Uranium-235 to a maximum of 1% by weight, and with a total plutonium and Uranium-233 content not exceeding 1% of the weight of Uranium-235, provided that the fissile material is distributed essentially homogeneously throughout the material. In addition, if Uranium-235 is present in metallic, oxide, or carbide forms, it must not form a lattice arrangement.

A3.3.7.6.2.3. Packages containing individually a total plutonium weight not more than 1kg of which, not more than 20% by weight may consist of Plutonium-239, Plutonium-241, or any combination of these radionuclides.

A3.3.7.6.2.4. Liquid solutions of uranyl nitrate enriched in Uranium-235 to a maximum of 2% by weight, with a total plutonium and Uranium-233 content not exceeding 0.002% of the weight of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) or 2.

Table A3.1. Consignment Mass Limits for Exceptions from the Requirements for Packages Containing Fissile Material

Fissile Material	Fissile Material mass (g) mixed with substances having an average hydrogen density = water	Fissile Material mass (g) mixed with substances having an average hydrogen density > water
Uranium -235 (X)	**400**	**290**
Other fissile material (Y)	**250**	**180**

A3.3.7.7. Low Dispersible Material. Low dispersible material shall be such that the radiation level at 3m from the unshielded radioactive material does not exceed 10 mSv/h.

A3.3.7.8. Subsidiary Risks.

A3.3.7.8.1. With the exception of UN 2908, UN 2909, UN 2910, UN 2911, UN 2977, and UN 2978, radioactive material with a subsidiary risk must meet the following:

A3.3.7.8.1.1. Be labeled with subsidiary risk labels corresponding to each subsidiary risk exhibited by the material. Corresponding placards must be affixed to transport units in accordance with the provisions of **Attachment 16**.

A3.3.7.8.1.2. Be allocated to Packing Groups I, II, or III, and if appropriate, by application of the grouping criteria in **A4.3.4.** corresponding to the nature of the predominant subsidiary risk.

A3.3.7.8.2. The basic description required on the Shipper's Declaration for Dangerous Goods must include a description of these subsidiary risks (e.g. "3, 6.1"), the name of the constituents which most predominantly contribute to the subsidiary risk(s), and where applicable, the packing group.

A3.3.7.8.3. Radioactive material with a subsidiary risk of Division 4.2 (Packing Group I) must be transported in Type B packages. Radioactive material with a subsidiary risk of Division 2.1 is forbidden from transport on passenger aircraft. Radioactive material with a subsidiary risk of Division 2.3 is forbidden from transport on passenger and cargo aircraft without a waiver or CAA, as appropriate.

A3.3.7.9. Unregulated Radioactive Material. The following radioactive materials are not regulated by this manual:

A3.3.7.9.1. Radioactive material implanted or incorporated into a person or live animal for diagnosis or treatment.

A3.3.7.9.2. Radioactive material in consumer products which have received regulatory approval, following their sale to the end user.

A3.3.7.9.3. Natural material and ores containing naturally occurring radionuclides, which are either in their natural state or have only been processed for purposes other than for extraction of the radionuclides, and not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in **A11.3.**

A3.3.7.9.4. Non-radioactive solid objects with radioactive substances present on any surfaces in quantities not in excess of the limit specified in **A3.3.7.5.**

A3.3.7.10. Types of Packaging. The types of packages used for radioactive material which are subject to the activity limits and material restrictions defined in **A11.3.**, **A11.5.8.**, **A11.6.1.**, **A11.7.**, and **A11.10.1.**, and meet the corresponding requirements are as follows. Packages containing fissile material or uranium hexafluoride are subject to additional requirements (see **A3.3.7.6.** and **A3.3.7.17.**).

A3.3.7.10.1. Excepted Packages.

A3.3.7.10.2. Industrial Package, Type 1 (Type IP-1 package).

A3.3.7.10.3. Industrial Package, Type 2 (Type IP-2 package).

A3.3.7.10.4. Industrial Package, Type 3 (Type IP-3 package).

A3.3.7.10.5. Type A Packages.

A3.3.7.10.6. Type B(U) and B(M) packages.

A3.3.7.10.7. Type C Packages.

A3.3.7.11. General Package Design Requirements.

A3.3.7.11.1. The packaging for the transport of radioactive material must provide the following:

A3.3.7.11.1.1. Containment to prevent contamination of people and the environment.

A3.3.7.11.1.2. Protection from radiation. The type of packaging depends on the amount and type of radiation (alpha, beta, gamma, neutron).

A3.3.7.11.1.3. Prevention of criticality in fissile material.

A3.3.7.11.1.4. Protection from internal heat generation.

A3.3.7.11.2. Design each package used for shipment of radioactive materials so that:

A3.3.7.11.2.1. The package can be easily handled and properly secured during transport.

A3.3.7.11.2.2. Each lifting attachment on the package, when used in the intended manner, with a minimum safety factor of three, does not impose an unsafe stress on the structure of the package. In addition, design the lifting attachment so that failure under excessive load does not impair the ability of the package to meet all other requirements of this attachment and **Attachment 11**. Remove, make inoperable for transport, or design with equivalent strength for lifting each attachment or other feature on the outer surface of the packaging that could be used to lift the package.

A3.3.7.11.2.3. The external surface, as far as practical, may be easily decontaminated.

A3.3.7.11.2.4. The outer layer of packaging avoids, as far as practicable, pockets or crevices where water might collect.

A3.3.7.11.2.5. Each feature that is added to the package at the time of transport, and is not a part of the package, does not reduce the safety of the package.

A3.3.7.11.2.6. The package will be capable of withstanding the effects of any acceleration, vibration, or vibration resonance that may occur during transportation without any deterioration in the effectiveness of the of any of the closing devices or in the integrity of the package and without loosening or unintentionally releasing the nuts, bolts, or other securing devices.

A3.3.7.11.2.7. The package will be capable of withstanding, without leakage, an internal pressure that produces a pressure differential of not less than the maximum normal operating pressure plus 95 kPa (14 psi).

A3.3.7.11.2.8. The packaging materials and any components will be physically and chemically compatible with each other and the contents.

A3.3.7.11.2.9. All valves through which the package contents could escape will be protected against unauthorized operation.

A3.3.7.12. Additional Packaging Design Requirements for Type A and B Packages.

A3.3.7.12.1. In addition to meeting the general design requirements each Type A packaging must also meet the design requirements of 49 CFR 173.412 and test requirements of 49 CFR 173.461.

A3.3.7.12.2. Each type B(U) or type B(M) package must meet the design and test requirements of 10 CFR Part 71.

A3.3.7.12.3. Each shipper of a DOT 7A package must maintain on file for at least 1 year after the latest shipment complete documentation of tests and an engineering evaluation or comparative data showing that the construction methods, packaging design, and materials of construction comply with that specification. Unless otherwise required, the shipper is exempt from maintaining this documentation if it is maintained by the Inventory Control Point (national stock number managing activity).

A3.3.7.13. Radioactive Material in Excepted Packages. Radioactive material in excepted Packages (UN2909, UN2910, and UN2911) are not regulated by this manual when prepared according to **A11.5.** and marked according to A14.4.6.6. If this material meets the definition and criteria of other classes/divisions, it must be prepared and certified according to the applicable Identification Number (UN, NA, ID).

A3.3.7.14. General Transportation Requirements.

A3.3.7.14.1. Secure each shipment of radioactive materials to prevent shifting during normal transportation conditions.

A3.3.7.14.2. Except as specifically required by a CAA, a package of radioactive materials may be carried among packaged general cargo without special stowage provisions, if:

A3.3.7.14.2.1. The heat output in watts is not over 0.1 times the minimum package dimension in centimeters. 49 CFR 173.448

A3.3.7.14.2.2. The average surface heat flux of the package is not over 15 watts per square meter (W/m^2) and the immediately surrounding cargo is not in sacks or bags or otherwise in a form that would seriously impede air circulation for heat removal. 49 CFR 173.448

A3.3.7.14.3. Aircraft in which radioactive materials have been spilled may not again be placed in service or routinely occupied until radiation dose rate at any accessible surface is less than 0.005 mSv/h (0.5 mrem/h) and there is no significant removable radioactive surface contamination as determined in A3.3.7.22. When contamination is present or suspected, segregate the package and any other materials it has touched as far as practical from personnel contact until needed radiological advice or assistance is obtained. For personnel safety, take care to avoid possible inhalation, ingestion, or contact with radioactive materials that may have leaked or spilled from its package. Leave any loose radioactive materials and associated packaging materials in a segregated area pending disposal instructions from responsible radiological authorities.

A3.3.7.14.4. Do not offer for military airlift:

A3.3.7.14.4.1. Any type B(U) or type B(M) package with an accessible surface temperature in excess of 50 degrees C (122 degrees F).

A3.3.7.14.4.2. Any continuously vented type B(M) packages, which require external cooling by an auxiliary cooling system or packages subject to operational controls during transport.

A3.3.7.14.4.3. Any liquid pyrophoric radioactive materials.

A3.3.7.14.5. Do not transport exclusive use shipments of packages having a surface radiation level in excess of 2 mSv/h (200 mrem/h) except by special arrangement.

A3.3.7.15. Stowage on Aircraft or Storage Incident to Transportation.

A3.3.7.15.1. Do not ship radioactive Category II-Yellow or Category III-Yellow material on the same aircraft or store in any one area, such as a transit area, terminal building, storeroom, or assembly yard, if the sum of the transport indexes in any individual group of packages exceeds 50. (49CFR 175.702)

A3.3.7.15.2. If the total transport index for all packages exceeds 50, separate the packages into groups. Store groups of these packages so as to maintain a spacing of at least 6 meters (20 feet) from other groups of packages containing radioactive materials

A3.3.7.15.3. Ensure separation of Category II-Yellow or Category III-Yellow material from packages containing undeveloped film according to the distances shown in 49 CFR 175.706.

A3.3.7.16. Radiation Level and Thermal Limitations.

A3.3.7.16.1. Design each package of radioactive materials so that:

A3.3.7.16.1.1. The radiation level is not more than 2 mSv/h (200 mrem/h) at any point on the external surface of the package. 49 CFR 173.441

A3.3.7.16.1.2. The transport index is not over 10. 49 CFR 173.441

A3.3.7.16.2. Design, construct, and load each package of radioactive material so that:

A3.3.7.16.2.1. The heat generated within the package due to the radioactive contents will not, at any time during transportation, affect the integrity of the package under normal transportation conditions.

A3.3.7.16.2.2. The temperature of the accessible external surfaces of the loaded package will not, assuming still air in the shade at an ambient temperature of 38 degrees C (100 degrees F), exceed either a temperature of 50 degrees C (122 degrees F) in other than an exclusive use shipment or 82 degrees C (180 degrees F) in an exclusive use shipment.

A3.3.7.17. Uranium Hexafluoride (Fissile and Low Specific Activity). In addition to any other applicable requirements of **Attachment 11**, package uranium hexafluoride, fissile or low specific activity, according to the requirements identified in 49 CFR 173.420:

A3.3.7.17.1. Clean packages before initial filling and during periodic inspection and tests.

A3.3.7.17.2. Design, fabricate, inspect, test, and mark packagings according to 49 CFR 173.420.

A3.3.7.17.3. Ensure uranium hexafluoride is in solid form when offered for transportation.

A3.3.7.17.4. The volume of the solid uranium hexafluoride at 20 degrees C (68 degrees F) must not exceed 61 percent of the volumetric capacity of the package.

A3.3.7.17.5. Ensure the pressure in the package at 20 degrees C (68 degrees F) is less than 101.3kPa (14.8 psia).

A3.3.7.17.6. Periodically inspect, test, and mark packages of uranium hexafluoride in accordance with 49 CFR 173.420

A3.3.7.17.7. Perform repairs to package(s) of uranium hexafluoride according to 49 CFR 173.420.

A3.3.7.18. Different Radionuclides in One Package. When different radionuclides are packaged together in the same package, the total activity must be determined in accordance with 49 CFR 173.433(d).

A3.3.7.19. Radioactive Material Packed With Other Items. A package containing radioactive material must not contain any other items except such articles and documents necessary for the use of the radioactive material, provided there is no interaction between them and the packaging or the radioactive contents that would reduce the safety of the package. LSA and SCO, however, may be packed with other items.

A3.3.7.20. Overpacks Containing Radioactive Material. The following applies:

A3.3.7.20.1. Packages of radioactive material may be combined together in an overpack for transport, provided that each package contained inside is packaged in accordance with this manual. Fissile material, however, which exceeds a transport index of zero must not be placed in an overpack.

A3.3.7.20.2. Only the original shipper of the packages contained in an overpack is permitted to use the method of direct measurement of radiation level to determine the transport index of the overpack.

A3.3.7.21. Requirements for Foreign-Made Packages. In addition to the requirements of **Attachment 11**, each shipper of a foreign-made type B(U), type B(M), type C, type CF, type H(U), type H(M) or fissile material package for which a competent authority certificate is required by the IAEA "Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1" must meet the requirements of 49 CFR 173.473.

A3.3.7.22. Radioactive Contamination.

A3.3.7.22.1. Contamination Control. Keep the level of nonfixed (removable) radioactive contamination on the external surfaces of each package offered for shipment as low as practical. The level of nonfixed radioactive contamination may be determined by wiping an area of 300 cm^2 of the surface concerned with an absorbent material, using moderate pressure, and measuring the activity on the wiping material. Take sufficient measurements in the most appropriate locations to yield a representative assessment of the nonfixed contamination levels. The amount of radioactivity measured on any single wiping material divided by the surface area wiped and divided by the efficiency of the wipe procedure may not exceed the limits set forth in **Table A3.1.** at any time during transport. Other methods of assessment of equal or greater efficiency may be used.

A3.3.7.22.2. Inspecting Aircraft for Contamination.

Periodically check aircraft used to routinely transport radioactive materials for radioactive contamination. Determine frequency of the checks based on the likelihood of contamination and the extent to which radioactive materials are carried aboard the aircraft. An aircraft must be taken out of service if the radiation dose rate at any accessible surface is 0.005 mSv/h (0.5 mrem/h) or if there is significant removable radioactive surface contamination as outlined above.

Table A3.2. Removable External Radioactive Contamination--Wipe Limits.

Contaminant	**Maximum permissible limits**		
	Bq/cm^2	**uCi/cm^2**	**dpm/cm^2**
Beta and gamma emitters and low toxicity alpha emitters.	4	10^{-4}	220
All other alpha emitting radionuclides	0.4	10^{-5}	2.2

A3.3.7.23. Transport Index and Criticality Safety Index (CSI).

A3.3.7.23.1. Transport Index – Radiation Exposure Control.

A3.3.7.23.1.1. The TI for a package, overpack, or freight container is the number derived using the following procedure:

A3.3.7.23.1.1.1. Determine the maximum radiation level at a distance of 1 m from the external surfaces of the package, overpack, or freight container. Where the radiation level is determined in units of millisievert per hour (mSv/h), the value determined must be multiplied by 100. Where the radiation level is determined in units of millirem per hour (mrem/h), the value is not changed. For uranium and thorium ores and concentrates, the maximum radiation dose rate at any point 1 m from the external surface of the load may be taken as follows:

A3.3.7.23.1.1.1.1. For ores and physical concentrates of uranium and thorium - 0.4 mSv/h (40 mrem/h).

A3.3.7.23.1.1.1.2. For chemical concentrates of thorium – 0.3 mSv/h (30 mrem/h).

A3.3.7.23.1.1.1.3. For chemical concentrates of uranium, other than uranium hexafluoride – 0.02 mSv/h (2 mrem/h).

A3.3.7.23.1.1.2. For freight containers, the value determined in **A3.3.7.23.1.1.1.** must be multiplied by the appropriate factor from **Table A3.2.**

Table A3.3. Multiplication Factors for Freight Containers

Largest Cross-Sectional Area of the Freight Container	**Multiplication Factor**
= 1 m^2	1
> 1 m^2 to = 5 m^2	2
> 5 m^2 to = 20 m^2	3
> 20 m^2	10

A3.3.7.23.1.1.3. The figure obtained in **A3.3.7.23.1.1.1.** and **A3.3.7.23.1.1.2.** must be rounded up to the first decimal place (e.g. 1.13 becomes 1.2), except that a value of 0.05 or less may be considered as zero.

A3.3.7.23.1.2. Transport Index – Consignment. The transport index for each overpack or freight container must be determined as either the sum of the TIs of all the packages contained, or by direct measurement of radiation level, except in the case of non-rigid overpacks for which the transport index must be determined only as the sum of the TIs of all the packages.

A3.3.7.23.2. Determination of Criticality Safety Index (CSI). The criticality Safety Index (CSI) for packages containing fissile material is determined in accordance with the instructions provided in 10 CFR 71. The CSI for an overpack, freight container, or consignment or consignment containing fissile material packages is the sum of the CSIs of all the fissile material packages contained within the overpack, freight container or consignment.

A3.3.8. Class 8.

A3.3.8.1. General Handling Instructions for Corrosive Materials.

A3.3.8.1.1. Store corrosive materials in a cool, well ventilated area away from sources of heat and oxidizing agents.

A3.3.8.1.2. Both the vapor and the liquid are corrosive and irritating and cause burns to the body and damage to the aircraft.

A3.3.8.1.3. Properly placard the storage area.

A3.3.8.1.4. Ensure protective masks or respirators, rubber gloves, goggles, and other protective clothing as required are readily available.

A3.3.8.2. Hypochlorite solution is not regulated by this manual if the chemical and physical properties, when tested, do not meet the criteria established for corrosive material. Comply with paragraph **1.10.4.** to identify non-regulated hypochlorite solutions (e.g., liquid bleaches tested according to 49CFR, 173.37).

A3.3.8.3. Packed with Other Materials. Do not pack bottles containing corrosive liquids in the same outer packaging with other hazardous materials.

A3.3.8.4. Packaging. Unless otherwise specified by a packaging paragraph, package a liquid material identified as PG III in **Table A4.1.** in a container that meets the PG I or II performance level.

A3.3.9. Class 9.

A3.3.9.1. General Handling Instructions.

A3.3.9.1.1. Class 9 material is generally considered less hazardous than other hazard classes due to the final form of the packaged material or item for transportation. However, Class 9 materials present a unique and equally hazardous situation during air transport. Personnel must exercise care when handling this material and ensure specific handling instructions located in the packaging paragraphs are observed.

A3.3.9.1.2. Use a chemical, CO2, Class D, or specific fire extinguisher for lithium metals, or deluge area with water to prevent spread of fire involving lithium batteries. Halon fire extinguishers are ineffective in combating fires involving primary (non-rechargeable) lithium batteries.

A3.3.9.2. Magnetized Material. Any package that has a magnetic field strength of more than 0.00525 gauss measured at 4.6 m (15 ft) from any surface of the package is forbidden on military aircraft.

A3.3.9.3. Vehicles and Support Equipment.

A3.3.9.3.1. Fuel levels for vehicles, engines, equipment, and other mechanical devices will be determined by the technical directive used to prepare the item for air movement. However, fuel levels cannot exceed limits established in **Attachment 13**. When technical directives do not specify fuel levels for shipment, the requirements of **Attachment 13** apply. Actual fuel levels will be determined by a fuel gauge. In absence of an operational fuel gauge, use a graduated dip stick. If positive means is not available to accurately determine fuel level, drain or siphon the tank. The tank may be refilled to appropriate level in the presence of an inspector (see paragraph **A28.1.2.**).

A3.3.9.3.2. Do not remove other hazardous materials from their packaging and store in the racks or containers of vehicles or equipment unless authorized by paragraph **A5.4.**

A3.3.9.3.3. Fire Suppression Systems. Vehicles and equipment integral fire suppression systems will be safed, secured, or disabled to prevent accidental activation during transportation.

A3.3.9.4. Unregulated Engines and Fuel Components. The following items when drained, purged, and containing no other hazardous materials are nonhazardous for transportation. Comply with paragraph **1.10.4.**

A3.3.9.4.1. Vehicles and internal combustion engines, with or without fuel tanks attached, prepared for shipment according to applicable technical directives or standards. Fuel systems including carburetors, pumps, controls, and fuel tanks must be completely drained, purged, and sealed with appropriate pressure seal type plug and caps with gaskets and "O" rings.

A3.3.9.4.2. Aircraft engines which are drained and purged according to the responsible technical manual, and containing no other hazardous materials.

A3.3.9.4.3. Fuel tanks, and cells that are drained, purged, and sealed according to the applicable technical directive.

A3.3.9.4.4. All preserved and packed serviceable fuel assemblies, for example, carburetors, fuel pumps, filters, etc., that are drained and purged of all fuel. In addition, they must be sealed with proper caps, plugs, and covers according to the applicable technical directive. Use a barrier bag to contain residual purging fluid. Mark the type of purging fluid used and the flash point on the outer container.

A3.3.9.5. Dry Ice.

A3.3.9.5.1. Properties of Carbon Dioxide, Solid. At temperatures above -78.5 degrees C (-109.3 degrees F) dry ice will sublimate and release carbon dioxide fumes. If the carbon dioxide concentration in the aircraft is over 0.5 percent, crewmembers may suffer shortness of breath. Carbon dioxide concentrations of 3.0 percent are endurable from 1/2 to 1 hour. Concentrations of 5.0 percent are dangerous from 1/2 to 1 hour and concentrations of 9.0 percent are fatal from 5 to 10 minutes. Carbon dioxide is heavier than air; therefore, the highest concentration is at or near floor level. Caution crewmembers against lying on the cargo compartment floor or remaining in the cargo compartment for a prolonged period. If symptoms of overexposure are noted, the use of oxygen and increased ventilation should provide rapid relief.

A3.3.9.5.2. Seat passengers forward of and separate by the greatest distance possible (minimum one full pallet position) from dry ice.

A3.3.9.5.3. Passenger and crewmembers will not occupy the same pallet position as dry ice.

A3.3.9.5.4. Do not carry dry ice (exceeding passenger acceptable carry-on quantities specified in **Attachment 22**) in any upper deck compartment.

A3.3.9.5.5. Vent the aircraft cargo compartment to the greatest extent possible allowed by the flight profile and environmental conditions.

A3.3.9.5.6. Quantity limits specified in this paragraph apply to all personnel, other than aircrew members, who occupy the cargo compartment with dry ice. Aircrew members entering cargo compartments exceeding quantity limits specified in this paragraph should take precautions to prevent oxygen deprivation (i.e. oxygen masks).

A3.3.9.5.7. Pressurized Aircraft. For pressurized aircraft, the amount of dry ice that can be safely shipped by air regardless of the type container used depends on the sublimation rate of the ice, the volume of the aircraft, and the number of air changes per hour. To minimize the sublimation rate, use insulated containers surrounded with insulating blankets and tarpaulin during shipment to the greatest extent possible. To determine the amount of dry ice that can be safely shipped by air, use the formula in **Figure A3.6.**

A3.3.9.5.8. Aircraft on Minimum Air Changes. When aircraft is on minimum air changes per hour, safe loads are drastically reduced. When the aircraft is on the ground longer than 45 minutes, recalculate the safe quantity using new numbers of air changes per hour. Maximum quantities are shown in **Figure A3.7.** and **Figure A3.8.**

Figure A3.6. Formula For Determining Dry Ice Limitations.

$$X = \frac{VA(0.47)}{32.3}$$

Where:

V= Volume of aircraft

A= Air changes per hour

X= Maximum dry ice loading in pounds

Figure A3.7. Dry Ice Limitations When Aircraft is on Minimum Air Changes.

Aircraft	**Maximum Amount**	
Type	**in Pounds**	**Kilograms**
C-130	600	272
C-135	200	91
C-141B (See Note 1)	3,430	1,556

Figure A3.8. Maximum Quantities for Dry Ice Aboard C-17 Aircraft.

	Maximum Amount in Pounds	Maximum Amount in Kilograms
Two Packs High Flow Setting at 35,000 feet	3,430	1,556
Two Packs High Flow Setting at 10,000 feet or less	2,080	943
Two Packs Normal Flow Setting at 35,000 feet	1,880	853
Two Packs Normal Flow Setting at 10,000 feet or less	1,040	472
One Pack High Flow Setting at 35,000 feet	1,720	780
One Pack High Flow Setting Holding at 10,000 feet	1,040	472

NOTE: Above quantities are the maximum amounts for operating with no passengers in the cargo compartment. Limitation with passengers in the cargo compartment is set at 1,040 pounds (472 kilograms) for both high and normal flow.

A3.3.9.5.9. **Non-pressurized Aircraft.** For non-pressurized aircraft, the amount of dry ice that can be safely shipped by air depends upon the sublimation rate and ventilation of the aircraft. To minimize the sublimation rate, use insulated containers surrounded with insulating blankets and tarpaulins. The aircraft must have maximum ventilation during the shipment. With unpressurized cargo compartment, the quantity of dry ice that can be transported is unlimited if the fumes are vented overboard the aircraft. Maximum quantities aboard a C-5 aircraft are shown in **Figure A3.9.**

Figure A3.9. Maximum Quantities for Dry Ice Aboard C-5 Aircraft.

	Maximum amount in Pounds	Maximum Amount in Kilograms
Cruise (mach 0.5 and up) and altitudes up to 30,000 feet (Note 1)	4,700	2,132
Cruise (mach 0.6 and up) and altitudes up to 30,000 feet (Note 1)	3,120	1,415
During Non-pressurized up to 10,000 feet (Note 2)	6,500	2,948
During Ground Operations with one auxiliary power unit (Note 3)	2,950	1,338

NOTES:

1. The Environmental Control System (ECS) must be operated with “both” air conditioning units on a “Normal” flow control valve and the “Intermediate” setting on the alternative air valve.
2. The auxiliary vent value must be open for this condition.
3. The air turbine motor is at idle. The auxiliary vent valve must be open for this condition.

A3.3.9.5.10. KC-10 Aircraft. Dry ice may be carried in the KC-10 cargo compartment under the following aircraft operating conditions:

A3.3.9.5.10.1. If "one" air conditioning pack is lost in flight, then accomplish emergency procedures for cabin. Turn Cargo Smoke Light on per KC-10 flight manual T.O. 1C-10(K)A-1, Section II. Include "Smoke Source is not Accessible" portion of procedure except do not put cabin pressure control in manual and do not depressurize cabin.

A3.3.9.5.10.2. Environmental curtain at station 615 or 879: If "one" air conditioning pack is lost in flight, then accomplish emergency procedures for cabin, turn cargo smoke light on, mixed passenger and cargo configuration per KC-10 flight manual T.O 1C-10(k) A-1, section II, except do not initiate firefighting procedures.

A3.3.9.5.10.3. During cargo loading, the following procedures apply to minimize carbon dioxide concentration:

A3.3.9.5.10.3.1. Ensure APU is running and "both" air conditioning packs are operating.

A3.3.9.5.10.3.2. Open number 4 passenger service door for additional ventilation.

A3.3.9.5.10.3.3. Open all air inlets in the aerial refueling operator’s station and close aerial refueling operators hatch.

A3.3.9.5.10.3.4. Ensure environmental curtain is closed before flight.

A3.3.9.5.10.3.5. Transport maximum quantities as shown in **Figure A3.10.**

Figure A3.10. Maximum Quantities for Dry Ice Aboard KC-10 Aircraft.

	Maximum amount in Pounds	Maximum Amount in Kilograms
No environmental curtain (27 pallet all-cargo configuration):		
Both packs operating	2,295	1,041
One pack operating	1,251	568
Environmental curtain at station 615:		
Both packs operating	1,782	808
One pack operating	969	440
Environmental curtain at station 879:		
Both packs operating	1,204	546
One pack operating	653	296

A3.3.9.5.11. AMC Contract Aircraft. Do not transport more than 440 pounds (200 kilograms) of dry ice in a cargo compartment of AMC contract aircraft without prior approval from the individual air carrier.

A3.3.9.5.12. Packaging. Use fiberboard boxes, polystyrene foam containers, or other suitable packaging designed and constructed to permit the release of carbon dioxide gas and to prevent a build-up of pressure that could rupture the packaging. Use UN specification packaging when required by this manual.

A3.3.9.6. Lithium Batteries. Except when authorized in paragraph **A13.8.**, cells or batteries with liquid cathodes (not properly installed in equipment) may not be offered for transportation or be transported, if any cell has been discharged to the extent that the open circuit voltage is less than two volts or is less than two-thirds of the voltage of the fully charged cell, whichever is less. Liquid cathode batteries with voltage above these limits may be shipped in the same manner as a new battery.

A3.3.9.7. Non-Regulated Lithium Batteries. Lithium batteries are not subject to any other requirements of this manual (except paragraph **1.10.4.**) if they meet the lithium quantity and testing requirements specified in 49 CFR 173.185, or if they meet the following:

A3.3.9.7.1. Each cell with a liquid cathode may contain no more than 0.5 g (.02 ounces) of lithium content, each cell of a solid cathode may contain no more than 1.0 g (.04 ounces) of lithium content, and each lithium ion cell may contain no more than 1.5g (.05 ounces) of lithium content.

A3.3.9.7.2. Each battery with a solid cathode must contain a total quantity of no more than 2 g (.07 ounces) of lithium content, each battery with a liquid cathode must contain a total quantity of no more than 1.0 g (.04 ounces) of lithium content, and each lithium ion battery may contain no more than 8g (.28 ounces) of lithium content.

A3.3.9.7.3. Each cell or battery containing a liquid cathode must be hermetically sealed.

A3.3.9.7.4. Cells and batteries must be securely packaged and offered for transportation in a manner that prevents the dangerous evolution of heat and short circuits.

A3.3.9.7.5. Electronic devices containing non-regulated lithium batteries must be shipped in a manner that prevents accidental activation of the power source during transport.

A3.3.9.7.6. If a liquid cathode battery contains more than 0.5 g (.02 ounces) of lithium or lithium alloy, or a solid cathode battery contains more than 1.0 g (.04 ounces) of lithium or lithium alloy, it may not contain a liquid or gas that is a hazardous material unless the liquid or gas, if free, would be completely absorbed or neutralized by other material in the battery.

A3.3.9.7.7. Lithium batteries installed in consumer use articles (laptops, cameras, watches, etc).

A3.3.9.8. Consumer Commodities. Inner packagings containing hazardous liquids re-classified as a Consumer Commodity must be capable of meeting internal air gauge pressure requirements of **A3.2.1.**

A3.4. Household Goods (HHG) Shipments. DOD 4500.9R, Part V, *Personnel Property Traffic Management Regulation* establishes requirements for the movement of HHG and specifies that hazardous materials are not authorized for military airlift. One exception is that engine power-driven equipment (motorcycle, moped, lawnmower, boat, snowmobile, etc.) may be transported as HHG under the following requirements:

A3.4.1. Completely drain all fuel.

A3.4.2. Run until the engine stalls.

A3.4.3. Drain all oil and cooling fluids.

A3.4.4. Allow fuel tanks and lines to remain open for at least 24 hours prior to pickup.

A3.4.5. Disconnect nonspillable gel-type batteries and tape the ends to prevent short circuit. Batteries may remain in the equipment holder, but ensure they are firmly secured and remain upright in the shipping container. Do not ship batteries with acid or alkali.

A3.4.6. Engine power-driven equipment prepared in this manner are not regulated by this manual. A Shipper’s Declaration for Dangerous Goods is not required.

Attachment 4

ITEMS LISTING

A4.1. General Requirements. This attachment contains :

A4.1.1. An alphabetical listing of the hazardous materials subject to the requirements of this manual. See paragraph **1.10.** for material determined to be nonhazardous.

A4.1.2. Classification criteria for hazard classes. See **Attachment 1** for definitions.

A4.1.3. Identification of items prohibited for military air transportation.

A4.1.4. Listing of Hazardous Substances and applicable Reportable Quantities.

A4.2. Using Table A4.1. Table A4.1. identifies "hazardous materials" for the purpose of military air transportation. To use **Table A4.1.** locate the proper shipping name (PSN) of the hazardous material and follow the information identified on the same line with the PSN. Use **Table A4.1.** to identify the following: eligibility of material for shipment, proper shipping name (PSN), hazard class and identification division, identification number, packing group (PG), subsidiary risk, special provisions applicable to the material (including passenger eligibility), and packaging paragraph.

A4.2.1. Column 1: Symbols. Column 1 contains symbols that pertain to the PSN.

A4.2.1.1. The letter "D" means that the PSN applies only to domestic shipments. These items are also identified by "NA" numbers in column 4. For international shipments, select an alternate PSN that is not preceded by a "D".

A4.2.1.2. The "*" (asterisk) identifies that a technical name is required in association with the PSN.

A4.2.1.3. The “+” (plus) fixes the proper shipping name, hazard class and packing group for that entry without regard to whether the material meets the definition of that class or packing group or meets any other hazard class definition.

A4.2.2. Column 2: Identification Number. Column 4 lists the identification number assigned to each PSN.

A4.2.2.1. Ship items classified with "UN" (United Nations) or "ID" (identification) numbers domestically or internationally.

A4.2.2.2. Ship items classified with "NA" (North American) numbers domestically only, or to and from Canada or Mexico. Use of “UN” numbers is preferred even for domestic shipment.

A4.2.2.3. New or revised UN or NA numbers in 49 CFR, part 172, ICAO, or IATA are recognized for use with this manual.

A4.2.3. Column 3: Proper Shipping Names (PSN). PSNs are listed alphabetically in all bold capital letters in **Table A4.1.** Use either singular or plural wording. New and revised PSNs in 49 CFR, part 172, ICAO, or IATA are authorized PSNs under this manual, provided the packaging requirements do not change. Alternate accepted spelling may be used provided the correct associated UN/ID number is used (e.g., “UN1350, SULFUR” vice “UN1350, SULPHUR”). A PSN modifier which appear as

lower case italicized letters are descriptive words which may be used, but are not required as part of the PSN.

A4.2.3.1. Technical or Chemical Group Names. Provide a technical or chemical group name in association with the PSN when required by an "*" in column 1.

A4.2.3.1.1. Organic Peroxides. Use technical names listed below the appropriate generic PSN (in lower case letters) in **Table A4.1.** See **A4.3.5.** for PSN assignment based on technical name.

A4.2.3.1.2. Mixtures and Solutions. If the hazardous material is a mixture or solution of two or more hazardous materials, enter the technical names of at least two components most contributing to the hazards of the mixture or solution in parentheses after the PSN.

A4.2.3.2. The Word "OR" in **Table A4.1.** The word "or" in a sequence of PSNs means that PSNs in the sequence are synonymous. Therefore, use of any one of the PSNs in the series is appropriate. Select only one PSN in the series when classifying the shipment. For Class 1 material, use the PSN listed in the JHCS.

A4.2.3.3. The Word "SEE" in **Table A4.1.** When one item references another item (by use of the word "see") and both names are in capital letters, use either name as the PSN. Forbidden designations and passenger restrictions applicable to the referenced entry also apply to the "see" entry.

A4.2.3.4. The Words "SOLUTION" or "MIXTURE". A mixture or solution containing a hazardous material listed by name in **Table A4.1.** together with one or more materials not subject to this manual must be identified by the PSN of the hazardous material. The qualifying word "solution" or "mixture" should be added to the PSN.

A4.2.3.5. Concentration Ranges. When a shipping name includes a concentration range as part of the shipping description, the actual concentration shipped (if it is in the range stated) may be used in place of the concentration range. For example, ship a hydrogen peroxide solution containing 30 percent peroxide as either "Hydrogen peroxide aqueous solution (with not less than 20 percent but not more than 40 percent hydrogen peroxide)" or "Hydrogen peroxide aqueous solution (with 30 percent hydrogen peroxide)."

A4.2.3.6. Hazardous Wastes. The PSN for a hazardous material that is a hazardous waste must include the word "WASTE" preceding the name of the material (i.e., WASTE, ACETONE). Comply with all requirements of this manual identified for the hazardous material when shipped as waste.

A4.2.4. Column 4: Hazard Class. Column 4 contains:

A4.2.4.1. Primary hazard class and division numbers. When this manual references hazard class, that includes any division number if appropriate. For Class 1 (explosives), the compatibility group is also given. See **A4.3.** for additional information on class/divisions.

A4.2.4.2. Some items that contain explosive material may be assigned to a classification other than Class 1 by DOD explosives hazard classification approval authorities due to the predominant hazard (see **A3.3.4.4.**). Compatibility group letters assigned to non-Class 1 material do not apply to military air transportation.

A4.2.5. Column 5: Packing Group (PG). Column 5 specifies one or more packing groups assigned to each PSN and hazard class. Hazard classes 2, 7, and ORM-D do not have packing groups. Unless otherwise identified, Hazard Class 1 are PG II. See **A4.4.** for additional information on PG.C

A4.2.6. Column 6: Subsidiary. Column 6 identifies the hazard class/division of any subsidiary risk posed by a material. Subsidiary risk may vary, depending on the applicable PG.

A4.2.7. Column 7: Special Provisions. Column 7 specifies codes for special provisions that are applicable for each PSN, hazard class, and PG. Special provision codes may vary, depending on the PG. Requirements of the special provision codes are identified in **Table A4.2.** The codes reflect four categories: numeric codes, codes beginning with "A", codes beginning with "N", and codes beginning with a “P”.

A4.2.7.1. Use codes beginning with a “P” to determine passenger eligibility for transport with hazardous materials.

A4.2.7.2. Use all other codes to determine packaging provisions, restrictions, and exceptions from requirements for particular quantities or forms of materials.

A4.2.7.3. When an additional packaging requirement is prescribed, the requirement is mandatory.

A4.2.8. Column 8: Packaging Paragraph. This column lists the applicable packaging paragraph. “FORBIDDEN” items are also identified in this column. Do not transport "FORBIDDEN" items by military aircraft.

A4.2.8.1. Except when otherwise identified, prepare hazardous material shipments according to the specified packaging paragraph.

A4.2.8.2. Packaging paragraphs in each attachment provide titles as a guide for PSNs covered by that paragraph. These titles are a guide only and are not all-inclusive.

A4.2.8.3. If a packaging paragraph in **Table A4.1.** specifies packaging that is not applicable to the form of the material (i.e., the packaging specified is for a solid material and the material shipped is in liquid form) use the following guidance to select the appropriate paragraph:

A4.2.8.3.1. Use either packaging paragraph **A8.2.** (liquids) or **A8.3.** (solids) as appropriate.

A4.2.8.3.2. Use either packaging paragraph **A9.5.** (liquids) or **A9.6.** (solids) as appropriate.

A4.2.8.3.3. Use either packaging paragraph **A10.4.** (liquids) or **A10.5.** (solids as appropriate).

A4.2.8.3.4. Use either packaging paragraph **A12.2.** (liquids) or **A12.3.** (solids) as appropriate).

A4.3. Classifying Hazardous Materials.

A4.3.1. Hazard Class Names. The hazard class and division is a numerical identification which describes the class (type) of primary hazard involved and if appropriate, its division within the class. Use the Hazardous Material Information Resource System (HMIRS), product Material Safety Data Sheet, or other manufacturer’s information if assistance in determining the hazard classification is needed. **Figure A4.1.** lists class and division numbers and the corresponding class and division names.

Figure A4.1. Hazard Classes.

HAZARD CLASS/ DIVISION NUMBER	HAZARD CLASS/ DIVISION NAME	HAZARD CLASS/ DIVISION NUMBER	HAZARD CLASS/ DIVISION NAME
1.1	Explosives (with mass explosion hazard)	4.1	Flammable solid
1.2	Explosives (with a projection hazard)	4.2	Spontaneously combustible material
1.3	Explosives (with predominately a fire hazard)	4.3	Dangerous when wet material
1.4	Explosives (with no significant blast hazard)	5.1	Oxidizer
1.5	Very insensitive explosives; blasting agents	5.2	Organic peroxide
1.6	Extremely insensitive detonating substances	6.1	Poisonous (toxic) material
2.1	Flammable gas	6.2	Infectious substances (etiologic agents)
2.2	Nonflammable gas	7	Radioactive material
2.3	Poisonous gas	8	Corrosive material
3	Flammable liquid	9	Miscellaneous hazardous material

A4.3.2. Items Not Specifically Listed. If a material is not specifically listed in **Table A4.1.**, determine the PSN by comparing the characteristics of the items with the definitions of the various hazard classes in this manual. Assign a "Not Otherwise Specified" (N.O.S.) name based on the hazard class of the material. Examples are: "FLAMMABLE LIQUID, N.O.S.; CORROSIVE SOLID, N.O.S." **Attachment 1** contains hazardous class definitions. Determine the appropriate technical name according to **A4.2.2.**

A4.3.3. Tentative PSN Assignment. A material for which the hazard class must be determined by testing, or a material that is a hazardous waste, the shipper may assign a tentative shipping name, based on:

A4.3.3.1. The defining criteria of the hazard class.

A4.3.3.2. The hazard precedence prescribed in **A4.3.4.**

A4.3.3.3. The shipper's knowledge of the material.

A4.3.3.4. A3.3.1.4 for new explosives.

A4.3.3.5. If a N.O.S. PSN is assigned, a technical name is not required.

A4.3.4. Precedence of Hazard. Assign any material specifically identified and listed in **Table A4.1.** the hazard class identified in column 3 of **Table A4.1.** Use other resources identified in **A4.3.1.** should be used to determine appropriate hazardous material description. If required, classify a hazardous material that is not specifically identified and listed in **Table A4.1.** (or is a mixture of materials), and meets the definition of more than one hazard, according to the following order of precedence:

A4.3.4.1. Class 7 (Radioactive material, other than limited quantities). When limited quantities are involved the other hazardous properties take precedence.

A4.3.4.2. Class 1 (Explosives).

A4.3.4.3. Class 2.3. (poisonous gas).

A4.3.4.4. Class 2.1 (flammable gas). See also Class 9.

A4.3.4.5. Class 2.2 (nonflammable gas). See also Class 9.

A4.3.4.6. Class 5.2 (organic peroxide).

A4.3.4.7. Class 6.2 (infectious substances or etiologic agents)

A4.3.4.8. Class 4.1. (flammable solid). Only self-reactive substances and wetted explosives.

A4.3.4.9. Class 4.2 (substances liable to spontaneous combustion) . Only pyrophoric substances.

A4.3.4.10. Class 6.1 (poisonous substances), PG I, poisonous by inhalation only.

A4.3.4.11. Small quantities of compressed gas such as starter fluid (Class 2.1) or fire extinguisher (Class 2.2) installed on a vehicle do not take precedence over the flammable liquid (Class 3).

A4.3.4.12. If required, classify other hazardous materials not identified above according to 49 CFR 173.2a.

A4.3.5. Hazard Classification of Class 5.2 Organic Peroxides. Class 5.2 organic peroxides are categorized into one of seven "types" in a system of generic proper shipping names. The generic PSN for the organic peroxide describes the physical state of the material (i.e., liquid or solid), provides an indication of controlled temperature requirements, and includes the "type" of the organic peroxide. The seven types of organic peroxides are described in **Attachment 1**. Transport all Class 5.2 material under one of the generic proper shipping names listed in **Table A4.1.** beginning with the words "ORGANIC PEROXIDE". Technical names are listed below each PSN in lower case letters. To determine the correct PSN:

A4.3.5.1. Find the technical name in **Table A9.1.** and select the UN identification number assigned to the technical name that best describes the item (in terms of concentration ranges, physical characteristics, etc).

A4.3.5.2. Turn to the "ORGANIC PEROXIDE" listed in **Table A4.1.** These entries constitute the "generic" organic peroxide proper shipping names.

A4.3.5.3. Match the UN identification number for the technical name with a UN identification number associated with the generic PSN.

A4.3.5.4. The generic PSN associated with organic peroxides will include the "type" under which the organic peroxide falls. Organic peroxide types are defined in **Attachment 1**.

A4.3.6. Hazard Classification of Fissile Materials. Except as provided in **A3.3.7.10.**, classify each package of fissile materials as fissile class I, II, or III. Determine the numerical values for package assignments as fissile class I, the transport indexes for fissile class II packages, and the conveyance limitations for fissile class III shipments according to 10 CFR Part 71.

A4.3.6.1. Fissile Class I. Packages may be transported in unlimited numbers, and in any arrangement, and require no nuclear criticality safety controls during transportation. A transport index is not assigned to fissile class I packages for the purpose of nuclear criticality safety control, although, the external radiation levels may require a transport index number.

A4.3.6.2. Fissile Class II. Packages may be transported together in any arrangement, but in numbers that are not over an aggregate transport index of 50. For the purposes of nuclear criticality safety control, individual packages may have a transport index of not less than 0.1 and not more than 10. However, the external radiation levels may require a higher transport index number. These shipments require no nuclear criticality safety control by the shipper during transportation.

A4.3.6.3. Fissile Class III. Shipments of packages of fissile materials that do not meet the requirements of fissile class I or fissile class II and are controlled in transit as prescribed in **Attachment 3** by appropriate arrangements between the shipper and the carrier.

A4.4. Determining Degree of Hazard (PG). For most material, the PG is assigned in column 5 of **Table A4.1.** Packing groups I, II, and III indicate the degree of hazard associated with the materials and are used to identify the severity of UN specification performance tests associated with the packaging for the item. Poisonous by inhalation material are assigned hazard zones (see **Attachment 1**) in **Table A4.1.** If unknown, the PG or hazard zone may be determined according to this paragraph. Class 2, and 7 do not have packing groups.

A4.4.1. Class 2 Hazard Zone. The hazard zone of a Class 2.3 material is given in column 7 of **Table A4.1.** When column 7 of **Table A4.1.** provides more than one hazard zone or is blank, determine the hazard zone from **Figure A4.2.** There are no hazard zones for Class 2.1 and 2.2.

Figure A4.2. Determination of Hazard Zone for Class 2.3.

Hazard Zone	Inhalation Toxicity (parts per million)
A	LC_{50} less than or equal to 200 ppm
B	LC_{50} greater than 200 ppm and less than or equal to 1000 ppm
C	LC_{50} greater than 1000 ppm and less than or equal to 3000 ppm
D	LC_{50} greater than 3000 ppm or less than or equal to 5000 ppm

A4.4.2. Class 3 Packing Groups. When **Table A4.1.** lists more than one PG for a material, or indicates that the PG is to be determined on the basis of the PG criteria for Class 3, determine the PG by using **Figure A4.4.** To use **Figure A4.3.**, match the initial boiling point and flash point of the material to the corresponding PG. Flash points may be determined from the material safety data sheet, the Hazardous

Material Information Resource System (HMIRS), the National Fire Protection Guide, or markings on the package. For example, a Class 3 material with an initial boiling point of 38 degrees C (100 degrees F) and a flash point of 25 degrees C (77 degrees F) would be assigned a PG III. If the initial boiling point is less than or equal to 35 degrees C (95 degrees F), assign PG I. Viscous Class 3 material (i.e., paints, varnishes, enamels, lacquers, adhesives, and polishes) in PG II with a flash point of less than 23 degrees C (73 degrees F) may be grouped in PG III provided the requirements of 49 CFR 173.121(b) are met.

Figure A4.3. Criteria for Class 3 PG.

PG	Flash Point (closed-cup)	Initial Boiling Point
I		less than or equal to 35°C (95°F)
II	less than 23°C (73°F)	greater than 35°C (95°F)
III	equal to or greater than 23°C (73°F) but less than or equal to 60.5°C (141°F)	greater than 35°C (95°F)

A4.4.3. Class 4 Packing Groups. When **Table A4.1.** indicates that the PG of the material is to be determined on the basis of test criteria for Class 4 material, the test methods and appropriate criteria must comply with 49 CFR, part 173.125.

A4.4.4. Class 5 Packing Groups. When column 5 of **Table A4.1.** is blank for a solid in Class 5.1, determine the PG based on the test criteria found in 49 CFR, part 173.127. If column 5 is blank for a liquid in Class 5.1, packing groups can be assigned by a comparison to existing entries in **Table A4.1.**

A4.4.5. Class 6 Packing Groups and Hazard Zone. When **Table A4.1.**, column 5 provides more than one PG and hazard zone for a specific Class 6.1 material, determine the PG and hazard zone by applying the following criteria:

A4.4.5.1. Determine the PG assignment for other than inhalation of vapors by using **Figure A4.4.**

A4.4.5.2. Determine the PG and hazard zone assignments for inhalation of vapors by using **Figure A4.5.**

Figure A4.4. PG Assignment For Other Than Inhalation of Vapors.

PG	Oral Toxicity LD_{50}(mg/kg)	Dermal Toxicity LD_{50} (mg/kg) LC_{50}mg/L)	Inhalation Toxicity by dusts and mists
I	$\leq$ 5	$\leq$40	$\leq$0.5
II	> 5, $\leq$ 50	>40, $\leq$200	<0.5, $\leq$2
III	solids: > 50, $\leq$200, liquids > 50, $\leq$500	>200, $\leq$1000	> 2, $\leq$10

Figure A4.5. Inhalation Toxicity.

PG (Hazard Zone)	Vapor Concentration and Toxicity
I (Hazard Zone A)	V $\geq$500 LC_{50} and $LC_{50} \leq$ 200 mL/M^3
I (Hazard Zone B)	V $\geq$10 LC_{50} and $LC_{50} \leq$1000 mL/m^3 , and the criteria for PG I, hazard zone A are not met
II (Hazard Zone C)	V $\geq LC_{50}$ and $LC_{50} \leq$3000 mL/m^3, and the criteria for PG I, hazard zones A and B are not met
III (Hazard Zone D)	V $\geq$.2 LC_{50} and LC_{50} < 5000 mL/m^3, and the criteria for packing groups I and II, hazard zones A, B, and C are not met

A4.4.5.3. "V" is the saturated vapor concentration in air of the material in mL/m^3 at 20 degrees C (68 degrees F) and standard atmospheric pressure.

A4.4.5.4. When the PG determined by **Figure A4.4.** and **Figure A4.5.** is different for two or more (oral, dermal, inhalation) requirements, the PG assigned to the material is the highest degree of toxicity identified.

A4.4.5.5. Compute the PG and hazard zone for Class 6.1 mixtures that are poisonous (toxic) by inhalation as identified in 49 CFR 173.133 (b).

A4.4.6. Class 8 Packing Groups. When **Table A4.1.** lists more than one PG for a material, determine the PG according to 49 CFR 173.137.

A4.5. Hazardous Substances. **Table A4.3.** identifies materials that are designated hazardous substances under Section 101 (14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). See **Attachment 1** for a detailed definition of a hazardous substance. Ensure review of **Table A4.3.** to determine if a material is a hazardous substance.

A4.5.1. Determine if the material is a hazardous substance by identifying the reportable quantity (RQ) in **Table A4.3.** The RQ is used to determine if material is a hazardous substance. The material is a hazardous substance if the amount in one package equal or exceeds the RQ quantity. **Table A4.3.** specifies, in pounds and kilograms, the minimum quantity of the material that constitutes an RQ. For example: sodium arsenate (RQ-1.0/0.454) means the RQ is 1.0 pounds or 0.454 kilograms.

A4.5.2. A substance or solution is a "hazardous substance" when the concentration by weight equals or exceeds the concentration listed in **Figure A1.1.**

A4.5.3. If the technical name of the hazardous substance appears in **Table A4.1.**, then the technical name is the PSN. If the hazardous substance does not appear in **Table A4.1.** and is not a forbidden material, select an appropriate generic (N.O.S.) PSN. Specify the technical name in parenthesis after the PSN. See **Attachment 17** for certification requirements.

A4.5.4. For Radionuclides, see 49 CFR 172.101, Appendix A.

Table A4.1. Alphabetical Listing of Items

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Accellerene; see **p-NITROSODIMETHYLANILINE**					
		Accumulators, electric; see **BATTERIES, WET,** *etc.*					
		Accumulators, pressurized, hydraulic (containing nonflammable gas),see **ARTICLES, PRESSURIZED, HYDRAULIC**					
		Accumulators, pressurized, pneumatic, see **ARTICLES, PRESSURIZED, PNEUMATIC**					
	UN1088	**ACETAL**	3	II		P5	**A7.2.**
	UN1089	**ACETALDEHYDE**	3	I		P3, A3	**A7.2.**
	UN1841	**ACETALDEHYDE AMMONIA**	9	III		P5	**A13.14.**
	UN2332	**ACETALDEHYDE OXIME**	3	III		P5	**A7.2.**
	UN2789	**ACETIC ACID, GLACIAL** *or* **ACETIC ACID SOLUTION**, *with more than 80% acid, by mass*	8	II	3	P5, A3, A6, A7, A10	**A12.2.**
	UN2790	**ACETIC ACID SOLUTION**, *with not less than 50%, but not more than 80% acid, by mass*	8	II		P5, A3, A6, A7, A10	**A12.2.**
	UN2790	**ACETIC ACID SOLUTION**, *with more than10%, but less than 50% acid, by mass*	8	III		P5	**A12.2.**
	UN1715	**ACETIC ANHYDRIDE**	8	II	3	P5, A3, A6, A7, A10	**A12.2.**
		Acetic oxide; see **ACETIC ANHYDRIDE**					
		Acetoin; see **ACETYL METHYL CARBINOL**					
	UN1090	**ACETONE**	3	II		P5	**A7.2.**
	UN1541	**ACETONE CYANOHYDRIN, STABILIZED**	6.1	I		P2, 2, A3, N34	**A10.6.**.
	UN1091	**ACETONE OILS**	3	II		P5	**A7.2.**
	UN1648	**ACETONITRILE**	3	II		P5	**A7.2.**
		Acetyl acetone peroxide with more than 9% by mass active oxygen					FORBIDDEN
		Acetyl benzoyl peroxide, solid, or with more than 40% in solution					FORBIDDEN
	UN1716	**ACETYL BROMIDE**	8	II		P5	**A12.2.**
	UN1717	**ACETYL CHLORIDE**	3	II	8	P5, A3, A6, A7, N34	**A7.2.**
		Acetyl cyclohexanesulphonyl peroxide,with more than 82% wetted with less than 12% water					FORBIDDEN
		Acetylene dichloride; see **DICHLOROETHYLENE**					
	UN1001	**ACETYLENE, DISSOLVED**	2.1			P4 , N88	**A6.9.**
		Acetylene (liquefied)					FORBIDDEN
		Acetylene silver nitrate					FORBIDDEN
	UN3374	**ACETYLENE, SOLVENT FREE**	2.1			P4	**A6.9.**
		Acetylene tetrabromide; see **TETRABROMOETHANE**					

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		Acetylene tetrachloride; *see* **TETRACHLOROETHANE**					
	UN1898	**ACETYL IODIDE**	8	II		P5	**A12.2.**
	UN2621	**ACETYL METHYL CARBINOL**	3	III		P5	**A7.2.**
		Acetyl oxide; see **ACETIC ANHYDRIDE**					
		Acetyl peroxide, solid or with more than 25% in solution					FORBIDDEN
		Acid butyl phosphate, see **BUTYL ACID PHOSPHATE**					
		Acid, sludge, see **Sludge Acid**					
		Acids, liquid, N.O.S.; see **CORROSIVE LIQUIDS, N.O.S.**					
		Acraldehyde, stabilized; see **ACROLEIN, STABILIZED**					
	UN2713	**ACRIDINE**	6.1	III		P5	**A10.5.**
	UN2607	**ACROLEIN DIMER, STABILIZED**	3	III		P5	**A7.2.**
	UN1092	**ACROLEIN, STABILIZED**	6.1	I	3	P1, 1	**A10.6.**
	UN2074	**ACRYLAMIDE, SOLID**	6.1	III		P5	**A10.5.**
	UN3426	**ACRYLAMIDE SOLUTION**	6.1	III		P5	**A10.4.**
	UN2218	**ACRYLIC ACID, STABILIZED**	8	II	3	P5	**A12.2.**
	UN1093	**ACRYLONITRILE, STABILIZED**	3	I	6.1	P3	**A7.2.**
		Activated charcoal; see **CARBON, ACTIVATED**					
	UN1133	**ADHESIVES**, *containing flammable liquid*	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
	UN2205	**ADIPONITRILE**	6.1	III		P5	**A10.4.**
	UN1950	**AEROSOLS** *or* **AEROSOLS, FLAMMABLE**	2.1			P5	**A6.2.**
		AEROSOLS, *flammable, containing substances in Class 8, Packing Group I*					FORBIDDEN
	UN1950	**AEROSOLS, *flammable,containing substances in Class 8, Packing Group II***	2.1		8		FORBIDDEN
	UN1950	**AEROSOLS, *flammable,containing substances in Class 8, Packing Group III***	2.1		8	P5	**A6.2.**
	UN1950	**AEROSOLS, *flammable,containing substances in Division 6.1, Packing Group I***					FORBIDDEN
	UN1950	**AEROSOLS**, *flammable containing substances in Division 6.1, Packing Group II*					FORBIDDEN
	UN1950	**AEROSOLS**, *flammable containing substances in Division 6.1, Packing Group III*	2.1		6.1	P5	**A6.2.**
	UN1950	**AEROSOLS,** *flammable, containing substances in Division 6.1, Packing Group III and substances in Class 8, Packing Group III*	2.1		6.1, 8	P5	**A6.2.**
	UN1950	**AEROSOLS, FLAMMABLE (ENGINE STARTING FLUID)** *or* **AEROSOLS, FLAMMABLE, N.O.S.** *(engine starting fluid)*	2.1			P5	**A6.2.**
	UN1950	**AEROSOLS** *or* **AEROSOLS, NON-FLAMMABLE**	2.2			P5	**A6.2.**

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	UN1950	**AEROSOLS, NON-FLAMMABLE** *(containing biological products or a medicinal preparation which will be deteriorated by a heat test)*	2.2			P5	**A6.2.**
	UN1950	**AEROSOLS,** *non-flammable, (tear gas devices)*	2.2		6.1	P5	**A6.2.**
	UN1950	**AEROSOLS,** *non-flammable, containing substances in Class 8, Packing Group I*	2.2		8		FORBIDDEN
	UN1950	**AEROSOLS, *non-flammable, containing substances in Class 8, Packing Group II***	2.2		8		FORBIDDEN
	UN1950	**AEROSOLS, *non-flammable, containing substances in Class 8, Packing Group II***	2.2		8	P5	**A6.2.**
	UN1950	**AEROSOLS, *non-flammable, containing substances in Class 8, Packing Group III***	2.2		8	P5	**A6.2.**
	UN1950	**AEROSOLS**, *non-flammable, containing substances in Division 6.1, Packing Group I or II*					FORBIDDEN
	UN1950	**AEROSOLS**, *non-flammable, containing substances in Division 6.1, Packing Group III*	2.2		6.1	P5	**A6.2.**
	UN1950	**AEROSOLS,** *non-flammable, containing substances in Division 6.1, Packing Group III and substances in Class 8, Packing Group III*	2.2		6.1, 8	P5	**A6.2.**
	UN1950	**AEROSOLS, *non-flammable, containing toxic gas***	2.3				FORBIDDEN
	UN1950	**AEROSOLS, *flammable, containing toxic gas***	2.3		2.1		FORBIDDEN
	UN0331	**AGENT, BLASTING TYPE B**	1.5D			P4, 105, 106, A69	**A5.12.**
	UN0332	**AGENT, BLASTING TYPE E**	1.5D			P4, 105, 106, A69	**A5.12.**
	UN0503	**AIR BAG INFLATORS** *or* **AIR BAG MODULES** *or* **SEAT-BELT PRETENSIONERS**	1.4G	II		P5	**A5.19.**
	UN3268	**AIR BAG INFLATORS** *or* **AIR BAG MODULES** *or* **SEAT-BELT PRETENSIONERS**	9	III		P5	**A13.15.**
	UN1002	**AIR, COMPRESSED**	2.2			P5, A124	**A6.3.**, **A6.5.**
	UN1003	**AIR, REFRIGERATED LIQUID** *(cryogenic liquid) pressurized*	2.2		5.1	P4	**A6.11.**
	UN1003	**AIR, REFRIGERATED LIQUID** *(cryogenic liquid)* n*on-pressurized*	2.2		5.1	P4	**A6.11.**
		Aircraft Engines; see **ENGINES, INTERNAL COMBUSTION**					
		Aircraft evacuation slides; see **LIFE-SAVING APPLIANCES**					
	UN3165	**AIRCRAFT HYDRAULIC POWER UNIT FUEL TANK** *(containing a mixture of anhydrous hydrazine and monomethyl hydrazine) (M86 fuel)*	3	I	6.1, 8	P3, A501	**A7.4.**.
		Aircraft Survival Kits; see **LIFE-SAVING APPLIANCES**					
*	UN3274	**ALCOHOLATES SOLUTION, N.O.S.** *in alcohol*	3	II	8	P5	**A7.2.**
	UN3065	**ALCOHOLIC BEVERAGES**	3	II III		P5 P5	**A7.2.** **A7.2.**
*	UN1987	**ALCOHOLS, N.O.S.**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**

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*	UN1986	**ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.**	3	I	6.1	P3	**A7.2.**
				II	6.1	P4	**A7.2.**
				III	6.1	P5	**A7.2.**
*	UN1989	**ALDEHYDES, N.O.S.**	3	I		P3	**A7.2.**
				II		P5	**A7.2.**
				III		P5	**A7.2.**
*	UN1988	**ALDEHYDES, FLAMMABLE, TOXIC, N.O.S**	3	I	6.1	P3	**A7.2.**
				II	6.1	P4	**A7.2.**
				III	6.1	P5	**A7.2.**
	UN2839	**ALDOL**	6.1	II		P5	**A10.4.**
*	UN3206	**ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S.**	4.2	II	8	P4	**A8.3.**
				III	8	P5	**A8.3.**
	UN1421	**ALKALI METAL ALLOYS, LIQUID, N.O.S**	4.3	I		P3, A2, A3, N34	**A8.2.**
	UN1389	**ALKALI METAL AMALGAMS, LIQUID**	4.3	I		P3, A2, A3, N34	**A8.2.**
	UN3401	**ALKALI METAL AMALGAMS, SOLID**	4.3	I		P3, N40	**A8.3.**
	UN1390	**ALKALI METAL AMIDES**	4.3	II		P5, A6, A7, A8, A19, A20	**A8.3.**
	UN1391	**ALKALI METAL DISPERSIONS** *or* **ALKALINE EARTH METAL DISPERSIONS**	4.3	I		P3, A2, A3	**A8.2.**
		Alkaline corrosive liquids, N.O.S.; see **CAUSTIC ALKALI LIQUIDS, N.O.S.**					
*	UN3205	**ALKALINE EARTH METAL ALCOHOLATES, N.O.S**	4.2	II		P4	**A8.3.**
				III		P5	**A8.3.**
	UN1393	**ALKALINE EARTH METAL ALLOYS, N.O.S**.	4.3	II		P5, A19	**A8.3.**
	UN1392	**ALKALINE EARTH METAL AMALGAMS LIQUID**	4.3	I		P3, A19, N34, N40	**A8.2.**
	UN3402	**ALKALINE EARTH METAL AMALGAM SOLID**	4.3	I		P3, A19, N34, N40	**A8.3.**
*	UN3140	**ALKALOIDS, LIQUID, N.O.S.** *or* **ALKALOID SALTS, LIQUID**, **N.O.S.**	6.1	I		P3, A4	**A10.4.**
				II		P5	**A10.4.**
				III		P5	**A10.4.**
*	UN1544	**ALKALOIDS, SOLID**, **N.O.S.** *or* **ALKALOID SALTS, SOLID, N.O.S.**, *poisonous*	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
	UN2584	**ALKYLSULFONIC ACIDS, LIQUID** *or* **ARYLSULFONIC ACIDS, LIQUID** *with more than 5% free sulphuric acid*	8	II		P5	**A12.2.**
	UN2586	**ALKYLSULFONIC ACIDS, LIQUID** *or* **ARYLSULFONIC ACIDS, LIQUID** *with not more than 5% free sulfuric acid*	8	III		P5	**A12.2.**
	UN2583	**ALKYLSULFONIC ACIDS, SOLID**, *or* **ARYLSULFONIC ACIDS, SOLID,** *with more than 5% free sulfuric acid*	8	II		P5	**A12.3.**

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	UN2585	**ALKYLSULFONIC ACIDS, SOLID**, *or* **ARYLSULFONIC ACIDS, SOLID,** *with not more than 5% free sulfuric acid*	8	III		P5	**A12.3.**
	UN3145	**ALKYLPHENOLS, LIQUID, N.O.S.** *(including C2-C12 homologues)*	8	I II III		P3 P5 P5	**A12.2.** **A12.2.** **A12.2.**
	UN2430	**ALKYLPHENOLS, SOLID, N.O.S.** *(including C2-C12 homologues)*	8	I II III		P5 P5 P5	**A12.3.** **A12.3.** **A12.3.**
*	UN2571	**ALKYLSULFURIC ACIDS**	8	II		P4	**A12.2.**
		Allethrin; see **PESTICIDES, LIQUID, TOXIC, N.O.S.**					
	UN2333	**ALLYL ACETATE**	3	II	6.1	P4	**A7.2.**
	UN1098	**ALLYL ALCOHOL**	6.1	I	3	P2, 2	**A10.6.**
	UN2334	**ALLYLAMINE**	6.1	I	3	P2, 2	**A10.6.**
	UN1099	**ALLYL BROMIDE**	3	I	6.1	P3	**A7.2.**
	UN1100	**ALLYL CHLORIDE**	3	I	6.1	P3	**A7.2.**
	UN1722	**ALLYL CHLOROFORMATE**	6.1	I	3, 8	P2, 2, A3, N41	**A10.6.**
	UN2335	**ALLYL ETHYL ETHER**	3	II	6.1	P4	**A7.2.**
	UN2336	**ALLYL FORMATE**	3	I	6.1	P3	**A7.2.**
	UN2219	**ALLYL GLYCIDYL ETHER**	3	III		P5	**A7.2.**
	UN1723	**ALLYL IODIDE**	3	II	8	P5, A3, A6, N34	**A7.2.**
	UN1545	**ALLYL ISOTHIOCYANATE, STABILIZED**	6.1	II	3	P4, A3, A7	**A10.4.**
		Allyl Isothiocyanate, Unstabilized					FORBIDDEN
	UN1724	**ALLYLTRICHLOROSILANE, STABILIZED**	8	II	3	P5, A7, N34	**A12.2.**
		Allyltrichlorosilane, Unstabilized					FORBIDDEN
	UN3052	**ALUMINIUM ALKYL HALIDES, LIQUID**	4.2	I	4.3	P3	**A8.5.**
	UN3461	**ALUMINIUM ALKYL HALIDES, SOLID**	4.2		4.3		FORBIDDEN
	UN3076	**ALUMINIUM ALKYL HYDRIDES**	4.2	I	4.3	P3	**A8.5.**
	UN3051	**ALUMINIUM ALKYLS**	4.2	I	4.3	P3	**A8.5.**
	UN2870	**ALUMINIUM BOROHYDRIDE** *or* **ALUMINIUM BOROHYDRIDE IN DEVICES**	4.2	I	4.3	P3	**A8.5.**
	UN1725	**ALUMINIUM BROMIDE, ANHYDROUS**	8	II		P5	**A12.3.**
	UN2580	**ALUMINIUM BROMIDE, SOLUTION**	8	III		P5	**A12.2.**
	UN1394	**ALUMINIUM CARBIDE**	4.3	II		P4, A20, N41	**A8.3.**
	UN1726	**ALUMINIUM CHLORIDE, ANHYDROUS**	8	II		P5	**A12.3.**
	UN2581	**ALUMINIUM CHLORIDE, SOLUTION**	8	III		P5	**A12.2.**
		Aluminum dross, wet or hot					FORBIDDEN
	UN1395	**ALUMINIUM FERROSILICON POWDER**	4.3	II III	6.1 6.1	P4, A19 P5, A19, A20	**A8.3.** **A8.3.**
	UN2463	**ALUMINIUM HYDRIDE**	4.3	I		P3, A19, N40	**A8.3.**
D	NA9260	**ALUMINUM, MOLTON**	9				FORBIDDEN
	UN1438	**ALUMINIUM NITRATE**	5.1	III		P5, A1, A29	**A9.6.**

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		Aluminium phosphate solution; see **CORROSIVE LIQUIDS, N.O.S.**					
	UN1397	**ALUMINIUM PHOSPHIDE**	4.3	I	6.1	P3, A8, A19, N40	**A8.3.**
	UN3048	**ALUMINIUM PHOSPHIDE PESTICIDES**	6.1	I		P5, A8	**A10.5.**
	UN1309	**ALUMINIUM POWDER, COATED**	4.1	II		P5	**A8.3.**
				III		P5	**A8.3.**
	UN1396	**ALUMINIUM POWDER, UNCOATED**	4.3	II		P4, A19, A20	**A8.3.**
				III		P5, A19, A20	**A8.3.**
	UN3170	**ALUMINIUM SMELTING BY-PRODUCTS** *or* **ALUMINIUM REMELTING BY-PRODUCTS**	4.3	II		P4	**A8.3.**
				III		P5	**A8.3.**
	UN2715	**ALUMINIUM RESINATE**	4.1	III		P5	**A8.3.**
	UN1398	**ALUMINIUM SILICON POWDER, UNCOATED**	4.3	III		P5, A1, A19	**A8.3.**
		Amatols; see **EXPLOSIVE, BLASTING, TYPE B**					
*	UN2733	**AMINES, FLAMMABLE, CORROSIVE N.O.S.** *or* **POLYAMINES, FLAMMABLE, CORROSIVE N.O.S.**	3	I	8	P3	**A7.2.**
				II	8	P4	**A7.2.**
				III	8	P4	**A7.2.**
*	UN2734	**AMINES, LIQUID, CORROSIVE, FLAMMABLE N.O.S.** *or* **POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.**	8	I	3	P3, A3, A6, N34	**A12.2.**
				II	3	P4	**A12.2.**
*	UN2735	**AMINES, LIQUID, CORROSIVE, N.O.S.** *or* **POLYAMINES, LIQUID, CORROSIVE, N.O.S.**	8	I		P3, A3, A6, N34	**A12.2.**
				II		P4	**A12.2.**
				III		P5	**A12.2.**
*	UN3259	**AMINES, SOLID, CORROSIVE, N.O.S.** or **POLYAMINES, SOLID, CORROSIVE N.O.S.**	8	I		P5	**A12.3.**
				II		P5	**A12.3.**
				III		P5	**A12.3.**
	UN3317	**2-AMINO-4, 6-DINITORPHENOL,** *wetted with not less than 20% water by mass*	4.1	I		P5, 23, A8, A19, A20, N41	**A8.3.**
	UN2673	**2-AMINO-4-CHLOROPHENOL**	6.1	II		P5	**A10.5.**
	UN2946	**2-AMINO-5-DIETHYLAMINOPENTANE**	6.1	III		P5	**A10.4.**
	UN3055	**2-(2-AMINOETHOXY) ETHANOL**	8	III		P5	**A12.2.**
	UN2815	**N-AMINOETHYLPIPERAZINE**	8	III		P5	**A12.2.**
	UN2512	**AMINOPHENOLS** *(o-; m-; p-)*	6.1	III		P5	**A10.5.**
		AMINOPROPYLDIETHANOLAMINE *see* **AMINES,** *etc.*					
	UN2671	**AMINOPYRIDINES** *(o-; m-; p)*	6.1	II		P5	**A10.5.**
D	UN1005	**AMMONIA, ANHYDROUS**	2.2			P2, 13	**A6.4.**
	UN1005	**AMMONIA, ANHYDROUS**	2.3		8	P2, 4, 13, N87	**A6.4.**
D	UN3318	**AMMONIA SOLUTIONS,** *relative density less than 0.880 at 15 degrees C in water, with more than 50% ammonia*	2.2			P2, 13	**A6.4.**
	UN3318	**AMMONIA SOLUTIONS,** *relative density less than 0.880 at 15 degrees C in water, with more than 50% ammonia*	2.3		8	P2, 4 , N87	**A6.4.**

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	UN2672	**AMMONIA SOLUTIONS**, *relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10%, but not more than 35% ammonia*	8	III		P5	**A12.2.**
	UN2073	**AMMONIA SOLUTIONS**, *relative density less than 0.880 at 15 degrees C in water, with more than 35%, but not more than 50% ammonia*	2.2			P5, N87	**A6.3.**, **A6.4.**
	UN1546	**AMMONIUM ARSENATE**	6.1	II		P5	**A10.5.**
		Ammonium azide					FORBIDDEN
		Ammonium Bifluoride, Solid, see **AMMONIUM HYDROGEN DIFLUORIDE, SOLID**					
		***Ammonium bichromate, see* AMMONIUM DICHROMATE**					
		***Ammonium bifluoride,solid, see* AMMONIUM HYDROGENDIFLUORIDE, SOLID**					
		Ammonium Bifluoride, Solution, see **AMMONIUM HYDROGEN DIFLUORIDE, SOLUTION**					
		***Ammonium bisulphate, see* AMMONIUM HYDROGEN SULPHATE**					
		***Ammonium bisulphate solution, see* BISULPHITES,AQUEOUS SOLUTION, N.O.S.**					
		Ammonium bromate					FORBIDDEN
		Ammonium chlorate					FORBIDDEN
	UN1439	**AMMONIUM DICHROMATE**	5.1	II		P5	**A9.6.**
	UN1843	**AMMONIUM DINITRO-O-CRESOLATE, SOLID**	6.1	II		P5	**A10.5.**
	UN3424	**AMMONIUM DINITRO-O-CRESOLATE, SOLUTION**	6.1	II III		P5 P5	**A10.4.** **A10.4.**
	UN2505	**AMMONIUM FLUORIDE**	6.1	III		P5	**A10.5.**
	UN2854	**AMMONIUM FLUOROSILICATE**	6.l	III		P5	**A10.5.**
		Ammonium fulminate					FORBIDDEN
		Ammonium hydrate; see **AMMONIA SOLUTIONS,** *etc*.					
	UN1727	**AMMONIUM HYDROGENDIFLUORIDE, SOLID**	8	II		P5, N34	**A12.3.**
	UN2817	**AMMONIUM HYDROGENDIFLUORIDE, SOLUTION**	8	II III	6.1 6.1	P4, N34 P5	**A12.2.** **A12.2.**
	UN2506	**AMMONIUM HYDROGEN SULPHATE**	8	II		P5	**A12.3.**
D		*Ammonium hydroxide; see* **AMMONIA SOLUTIONS**, etc					
	UN2859	**AMMONIUM METAVANADATE**	6.1	II		P5	**A10.5.**
		ammonium nitrate fertilizer; which is more liable to explode than ammonium nitrate with 0.2 combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance					FORBIDDEN
	UN2071	**AMMONIUM NITRATE FERTILIZER**	9	III		P5	**A13.2.**
	UN2067	**AMMONIUM NITRATE BASED FERTILIZERS**	5.1	III		P5	**A9.6.**

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	UN3375	**AMMONIUM NITRATE EMULSION, AMMONIUM NITRATE SUSPENSION,** ***intermediate for blasting explosives***	5.1				FORBIDDEN
	UN2426	**AMMONIUM NITRATE LIQUID,** ***hot concentrated solution***	5.1				FORBIDDEN
D	NA0331	**AMMONIUM NITRATE-FUEL OIL MIXTURE** *(containing only prilled Ammonium Nitrate and fuel oil)*	1.5D			P4	**A5.12.**
	UN2426	**AMMONIUM NITRATE, LIQUID** *(hot concentrated solution*)	5.1				FORBIDDEN
	UN0222	**AMMONIUM NITRATE,** *with more than 0.2% combustible substances, including any organic substance calculated as carbon to the exclusion of any other added substance*	1.1D			P4, A69	**A5.8.**
	UN1942	**AMMONIUM NITRATE**, *with not more than 0.2% total combustible material, including any organic substance calculated as carbon, to the exclusion of any other added substance*	5.1	III		P5, A1, A29	**A9.6.**
		Ammonium nitrite					FORBIDDEN
	UN0402	**AMMONIUM PERCHLORATE**	1.1D			P4, 107	**A5.8.**
	UN1442	**AMMONIUM PERCHLORATE**	5.1	II		P5, 107, A9	**A9.6.**
		Ammonium Permanganate					FORBIDDEN
	UN1444	**AMMONIUM PERSULPHATE**	5.1	III		P5, A1, A29	**A9.6.**
	UN0004	**AMMONIUM PICRATE,** *dry or wetted with less than l0% water, by mass*	1.1D			P4	**A5.7.**
	UN1310	**AMMONIUM PICRATE, WETTED** *with not less than 10% water, by mass*	4.1	I		P4, 23, A2, N41	**A8.3.**
	UN2818	**AMMONIUM POLYSULPHIDE, SOLUTION**	8	II III	6.1 6.1	P4 P5	**A12.2.** **A12.2.**
	UN2861	**AMMONIUM POLYVANADATE**	6.1	II		P5	**A10.5.**
		Ammonium silicofluoride; see **AMMONIUM FLUOROSILICATE**					
	UN2683	**AMMONIUM SULPHIDE SOLUTION**	8	II	6.1, 3	P4	**A12.2.**
		Ammunition, blank; see **CARTRIDGES FOR WEAPONS, BLANK**					
		Ammunition, fixed, semi-fixed or separate loading; see **CARTRIDGES FOR WEAPONS**, *etc.*					
	UN0171	**AMMUNITION, ILLUMINATING,** *with or without burster, expelling charge or propelling charge*	1.2G			P4	**A5.13.**
	UN0254	**AMMUNITION, ILLUMINATING**, *with or without burster, expelling charge or propelling charge*	1.3G			P4	**A5.13.**
	UN0297	**AMMUNITION, ILLUMINATING,** *with or without burster, expelling charge or propelling charge*	1.4G			P5	**A5.13.**
	UN0247	**AMMUNITION, INCENDIARY** *liquid or gel, with burster, expelling charge or propelling charge*	1.3J			P3	**A5.13.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
		Ammunition, incendiary (water-activated contrivances) with burster, expelling charge or propelling charge; see **CONTRIVANCES, WATER-ACTIVATED**, *etc.*					
	UN0243	**AMMUNITION, INCENDIARY, WHITE PHOSPHOROUS**, *with burster expelling charge or propelling charge*	1.2H			P3	**A5.13.**
	UN0244	**AMMUNITION, INCENDIARY, WHITE PHOSPHOROUS,** *with burster expelling charge or propelling charge*	1.3H			P3	**A5.13.**
	UN0009	**AMMUNITION, INCENDIARY**, *with or without burster, expelling charge, or propelling charge*	1.2G			P4	**A5.13.**
	UN0010	**AMMUNITION, INCENDIARY**, *with or without burster, expelling charge, or propelling charge*	1.3G			P4	**A5.13.**
	UN0300	**AMMUNITION, INCENDIARY**, *with or without burster, expelling charge, or propelling charge*	1.4G			P5	**A5.13.**
	UN0362	**AMMUNITION, PRACTICE**	1.4G			P5	**A5.13.**
	UN0488	**AMMUNITION, PRACTICE**	1.3G			P4	**A5.13.**
	UN0363	**AMMUNITION, PROOF**	1.4G			P5	**A5.13.**
		Ammunition, SA (small arms); see **CARTRIDGES FOR WEAPONS**, *etc.*					
		Ammunition, smoke (water-activated contrivances), white phosphorus, with burster, expelling charge or propelling charge; see **CONTRIVANCES, WATER-ACTIVATED,** *etc.*					
		Ammunition, smoke (water-activated contrivances), without white phosphorus or phosphides, with burster, expelling charge or propelling charge; see **CONTRIVANCES, WATER-ACTIVATED,** *etc.*					
	UN0246	**AMMUNITION, SMOKE, WHITE PHOSPHORUS,** *with burster, expelling charge, or propelling charge*	1.3H			P3	**A5.13.**
	UN0245	**AMMUNITION, SMOKE, WHITE PHOSPHORUS,** *with burster, expelling charge, or propelling charge*	1.2H			P3	**A5.13.**
	UN0016	**AMMUNITION, SMOKE,** *with or without burster, expelling charge or propelling charge*	1.3G			P4	**A5.13.**
	UN0303	**AMMUNITION, SMOKE,** *with or without burster, expelling charge or propelling charge*	1.4G			P5	**A5.13.**
	UN0015	**AMMUNITION, SMOKE**, *with or without burster, expelling charge or propelling charge*	1.2G			P4	**A5.13.**
		Ammunition, sporting; see **CARTRIDGES FOR WEAPONS**, *etc. (UN0012,UN0328, UN0339)*					
	UN2017	**AMMUNITION, TEAR-PRODUCING**, **NONEXPLOSIVE**, *without burster or expelling charge, nonfuzed*	6.1	II	8	P4	**A10.5.**
	UN0018	**AMMUNITION, TEAR-PRODUCING**, *with burster expelling charge or propelling charge*	1.2G		8, 6.1	P4	**A5.13.**
	UN0019	**AMMUNITION, TEAR-PRODUCING**, *with burster expelling charge or propelling charge*	1.3G		8, 6.1	P4	**A5.13.**
	UN0301	**AMMUNITION, TEAR-PRODUCING**, *with burster expelling charge or propelling charge*	1.4G		8, 6.1	P5	**A5.13.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN2016	**AMMUNITION, TOXIC, NON-EXPLOSIVE,** *without burster or expelling charge, nonfuzed*	6.1	II		P2	**A10.5.**
		Ammunition, toxic (water-activated contrivances), with burster, expelling charge or propelling charge; see **CONTRIVANCES, WATER-ACTIVATED**, *etc.*					
*	UN0020	**AMMUNITION, TOXIC**, *with burster, expelling charge, or propelling charge*	1.2K		6.1	P1	**A5.4.**
*	UN0021	**AMMUNITION, TOXIC,** *with burster, expelling charge, or propelling charge*	1.3K		6.1	P1	**A5.4.**
	UN1104	**AMYL ACETATES**	3	III		P5	**A7.2.**
	UN2819	**AMYL ACID PHOSPHATE**	8	III		P5	**A12.2.**
		Amyl alcohols, see **PENTANOLS**					
	UN1106	**AMYLAMINES**	3	II III	8 8	P5 P5	**A7.2.** **A7.2.**
	UN2620	**AMYL BUTYRATES**	3	III		P5	**A7.2.**
	UN1107	**AMYL CHLORIDES**	3	II		P5	**A7.2.**
	UN1108	**n-AMYLENE**	3	I		P3	**A7.2.**
	UN1109	**AMYL FORMATES**	3	III		P5	**A7.2.**
	UN1111	**AMYL MERCAPTANS**	3	II		P5, A3	**A7.2.**
	UN1110	**n-AMYL METHYL KETONE**	3	III		P5	**A7.2.**
	UN1112	**AMYL NITRATE**	3	III		P5	**A7.2.**
	UN1113	**AMYL NITRITES**	3	II		P5	**A7.2.**
	UN1728	**AMYLTRICHLOROSILANE**	8	II		P5, A7, N34	**A12.2.**
		Anaesthetic ether; see **DIETHYL ETHER**					
		Anhydrous ammonia; see **AMMONIA, ANHYDROUS**					
		Anhydrous hydrazine; see **HYDRAZINE, ANHYDROUS**					
		Anhydrous hydrofluoric acid; see **HYDROGEN FLUORIDE, ANHYDROUS**					
+	UN1547	**ANILINE**	6.1	II		P5	**A10.4.**
	UN1548	**ANLINE HYDROCHLORIDE**	6.1	III		P5	**A10.5.**
	UN2431	**ANISIDINES, LIQUID**	6.1	III		P5	**A10.4.**
	UN2431	**ANISIDINES, SOLID**	6.1	III		P5	**A10.5.**
	UN2222	**ANISOLE**	3	III		P5	**A7.2.**
	UN1729	**ANISOYL CHLORIDE**	8	II		P5	**A12.2.**
		Anti-freeze liquid; see **FLAMMABLE LIQUIDS, N.O.S.**					
		Anti-knock compound, mixture; see **MOTOR FUEL ANTI-KNOCK MIXTURES**					
		Antimonious chloride, see **ANTIMONY TRICHLORIDE**					
	UN3141	**ANTIMONY COMPOUNDS, INORGANIC, LIQUID, N.O.S.**	6.1	III		P5	**A10.4.**
	UN1549	**ANTIMONY COMPOUNDS, INORGANIC, SOLID, N.O.S.**	6.1	III		P5	**A10.5.**

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	UN1550	**ANTIMONY LACTATE**	6.1	III		P5	**A10.5.**
	UN1730	**ANTIMONY PENTACHLORIDE, LIQUID**	8	II		P5	**A12.2.**
	UN1731	**ANTIMONY PENTACHLORIDE, SOLUTIONS**	8	II		P5	**A12.2.**
				III		P5	**A12.2.**
	UN1732	**ANTIMONY PENTAFLUORIDE**	8	II	6.1	P4, A3, A6, A7, A10, N3	**A12.2.**
	UN1551	**ANTIMONY POTASSIUM TARTRATE**	6.1	III		P5	**A10.5.**
	UN2871	**ANTIMONY POWDER**	6.1	III		P5	**A10.5.**
		Antimony sulphide and chlorate, mixture of					FORBIDDEN
		Antimony sulphide, solid, see **ANTIMONY COMPOUNDS, INORGANIC, N.O.S.**					
	UN1733	**ANTIMONY TRICHLORIDE, LIQUID**	8	II		P5	**A12.2.**
	UN1733	**ANTIMONY TRICHLORIDE, SOLID**	8	II		P5	**A12.3.**
		Aqua ammonia, see **AMMONIA SOLUTION**					
	UN1006	**ARGON, COMPRESSED**	2.2			P5	**A6.3.**, **A6.5.**
	UN1951	**ARGON, REFRIGERATED LIQUID** *(cryogenic liquid*)	2.2			P4	**A6.11.**
	UN1558	**ARSENIC**	6.1	II		P5	**A10.5.**
	UN1553	**ARSENIC ACID, LIQUID**	6.1	I		P3	**A10.4.**
	UN1554	**ARSENIC ACID, SOLID**	6.1	II		P5	**A10.5.**
	UN1562	**ARSENICAL DUST**	6.1	II		P5	**A10.5.**
*	UN2760	**ARSENICAL PESTICIDES, LIQUID**, **FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees* C	3	I	6.1	P3	**A7.2.**
				II	6.1	P4	**A7.2.**
*	UN2993	**ARSENICAL PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S.,** *flashpoint not less than 23 degrees C*	6.1	I	3	P3	**A10.4.**
				II	3	P4	**A10.4.**
				III	3	P5	**A10.4.**
*	UN2994	**ARSENICAL PESTICIDES, LIQUID, TOXIC**	6.1	I		P3	**A10.4.**
				II		P5	**A10.4.**
				III		P5	**A10.4.**
*	UN2759	**ARSENICAL PESTICIDES, SOLID, TOXIC**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
	UN1555	**ARSENIC BROMIDE**	6.1	II		P5	**A10.5.**
	UN1556	**ARSENIC COMPOUNDS, LIQUID, N.O.S.** *inorganic, including Arsenates, N.O.S., Arsenites, N.O.S., and Arsenic sulphides, N.O.S*	6.1	I		P3	**A10.4.**
				II		P5	**A10.4.**
				III		P5	**A10.4.**
	UN1557	**ARSENIC COMPOUNDS, SOLID, N.O.S.,** *including Arsenates, N.O.S., Arsenites, N.O.S., Arsenic sulphides, N.O.S., and Organic compounds of arsenic, N.O.S.*	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
		Arsenic, fuming liquid, see **ARSENIC TRICHLORIDE**					
	UN1559	**ARSENIC PENTOXIDE**	6.1	II		P5	**A10.5.**
		Arsenic sulphide and a chlorate, mixtures of					FORBIDDEN

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	UN1560	**ARSENIC TRICHLORIDE**	6.1	I		P2, 2	**A10.6.**
	UN1561	**ARSENIC TRIOXIDE**	6.1	II		P5	**A10.5.**
	UN2188	**ARSINE**	2.3		2.1	P1, 1	**A6.15.**
*	UN0486	**ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE** *or* **ARTICLES, EEI**	1.6N			P5	**A5.4.**
*	UN0349	**ARTICLES, EXPLOSIVE, N.O.S**	1.4S			P5, A69	**A5.4.**
*	UN0350	**ARTICLES, EXPLOSIVE, N.O.S.**	1.4B			P5	**A5.4.**
*	UN0351	**ARTICLES, EXPLOSIVE, N.O.S**.	1.4C			P5	**A5.4.**
*	UN0352	**ARTICLES, EXPLOSIVE, N.O.S.**	1.4D			P5	**A5.4.**
*	UN0353	**ARTICLES, EXPLOSIVE, N.O.S.**	1.4G			P5	**A5.4.**
*	UN0354	**ARTICLES, EXPLOSIVE, N.O.S**.	1.1L			P3	**A5.4.**
*	UN0355	**ARTICLES, EXPLOSIVE, N.O.S**.	1.2L			P3	**A5.4.**
*	UN0356	**ARTICLES, EXPLOSIVE, N.O.S.**	1.3L			P3	**A5.4.**
*	UN0462	**ARTICLES, EXPLOSIVE, N.O.S.**	1.1C			P4	**A5.4.**
*	UN0463	**ARTICLES, EXPLOSIVE, N.O.S**.	1.1D			P4	**A5.4.**
*	UN0464	**ARTICLES, EXPLOSIVE, N.O.S.**	1.1E			P4	**A5.4.**
*	UN0465	**ARTICLES, EXPLOSIVE, N.O.S**.	1.1F			P4	**A5.4.**
*	UN0466	**ARTICLES, EXPLOSIVE, N.O.S**.	1.2C			P4	**A5.4.**
*	UN0467	**ARTICLES, EXPLOSIVE, N.O.S.**	1.2D			P4	**A5.4.**
*	UN0468	**ARTICLES, EXPLOSIVE, N.O.S**.	1.2E			P4	**A5.4.**
*	UN0469	**ARTICLES, EXPLOSIVE, N.O.S**.	1.2F			P4	**A5.4.**
*	UN0470	**ARTICLES, EXPLOSIVE, N.O.S.**	1.3C			P4	**A5.4.**
*	UN0471	**ARTICLES, EXPLOSIVE, N.O.S**.	1.4E			P5	**A5.4.**
*	UN0472	**ARTICLES, EXPLOSIVE, N.O.S.**	1.4F			P5	**A5.4.**
	UN3164	**ARTICLES, PRESSURIZED HYDRAULIC** *containing nonflammable gas*	2.2			P5	**A6.4.**, **A6.5.**, **A6.8.**
	UN3164	**ARTICLES, PRESSURIZED, PNEUMATIC** *containing nonflammable gas*	2.2			P5	**A6.4.**, **A6.5.**, **A6.8.**
	UN0380	**ARTICLES, PYROPHORIC**	1.2L			P3	**A5.4.**
	UN0428	**ARTICLES, PYROTECHNIC** *for technical purposes*	1.1G			P4	**A5.19.**
	UN0429	**ARTICLES, PYROTECHNIC** *for technical purposes*	1.2G			P4	**A5.19.**
	UN0430	**ARTICLES, PYROTECHNIC** *for technical purposes*	1.3G			P4	**A5.19.**
	UN0431	**ARTICLES, PYROTECHNIC** *for technical purposes*	1.4G			P5	**A5.19.**
	UN0432	**ARTICLES, PYROTECHNIC** *for technical purposes*	1.4S			P5, A69	**A5.19.**
	UN2586	**ARYLSULPHONIC ACIDS. LIQUID,** ***with 5% or less free sulphuric acid***	8	III		P5	**A12.2.**
	UN2584	**ARYLSULPHONIC ACIDS. LIQUID,** ***with 5% more than 5% free sulphuric acid***	8	II		P5	**A12.2.**
	UN2585	**ARYLSULPHONIC ACIDS. SOLID,** ***with 5% or less free sulphuric acid***	8	III		P5	**A12.3.**
	UN2583	**ARYLSULPHONIC ACIDS. SOLID,** ***with more than 5% free sulphuric acid***	8	II		P5	**A12.3.**

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D	NA2212	**ASBESTOS**	9	III		P5	**A13.15.**
		Asbestos; see **BLUE ASBESTOS, WHITE ASBESTOS**, *or* **BROWN ASBESTOS**, *etc.*					
		Asphalt, cut back; see **TARS, LIQUID,** *etc.*					
D	NA1999	**ASPHALT**, *at or above its flashpoint*	9	III			FORBIDDEN
		Automobile, motorcycle, tractor, other self-propelled vehicle, engine, or other mechanical apparatus; see **BATTERY** *or* **VEHICLE**					
		Azaurolic Acid ***(salt of) (dry)***					FORBIDDEN
*	UN3334	**AVIATION REGULATED LIQUID, N.O.S.**	9			P5, A35, A506	**A13.14.**
*	UN3335	**AVIATION REGULATED SOLID, N.O.S.**	9			P5, A35, A506	**A13.14.**
		AziDODithiocarbonic acid					FORBIDDEN
		Azidoethyl nitrate					FORBIDDEN
		Azido guanidine picrate (dry)					FORBIDDEN
		5-Azido-1-hydroxy tetrazole					FORBIDDEN
		Azido hydroxy tetrazole (mercury and silver salts)					FORBIDDEN
		3-Azido-1, 2-propylene glycol dinitrate					FORBIDDEN
		1-Aziridinylphosphine oxide-(tris); see **TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE, SOLUTION**					
	UN3242	**AZODICARBONAMIDE**	4.1				FORBIDDEN
		*2,2'-Azodi-(2,4-dimethyl-4-*methoxyvaleronitrile) *see* **SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED**					
		*2,2'-*Azodi-(2,4 *dimethylvaleronitrile) see* **SELF-REACTIVE SOLID TYPE D TEMPERATURE CONTROLLED**					
		1,1'-Azodi-(hexahydrobenzonitrile) see **SELF-REACTIVE SOLID TYPE D**					
		Azodiisobutyronitrile, see **SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED**					
		2,2'-Azodi-(2-methylbutyronitrile), see **SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED**					
		Azotetrazole (dry)					FORBIDDEN
	UN1400	**BARIUM**	4.3	II		P4, A19	**A8.3.**
	UN1854	**BARIUM ALLOYS, PYROPHORIC**	4.2	I		P3	**A8.5.**
	UN0224	**BARIUM AZIDE**, *dry or wetted with less than 50% water, by mass*	1.1A		6.1	P3, 111, 117	**A5.5.**
	UN1571	**BARIUM AZIDE,** *wetted with not less than 50% water, by mass*	4.1	I	6.1	P4, A2	**A8.10.**
	UN2719	**BARIUM BROMATE**	5.1	II	6.1	P4	**A9.6.**
	UN1445	**BARIUM CHLORATE**, **SOLID**	5.1	II	6.1	P4, A9, N34	**A9.6.**
	UN3405	**BARIUM CHLORATE SOLUTION**	5.1	II III	6.1	P4, A9, N34 P4, A9, N34	**A9.5.** **A9.5.**
	UN1564	**BARIUM COMPOUNDS, N.O.S.**	6.1	II III		P5 P5	**A10.5.** **A10.5.**

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	UN1565	**BARIUM CYANIDE**	6.1	I		P5, N74, N75	**A10.5.**
	UN2741	**BARIUM HYPOCHLORITE** *with more than 22% available chlorine*	5.1	II	6.1	P5, A7, A9, N34	**A9.6.**
	UN1446	**BARIUM NITRATE**	5.1	II	6.1	P5	**A9.6.**
	UN1884	**BARIUM OXIDE**	6.1	III		P5	**A10.5.**
	UN1447	**BARIUM PERCHLORATE**, **SOLID**	5.1	II	6.1	P5	**A9.6.**
	UN3406	**BARIUM PERCHLORATE, SOLUTION**	5.1	II	6.1	P5	**A9.5.**
				III		P5	**A9.5.**
	UN1448	**BARIUM PERMANGANATE**	5.1	II	6.1	P5	**A9.6.**
	UN1449	**BARIUM PEROXIDE**	5.1	II	6.1	P5	**A9.6.**
		Barium selenate; see **SELENATES**					
		Barium selenite; see **SELENITES**					
	UN3292	**BATTERIES, CONTAINING SODIUM**	4.3	II		P5	**A8.18.**
	UN3028	**BATTERIES, DRY CONTAINING POTASSIUM HYDROXIDE SOLID,** *electric storage*	8	III		P5	**A12.3.**
	UN2794	**BATTERIES, WET, FILLED WITH ACID**, *electric storage*	8	III		P5	**A12.4.**
	UN2795	**BATTERIES, WET, FILLED WITH ALKALI**, *electric storage*	8	III		P5	**A12.4.**
	UN2800	**BATTERIES, WET, NONSPILLABLE**, *electric storage*	8	III		P5, A67	**A12.4.**
		Battery, Dry				A67	
	UN2796	**BATTERY FLUID, ACID**	8	II		P5, A3, A7, N6, N34	**A12.2.**, **A12.4.**
	UN2797	**BATTERY FLUID, ALKALI**	8	II		P5, N6	**A12.2.**, **A12.4.**
	UN3171	**BATTERY-POWERED EQUIPMENT***)*	9			P5, 134	**A13.6.**
	UN3171	**BATTERY-POWERED VEHICLE**	9			P5, 134	**A13.6.**
		Battery, wet, with wheelchair; see **BATTERY-POWERED EQUIMENT** *or* **BATTERY-POWERED VEHICLE**					
+	UN1990	**BENZALDEHYDE**	9	III		P5	**A13.2.**
	UN1114	**BENZENE**	3	II		P5	**A7.2.**
		Benzene diazonium chloride (dry)					FORBIDDEN
		Benzene diazonium nitrate (dry)					FORBIDDEN
		1,4-Benzenediol, see **HYDROQUINONE**					
		Benzene-1,3-disulphohydrazide, not more than 52% as a paste see **SELF- REACTIVE SOLID TYPE D**					
		Benzene-1,3-disulphonyl hydrazide, more than 52% as a paste					FORBIDDEN
		Benzene phosphorus dichloride; see **PHENYL PHOSPHORUS DICHLORIDE**					
		Benzene phosphorus thiodichloride; see **PHENYL PHOSPHORUS THIODICHLORIDE**					
		Benzene sulphohydrazide see **SELF-REACTIVE SOLID TYPE D**					
	UN2225	**BENZENESULPHONYL CHLORIDE**	8	III		P5	**A12.2.**
		Benzenethiol; see **PHENYL MERCAPTAN**					

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		Benzene triozonide					FORBIDDEN
	UN1885	**BENZIDINE**	6.1	II		P5	**A10.5.**
	UN2224	**BENZONITRILE**	6.1	II		P5	**A10.4.**
	UN2587	**BENZOQUINONE**	6.1	II		P5	**A10.5.**
	UN2226	**BENZOTRICHLORIDE**	8	II		P5	**A12.2.**
	UN2338	**BENZOTRIFLUORIDE**	3	II		P5	**A7.2.**
		Benzoxidiazoles (dry)					FORBIDDEN
		Benzoyl azide					FORBIDDEN
	UN1736	**BENZOYL CHLORIDE**	8	II		P5	**A12.2.**
	UN1737	**BENZYL BROMIDE**	6.1	II	8	P4, A3, A7, N33, N34	**A10.4.**
	UN1738	**BENZYL CHLORIDE**	6.1	II	8	P4, A3, A7, N33, N42	**A10.4.**
	UN1738	**BENZYL CHLORIDE,** *unstabilized*	6.1	II	8	P4, A3, A7, N33, N34, N43	**A10.4.**
	UN1739	**BENZYL CHLOROFORMATE**	8	I		P3, A3, A6, N41	**A12.2.**
	UN2619	**BENZYLDIMETHYLAMINE**	8	II	3	P5	**A12.2.**
		4-(benzyl(ethyl)amino)-3-ethoxybenzenediazonium zinc chloride see **SELF-REACTIVE SOLID TYPE D**					
	UN1886	**BENZYLIDENE CHLORIDE**	6.1	II		P5	**A10.4.**
	UN2653	**BENZYL IODIDE**	6.1	II		P5	**A10.4.**
		4-(benzyl(methyl)amino)3-ethoxybenzenediazonium zinc chloride see **SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED**					
	UN1566	**BERYLLIUM COMPOUNDS, N.O.S.**	6.1	II III		P5 P5	**A10.5.** **A10.5.**
	UN2464	**BERYLLIUM NITRATE**	5.1	II	6.1	P5	**A9.6.**
	UN1567	**BERYLLIUM, POWDER**	6.1	II	4.1	P5	**A10.5.**
	UN2251	**BICYCLO [2,2,1] HEPTA-2-5-DIENE, STABILIZED** *or* **2,5-NORBORNADIENE, STABILIZED**	3	II		P5	P7.3
	UN3373	**BIOLOGIOCAL SUBSTANCE, CATEGORY B**	6.2			P5	**A10.9.**
	UN3291	**BIOMEDICAL WASTE, N.O.S.**	6.2	II		P5, A117	**A10.10.**
		Biphenyl triozonide					FORBIDDEN
*	UN2782	**BIPYRIDILIUM PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	I II	6.1 6.1	P3 P4	**A7.2.** **A7.2.**
*	UN3015	**BIPYRIDILIUM PESTICIDES, LIQUID, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	I II III	3 3 3	P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN3016	**BIPYRIDILIUM PESTICIDES, LIQUID, TOXIC**	6.1	I II		P3 P4	**A10.4.** **A10.4.**
*	UN2781	**BIPYRIDILIUM PESTICIDES, SOLID, TOXIC**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**

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	UN2837	**BISULFATE, AQUEOUS SOLUTION**	8	II III		P5, A7, N34 P5, A7, N34	**A12.2.** **A12.2.**
	UN2693	**BISULPHITES, AQUEOUS SOLUTIONS, N.O.S.**	8	III		P5	**A12.2.**
	UN0028	**BLACK, POWDER, COMPRESSED** *or* **GUNPOWDER, COMPRESSED** *or* **BLACK POWDER, IN PELLETS** *or* **GUNPOWDER, IN PELLETS**	1.1D			P4	**A5.9.**
	UN0027	**BLACK POWDER** *or* **GUNPOWDER,** *granular or as a meal*	1.1D			P4	**A5.9.**
	NA0027	**BLACK POWDER FOR SMALL ARMS**	4.1	I			FORBIDDEN
		Blasting agent, n.o.s.; see **EXPLOSIVES, BLASTING**					
		Blasting cap, assemblies; *see* **DETONATOR ASSEMBLIES NONELECTRIC,** *for blasting*					
		Blasting caps, electric; see **DETONATORS, ELECTRIC,** *for blasting*					
		Blasting caps, nonelectric; see **DETONATORS, NONELECTRIC,** *for blasting*					
		Bleaching powder; see **CALCIUM HYPOCHLORITE MIXTURES**, *etc*					
	UN2212	**BLUE ASBESTOS** *(crocidolite) or* **BROWN ASBESTOS** (*amosite, mysorite*)	9	II		P5	**A13.16.**
	UN0037	**BOMBS, PHOTO-FLASH**	1.1F			P4	**A5.13.**
	UN0038	**BOMBS, PHOTO-FLASH**	1.1D			P4	**A5.13.**
	UN0039	**BOMBS, PHOTO-FLASH**	1.2G			P4	**A5.13.**
	UN0299	**BOMBS, PHOTO-FLASH**	1.3G			P4	**A5.13.**
	UN2028	**BOMBS, SMOKE, NONEXPLOSIVE**, *with corrosive liquid, without initiating device*	8	II		P4	**A12.5.**
	UN0033	**BOMBS,** *with bursting charge*	1.1F			P4	**A5.13.**
	UN0034	**BOMBS,** *with bursting charge*	1.1D			P4	**A5.13.**
	UN0035	**BOMBS,** *with bursting charge*	1.2D			P4	**A5.13.**
	UN0291	**BOMBS,** *with bursting charge*	1.2F			P4	**A5.13.**
	UN0399	**BOMBS WITH FLAMMABLE LIQUID**, *with bursting charge*	1.1J			P3	**A5.4.**
	UN0400	**BOMBS WITH FLAMMABLE LIQUID,** *with bursting charge*	1.2J			P3	**A5.4.**
	UN0225	**BOOSTERS WITH DETONATOR**	1.1B			P4	**A5.17.**
	UN0268	**BOOSTERS WITH DETONATOR**	1.2B			P4	**A5.17.**
	UN0042	**BOOSTERS**, *without detonator*	1.1D			P4	**A5.16.**
	UN0283	**BOOSTERS**, *without detonator*	1.2D			P4	**A5.16.**
	UN1312	**BORNEOL**	4.1	III		P5, A1	**A8.3.**
+	UN2692	**BORON TRIBROMIDE**	8	I	6.1	P2, 2, A3, A7, N34	**A12.11.**
	UN1741	**BORON TRICHLORIDE**	2.3		8	P2, 3	**A6.4.**
	UN1008	**BORON TRIFLUORIDE**	2.3			P2, 2	**A6.5.**
	UN1742	**BORON TRIFLUORIDE ACETIC ACID COMPLEX, LIQUID**	8	II		P4	**A12.2.**

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	UN3419	**BORON TRIFLUORIDE ACETIC ACID COMPLEX, SOLID**	8	II		P5	**A12.4.**
	UN2604	**BORON TRIFLUORIDE DIETHYL ETHERATE**	8	I	3	P3, A19	**A12.2.**
	UN2851	**BORON TRIFLUORIDE DIHYDRATE**	8	II		P5	**A12.3.**
	UN2965	**BORON TRIFLUORIDE DIMETHYL ETHERATE**	4.3	I		P3, A19	**A8.2.**
	UN1743	**BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, LIQUID**	8	II		P4	**A12.2.**
	UN3420	**BORON TRIFLUORIDE PROPRIONIC ACID COMPLEX, SOLID**	8	II		P5	**A12.4.**
		Box toe gum; see **NITROCELLULOSE**					
	UN1450	**BROMATES, INORGANIC, N.O.S.**	5.1	II		P5	**A9.6.**
	UN3213	**BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.**	5.1	II III		P4	**A9.5.**
	UN1126	**1-BROMOBUTANE**	3	II		P5	**A7.2.**
	UN2901	**BROMINE CHLORIDE**	2.3		5.1, 8	P2, 2, N86	**A6.4.**
+	UN1744	**BROMINE** *or* **BROMINE SOLUTIONS**	8	I	6.1	P1, 1, A3, A6, N34, N43	**A12.11.**
		Bromine azide					FORBIDDEN
+	UN1745	**BROMINE PENTAFLUORIDE**	5.1	I	6.1, 8	P1, 1	**A9.9.**
+	UN1746	**BROMINE TRIFLUORIDE**	5.1	I	6.1, 8	P2, 2	**A9.9.**
	UN3425	**BROMOACETIC ACID, SOLID**	8	II		P5, A7, N34	**A12.3.**
	UN1938	**BROMOACETIC ACID, SOLUTION**	8	II		P4	**A12.2.**
+	UN1569	**BROMOACETONE**	6.1	II	3	P2, 2	**A10.3.**
	UN2513	**BROMOACETYL BROMIDE**	8	II		P5	**A12.2.**
	UN2514	**BROMOBENZENE**	3	III		P5	**A7.2.**
	UN1694	**BROMOBENZYL CYANIDES, LIQUID**	6.1	I		P3	**A10.4.**
	UN3449	**BROMOBENZYL CYANIDES, SOLID**	6.1	I		P5	**A10.5.**
	UN2688	**1-BROMO-3-CHLOROPROPANE**	6.1	III		P5	**A10.4.**
	UN2339	**2-BROMOBUTANE**	3	II		P5	**A7.2.**
	UN1887	**BROMOCHLOROMETHANE**	6.1	III		P5	**A10.4.**
		4-Bromo-1, 2-dinitrobenzene					FORBIDDEN
	UN2340	**2-BROMOETHYL ETHYL ETHER**	3	II		P5	**A7.2.**
	UN2515	**BROMOFORM**	6.1	III		P5	**A10.4.**
	UN2341	**1-BROMO-3-METHYLBUTANE**	3	III		P5	**A7.2.**
	UN2342	**BROMOMETHYLPROPANES**	3	II		P5	**A7.2.**
	UN3241	**2-BROMO-2-NITROPROPANE-1,3,-DIOL**	4.1	III		P5, 46	**A8.3.**
		1Bromo-3-Nitrobenzene (unstable at 56 degrees C)					FORBIDDEN
	UN2343	**2-BROMOPENTANE**	3	II		P5	**A7.2.**
	UN2344	**2-BROMOPROPANES** *or* **BROMOPROPANES**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN2345	**3-BROMOPROPYNE**	3	II		P5	**A7.2.**
		Bromosilane					FORBIDDEN
		Bromotoluene-alpha; see **BENZYL BROMIDE**					

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	UN2419	**BROMOTRIFLUOROETHYLENE**	2.1			P4	**A6.4.**
	UN1009	**BROMOTRIFLUOROMETHANE** *(R13B1)*	2.2			P5	**A6.3.**, **A6.4.**
	UN2212	**BROWN ASBESTOS**	9	II		P5	**A13.16.**
	UN1570	**BRUCINE**	6.1	I		P3	**A10.5.**
	UN0043	**BURSTERS,** *explosive*	1.1D			P4	**A5.17.**
	UN1010	**BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED,** ***containing more than 40% butadienes***	2.1			P4	**A6.3.**, **A6.4.**
	UN1010	**BUTADIENES, STABILIZED**	2.1			P4	**A6.3.**, **A6.4.**
		Butadienes, unstabilized					FORBIDDEN
	UN1011	**BUTANE** *or* **BUTANE MIXTURES**; *see also* **PETROLEUM GASES, LIQUEFIED**	2.1			P4	**A6.3.**, **A6.6.**
		Butane, butane mixtures and mixtures having similar properties in cartridges each not exceeding 500 grams see **RECEPTACLES**					
	UN2346	**BUTANEDIONE**	3	II		P5	**A7.2.**
		1,2,4-Butanetrio trinitrate					FORBIDDEN
	UN1120	**BUTANOLS**	3	II III		P5 P5	**A7.2.** **A7.2.**
		Tert-Butoxycarbonyl azide					FORBIDDEN
	UN1123	**BUTYL ACETATES**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN1718	**BUTYL ACID PHOSPHATE**	8	III		P5	**A12.2.**
	UN2348	**BUTYL ACRYLATE, STABILIZED**	3	III		P5	**A7.2.**
		Butyl alcohols; see **BUTANOLS**					
	UN1125	**N-BUTYLAMINE**	3	II	8	P5	**A7.2.**
	UN2738	**N-BUTYLANILINE**	6.1	II		P5	**A10.4.**
	UN2709	**BUTYLBENZENES**	3	III		P5	**A7.2.**
	UN1126	**1-BROMOBUTANE**	3	II		P5	**A7.2.**
		n-Butyl chloride; see **CHLOROBUTANES**					
	UN2743	**N-BUTYL CHLOROFORMATE**	6.1	I	8, 3	P2, 2	**A10.6.**
D	NA2742	**SEC-BUTYL CHLOROFORMATE**	6.1	I	3, 8	P2, 2	**A10.6.**
	UN2747	**TERT-BUTYLCYCLOHEXYL-CHLOROFORMATE**	6.1	III		P5	**A10.4.**
	UN1012	**BUTYLENE;** *see also* **PETROLEUM GASES, LIQUEFIED**	2.1			P4	**A6.6.**
	UN3022	**1,2-BUTYLENE OXIDE, STABILIZED**	3	II		P5	**A7.2.**
		Butyl ethers; see **DIBUTYL ETHERS**					
		Butyl ethyl ether; see **ETHYL BUTYL ETHER**					
	UN1128	**N-BUTYL FORMATE**	3	II		P5	**A7.2.**
	UN3255	**TERT-BUTYL HYPOCHLORITE**	4.2	I	8	P3	**A8.3.**
		Tert-Butyl Hydroperoxide, more than 90% with water					FORBIDDEN
	UN2690	**N-n-BUTYLIMIDAZOLE**	6.1	II		P5	**A10.4.**
	UN2484	**TERT-BUTYL ISOCYANATE**	6.1	I	3	P1, 1, A7	**A10.6.**

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	UN2485	**N-BUTYL ISOCYANATE**	6.1	I	3	P2, 2, A7	**A10.6.**
	UN2347	**BUTYL MERCAPTANS**	3	II		P5, A3	**A7.2.**
	UN2227	**N-BUTYL METHACRYLATE, STABILIZED**	3	III		P5	**A7.2.**
	UN2350	**BUTYL METHYL ETHER**	3	II		P5	**A7.2.**
		Tert-Butyl menoperoxymaleate, more than 52%					FORBIDDEN
		Tert-Butyl monoperoxyphthalate					FORBIDDEN
	UN2351	**BUTYL NITRITES**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
		Tert-Butyl peroxyacetate, more than 52% and less than 77%, when with more than 23% diluent type B					FORBIDDEN
		Tert-Butyl peroxyisobutyrate, more than 52% and less or equal to 77%, when with more than or equal to 23% diluent type B					FORBIDDEN
		Tert-Butyl peroxy acetate, with more than 75% in solutione					FORBIDDEN
		n-Butyl peroxydicarbonate with more than 52% in solution					FORBIDDEN
		Tert- Butyl peroxyisobutyrate with more than 77% in solution					FORBIDDEN
		Butyl phosphoric acid; see **BUTYL ACID PHOSPHATE**					
	UN1914	**BUTYL PROPIONATES**	3	III		P5	**A7.2.**
	UN2667	**BUTYLTOLUENES**	6.1	III		P5	**A10.4.**
	UN1747	**BUTYLTRICHLOROSILANE**	8	II	3	P4, A7, N34	**A12.2.**
	UN2956	**5-TERT-BUTYL-2,4,6-TRINITRO-M-XYLENE** *or* **MUSK XYLENE**	4.1	III		P5	**A8.4.**
	UN2352	**BUTYL VINYL ETHER, STABILIZED**	3	II		P5	**A7.2.**
		Butyl vinyl ether, unstabilized					FORBIDDEN
	UN2716	**1,4-BUTYNEDIOL**	6.1	III		P5, A1	**A10.5.**
	UN1129	**BUTYRALDEHYDE**	3	II		P5	**A7.2.**
	UN2840	**BUTYRALDOXIME**	3	III		P5	**A7.2.**
	UN2820	**BUTYRIC ACID**	8	III		P5	**A12.2.**
	UN2739	**BUTYRIC ANHYDRIDE**	8	III		P5	**A12.2.**
	UN2411	**BUTYRONITRILE**	3	II	6.1	P4	**A7.2.**
	UN2353	**BUTYRYL CHLORIDE**	3	II	8	P5	**A7.2.**
		Cable cutters, explosive; see **CUTTERS, CABLE, EXPLOSIVE**					
	UN1572	**CACODYLIC ACID**	6.1	II		P5	**A10.5.**
	UN2570	**CADMIUM COMPOUNDS**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
	UN1407	**CAESIUM**	4.3	I		P3, A19, N34, N40	**A8.3.**
	UN2682	**CAESIUM HYDROXIDE**	8	II		P5	**A12.3.**

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	UN2681	**CAESIUM HYDROXIDE SOLUTION**	8	II III		P5 P5	**A12.2.** **A12.2.**
	UN1451	**CAESIUM NITRATE**	5.1	III		P5, A1, A29	**A9.6.**
	UN1401	**CALCIUM**	4.3	II		P5	**A8.3.**
	UN1855	**CALCIUM ALLOYS, PYROPHORIC**	4.2	I		P3	**A8.11.**
	UN1573	**CALCIUM ARSENATE**	6.1	II		P5	**A10.5.**
	UN1574	**CALCIUM ARSENATE AND CALCIUM ARSENITE MIXTURES, SOLID**	6.1	II		P5	**A10.5.**
		Calcium bisulphite solutions; see **BISULPHITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.**					
	UN1402	**CALCIUM CARBIDE**	4.3	I II		P3, A1, A8, N34 P5, A1, A8, N34	**A8.3.** **A8.3.**
	UN1452	**CALCIUM CHLORATE**	5.1	II		P5, N34	**A9.6.**
	UN2429	**CALCIUM CHLORATE, AQUEOUS SOLUTION**	5.1	II III		P5, A2, N41 P5, A2, N41	**A9.5.** **A9.5.**
	UN1453	**CALCIUM CHLORITE**	5.1	II		P5, A9, N34	**A9.6.**
	UN1403	**CALCIUM CYANAMIDE** *with more than 0.1% of calcium carbide*	4.3	III		P5, A1, A19	**A8.3.**
	UN1575	**CALCIUM CYANIDE**	6.1	I		P5, N79	**A10.5.**
	UN1923	**CALCIUM DITHIONITE** *or* **CALCIUM HYDROSULPHITE**	4.2	II		P5, A19, A20	**A8.3.**
	UN1404	**CALCIUM HYDRIDE**	4.3	I		P3, A19, N40	**A8.3.**
		CALCIUM HYDROSULPHITE; *see* **CALCIUM DITHIONITE**					
	UN1748	**CALCIUM HYPOCHLORITE, DRY** *or* **CALCIUM HYPOCHLORITE MIXTURES, DRY** *with more than 39% available chlorine (8.8% available oxygen)*	5.1	II		P5, A7, A9, N34	**A9.6.**
	UN2880	**CALCIUM HYPOCHLORITE, HYDRATED** *or* **CALCIUM HYPOCHLORITE, HYDRATED MIXTURES,** ***with not less than 5.5% but not more than 16%*** *water*	5.1	II		P5	**A9.6.**
	UN2208	**CALCIUM HYPOCHLORITE MIXTURES, DRY** *with more than 10%, but not more than 39% available chlorine*	5.1	III		P5, A1, A29, N34	**A9.6.**
	UN2844	**CALCIUM MANGANESE SILICON**	4.3	III		P5, A1, A19	**A8.3.**
	UN1454	**CALCIUM NITRATE**	5.1	III		P5	**A9.6.**
	UN1910	**CALCIUM OXIDE**	8	III		P5	**A12.3.**
	UN1455	**CALCIUM PERCHLORATE**	5.1	II		P5	**A9.6.**
	UN1456	**CALCIUM PERMANGANATE**	5.1	II		P5	**A9.6.**
	UN1457	**CALCIUM PEROXIDE**	5.1	II		P5	**A9.6.**
	UN1360	**CALCIUM PHOSPHIDE**	4.3	I	6.1	P3, A8, A19, N40	**A8.3.**
	UN1855	**CALCIUM, PYROPHORIC** *or* **CALCIUM ALLOYS, PYROPHORIC**	4.2	I		P3	**A8.11.**
	UN1313	**CALCIUM RESINATE**	4.1	III		P5, A1, A19	**A8.3.**
	UN1314	**CALCIUM RESINATE, FUSED**	4.1	III		P5, A1, A19	**A8.3.**

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		Calcium selenate; see **SELENATES** *or* **SELENITES**					
	UN1405	**CALCIUM SILICIDE**	4.3	II		P5, A19	**A8.3.**
				III		P5, A1, A19	**A8.3.**
	UN1130	**CAMPHOR OIL**	3	III		P5	**A7.2.**
	UN2717	**CAMPHOR,** *synthetic*	4.1	III		P5, A1	**A8.3.**
		Cannon primers; see **PRIMERS, TUBULAR**					
	UN2829	**CAPROIC ACID**	8	III		P5	**A12.2.**
		Caps, blasting; see **DETONATORS,** *etc*					
		Caps, prime; see **PRIMERS, CAP TYPE**					
*	UN2758	**CARBAMATE PESTICIDES, LIQUID, FLAMMABLE**, **TOXIC**, *flashpoint less than 23 degrees C*	3	I	6.1	P3	**A7.2.**
				II	6.1	P4	**A7.2.**
*	UN2991	**CARBAMATE PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	I	3	P3	**A10.4.**
				II	3	P4	**A10.4.**
				III	3	P5	**A10.4.**
*	UN2992	**CARBAMATE PESTICIDES**, **LIQUID, TOXIC**	6.1	I		P3	**A10.4.**
				II		P4	**A10.4.**
				III		P5	**A10.4.**
*	UN2757	**CARBAMATE PESTICIDES, SOLID, TOXIC**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
		Carbolic acid; see **PHENOL, SOLID**, *or* **PHENOL, MOLTEN**					
		Carbolic acid solutions; see **PHENOL SOLUTIONS**					
	UN1362	**CARBON, ACTIVATED**	4.2	III		P5	**A8.3.**
	UN1361	**CARBON**, *animal or vegetable origin*	4.2	II		P5	**A8.3.**
				III		P5	**A8.3.**
		Carbon bisulphide; see **CARBON DISULPHIDE**					
		Carbon black (animal or vegetable origin);see **CARBON**					
	UN1013	**CARBON DIOXIDE**	2.2			P5	**A6.3.**, **A6.4.**, **A6.5.**
	UN2187	**CARBON DIOXIDE, REFRIGERATED LIQUID** *(cryogenic liquid)*	2.2			P5	**A6.3.**, **A6.11.**
	UN1845	**CARBON DIOXIDE, SOLID** *or* **DRY ICE**	9	III		P5	**A13.10.**
	UN1131	**CARBON DISULPHIDE**	3	I	6.1		FORBIDDEN
	UN1016	**CARBON MONOXIDE, COMPRESSED**	2.3		2.1	P2, 4	**A6.5.**
D	NA9202	**CARBON MONOXIDE, REFRIGERATED LIQUID** *(cryogenic liquid)*	2.3		2.1	P2, 4	**A6.11.**
	UN2516	**CARBON TETRABROMIDE**	6.1	III		P5	**A10.5.**
	UN1846	**CARBON TETRACHLORIDE**	6.1	II		P5, N36	**A10.4.**
		Carbonyl chloride; see **PHOSGENE**					
	UN2417	**CARBONYL FLUORIDE**	2.3		8	P2, 2	**A6.5.**
	UN2204	**CARBONYL SULPHIDE**	2.3		2.1	P2, 3	**A6.4.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
		Cartridge cases, empty primed; see **CASES, CARTRIDGE, EMPTY WITH PRIMER**					
		Cartridges, actuating for aircraft ejector seat catapult, fire extinguisher, canopy removal or apparatus; see **CARTRIDGES, POWER DEVICE**					
		Cartridges, explosive; see **CHARGES, DEMOLITION**					
	UN0049	**CARTRIDGES, FLASH**	1.1G			P4	**A5.19.**
	UN0050	**CARTRIDGES, FLASH**	1.3G			P4	**A5.19.**
	UN0326	**CARTRIDGES FOR WEAPONS, BLANK**	1.1C			P4	**A5.19.**
	UN0413	**CARTRIDGES FOR WEAPONS, BLANK**	1.2C			P4	**A5.13.**
	UN0327	**CARTRIDGES FOR WEAPONS, BLANK;** *or* **CARTRIDGES, SMALL ARMS, BLANK**	1.3C			P4	**A5.13.**
	UN0338	**CARTRIDGES FOR WEAPONS, BLANK**; *or* **CARTRIDGES, SMALL ARMS, BLANK**	1.4C			P5, A69	**A5.13.**
	UN0014	**CARTRIDGES FOR WEAPONS, BLANK***; or* **CARTRIDGES, SMALL ARMS, BLANK**	1.4S			P5, A69	**A5.13.**
	UN0328	**CARTRIDGES FOR WEAPONS, INERT PROJECTILE** *or* **CARTRIDGES, SMALL ARMS**	1.2C			P4	**A5.13.**
	UN0012	**CARTRIDGES FOR WEAPONS, INERT PROJECTILE** *or* **CARTRIDGES, SMALL ARMS**	1.4S			112, P5, A69	**A5.13.**
	UN0339	**CARTRIDGES FOR WEAPONS, INERT PROJECTILE** *or* **CARTRIDGES, SMALL ARMS**	1.4C			P5, A69	**A5.13.**
	UN0417	**CARTRIDGES FOR WEAPONS, INERT PROJECTILE** *or* **CARTRIDGES, SMALL ARMS**	1.3C			P4	**A5.13.**
	UN0005	**CARTRIDGES FOR WEAPONS**, *with bursting charge*	1.1F			P4	**A5.13.**
	UN0007	**CARTRIDGES FOR WEAPONS**, *with bursting charge*	1.2F			P4	**A5.13.**
	UN0348	**CARTRIDGES FOR WEAPONS**, *with bursting charge*	1.4F			P5	**A5.13.**
	UN0412	**CARTRIDGES FOR WEAPONS**, *with bursting charge*	1.4E			P5	**A5.13.**
	UN0006	**CARTRIDGES FOR WEAPONS,** *with bursting charge*	1.1E			P4	**A5.13.**
	UN0321	**CARTRIDGES FOR WEAPONS**, *with bursting charge*	1.2E			P4	**A5.13.**
		Cartridges, illuminating; see **AMMUNITION ILLUMINATING**, *etc*					
	UN0277	**CARTRIDGES, OIL WELL**	1.3C			P4, A69	**A5.18.**
	UN0278	**CARTRIDGES, OIL WELL**	1.4C			P5, A69	**A5.18.**
	UN0275	**CARTRIDGES, POWER DEVICE**	1.3C			P4	**A5.18.**
	UN0276	**CARTRIDGES, POWER DEVICE**	1.4C			P5, 110	**A5.18.**
	UN0381	**CARTRIDGES, POWER DEVICE**	1.2C			P4	**A5.18.**
	UN0323	**CARTRIDGES, POWER DEVICE**	1.4S			P5, 110, 112, A69	**A5.18.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
		Cartridges, safety; see **CARTRIDGES, FOR WEAPONS, INERT PROJECTILES**					
	UN0054	**CARTRIDGES, SIGNAL**	1.3G			P4	**A5.19.**
	UN0312	**CARTRIDGES, SIGNAL**	1.4G			P5	**A5.19.**
	UN0405	**CARTRIDGES, SIGNAL**	1.4S			P5, A69	**A5.19.**
		CARTRIDGES, SMALL ARMS; *see* **CARTRIDGES FOR WEAPONS, INERT PROJECTILE**					
		CARTRIDGES, SMALL ARMS, BLANK*; see* **CARTRIDGES FOR WEAPONS, BLANK**					
		Cartridges, sporting; see **CARTRIDGES FOR WEAPONS,** *etc.*					
		Cartridges, starter, jet engine; see **CARTRIDGES, POWER DEVICE**					
	UN0055	**CASES, CARTRIDGE, EMPTY WITH PRIMER**	1.4S			P5, A69	**A5.20.**
	UN0379	**CASES, CARTRIDGE, EMPTY WITH PRIMER**	1.4C			P5, A69	**A5.20.**
	UN0447	**CASES, COMBUSTIBLE, EMPTY WITHOUT PRIMER**	1.3C			P4	**A5.20.**
	UN0446	**CASES, COMBUSTIBLE, EMPTY WITHOUT PRIMER**	1.4C			P5	**A5.20.**
		Casinghead gasoline; see **GASOLINE**					
	UN2969	**CASTOR BEANS** *or* **CASTOR MEAL** *or* **CASTER POMACE** *or* **CASTOR FLAKE**	9	II		P5	**A13.2.**
*	UN1719	**CAUSTIC ALKALI LIQUIDS, N.O.S.**	8	II III		P4 P5	**A12.2.** **A12.2.**
		Caustic potash; see **POTASSIUM HYDROXIDE SOLUTION,** *etc*					
		Caustic soda liquor; see **SODIUM HYDROXIDE,** *etc*					
	UN3292	**CELLS, CONTAINING SODIUM**	4.3	II		P4	**A8.18.**
	UN2000	**CELLULOID,** *in blocks, rods, rolls, sheets, tubes, etc. except scrap*	4.1	III		P5	**A8.3.**
	UN2002	**CELLULOID, SCRAP**	4.2	III		P5	**A8.3.**
		Cement, see **ADHESIVES** *containing flammable liquid*					
	UN1333	**CERIUM**, *slabs, ingots, or rods*	4.1	II		P5, N34	**A8.3.**
	UN3078	**CERIUM**, *turnings or gritty powder*	4.3	II		P5, A1	**A8.3.**
	UN1407	**CESIUM**	4.3	I		P3, A19, N34, N40	**A8.3.**
	UN1451	**CESIUM NITRATE** *or* **CAESIUM NITRATE**	5.1	III		P5, A1, A29	**A9.6.**
D	NA1361	**CHARCOAL** *briquettes, shell, screenings, wood, etc.*	4.2	III		P5	**A8.3.**
		Charcoal, wet					FORBIDDEN
	UN0457	**CHARGES, BURSTING, PLASTICS BONDED**	1.1D			P4	**A5.13.**
	UN0458	**CHARGES, BURSTING, PLASTICS BONDED**	1.2D			P4	**A5.13.**
	UN0459	**CHARGES, BURSTING, PLASTICS BONDED**	1.4D			P5	**A5.13.**

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	UN0460	**CHARGES, BURSTING, PLASTICS BONDED**	1.4S			P5, A69	**A5.13.**
	UN0048	**CHARGES, DEMOLITION**	1.1D			P4, A69	**A5.13.**
	UN0056	**CHARGES, DEPTH**	1.1D			P4	**A5.13.**
		Charges, expelling, explosive, for fire extinguishers; see **CARTRIDGES, POWER DEVICE**					
	UN0442	**CHARGES, EXPLOSIVE, COMMERCIAL** *without detonator*	1.1D			P4, A69	**A5.21.**
	UN0443	**CHARGES, EXPLOSIVE, COMMERCIAL** *without detonator*	1.2D			P4, A69	**A5.21.**
	UN0444	**CHARGES, EXPLOSIVE, COMMERCIAL** *without detonator*	1.4D			P5, A69	**A5.21.**
	UN0445	**CHARGES, EXPLOSIVE, COMMERCIAL** *without detonator*	1.4S			P5, A69	**A5.21.**
	UN0271	**CHARGES, PROPELLING**	1.1C			P4	**A5.27.**
	UN0272	**CHARGES, PROPELLING**	1.3C			P4	**A5.27.**
	UN0415	**CHARGES, PROPELLING**	1.2C			P4	**A5.27.**
	UN0491	**CHARGES, PROPELLING**	1.4C			P5	**A5.27.**
	UN0414	**CHARGES, PROPELLING, FOR CANNON**	1.2C			P4	**A5.13.**
	UN0242	**CHARGES, PROPELLING, FOR CANNON**	1.3C			P4	**A5.13.**
	UN0279	**CHARGES, PROPELLING, FOR CANNON**	1.1C			P4	**A5.13.**
	UN0059	**CHARGES, SHAPED,** *without detonator*	1.1D			P4	**A5.21.**
	UN0439	**CHARGES, SHAPED,** *without detonator*	1.2D			P4	**A5.21.**
	UN0440	**CHARGES, SHAPED,** *without detonator*	1.4D			P5	**A5.21.**
	UN0441	**CHARGES, SHAPED, COMMERCIAL** *without detonator*	1.4S			P5, A69	**A5.21.**
	UN0237	**CHARGES, SHAPED, FLEXIBLE, LINEAR**	1.4D			P5, A69	**A5.22.**
	UN0288	**CHARGES, SHAPED, FLEXIBLE, LINEAR**	1.1D			P4, A69	**A5.22.**
	UN0060	**CHARGES, SUPPLEMENTARY, EXPLOSIVE**	1.1D			P4	**A5.16.**
	NA1760	**CHEMICAL KITS**	8	II		P5	**A12.6.**
	UN3316	**CHEMICAL KITS**	9			P5	**A13.18.**
	UN3315	**Chemical sample, toxic**					FORBIDDEN
	UN2075	**CHLORAL, ANHYDROUS, STABILIZED**	6.1	II		P5	**A10.5.**
	UN1458	**CHLORATE AND BORATE MIXTURES**	5.1	II III		P5, A9, N34 P5, A9, N34	**A9.6.** **A9.6.**
	UN1459	**CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLID**	5.1	II III		P5, A9, N34 P5, A9, N34	**A9.6.** **A9.6.**
	UN3407	**CHLORATE AND MAGNESIUM CHLORIDE MIXTURE SOLUTION**	5.1	II III		P5, A9, N34 P5, A9, N34	**A9.5.** **A9.5.**
	UN3210	**CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.**	5.1	II III		P5 P5	**A9.5.** **A9.5.**
	UN1461	**CHLORATES, INORGANIC, N.O.S.**	5.1	II		P5, A9, N34	**A9.6.**
	UN2626	**CHLORIC ACID AQUEOUS SOLUTION,** *with not more than 10% chloric acid*	5.1	II			FORBIDDEN
		Chloric acid, aqueous solution with more than 10% chloric acid					FORBIDDEN

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		Chloride of phosphourous; see **PHOSPHORUS TRICHLORIDE**					
		Chloride of sulphur; see **SULPHUR CHLORIDE**					
		Chlorinated lime; see **CALCIUM HYPOCHLORITE MIXTURES,** *etc*					
	UN1017	**CHLORINE**	2.3		8	P2, 2	**A6.4.**
		Chlorine azide					FORBIDDEN
D	NA9191	**Chlorine dioxide hydrate, frozen**	5.1		6.1		FORBIDDEN
		Chlorine dioxide ***(not hydrate)***					FORBIDDEN
	UN2548	**CHLORINE PENTAFLUORIDE**	2.3		5.1, 8	P1, 1, N86	**A6.4.**
	UN1749	**CHLORINE TRIFLUORIDE**	2.3		5.1, 8	P2, 2, N86	**A6.4.**
	UN1908	**CHLORITE SOLUTION**	8	II III		P5, A3, A6, A7, N34 P5, A3, A6, A7, N34	**A12.2.** **A12.2.**
	UN1462	**CHLORITES, INORGANIC, N.O.S.**	5.1	II		P5, A7, N34	**A9.6.**
	UN3250	**CHLOROACETIC ACID, MOLTEN**	6.1		8		FORBIDDEN
	UN1751	**CHLOROACETIC ACID, SOLID**	6.1	II	8	P5, A3, A7, N34	**A10.5.**
	UN1750	**CHLOROACETIC ACID, SOLUTION**	6.1	II	8	P4, A7, N34	**A10.4.**
	UN1695	**CHLOROACETONE, STABILIZED**	6.1	I	3, 8	P5, 2, N12, N32, N34	**A10.6.**
		Chloroacetone (unstabilized)					FORBIDDEN
+	UN2668	**CHLOROACETONITRILE**	6.1	II	3	P2, 2	**A10.6.**
	UN3416	**CHLOROACETOPHENONE, LIQUID**	6.1	II		P5, A3, N12, N32, N33	**A10.4.**
	UN1697	**CHLOROACETOPHENONE,** *(CN), solid*	6.1	II		P5, A3, N12, N32, N33, N34	**A10.5.**
	UN1752	**CHLOROACETYL CHLORIDE**	6.1	I	8	P2, 2, A3, A6, A7, N34, N43	**A12.11.**
	UN2019	**CHLOROANILINES, LIQUID**	6.1	II		P5	**A10.4.**
	UN2018	**CHLOROANILINES, SOLID**	6.1	II		P5	**A10.5.**
	UN2233	**CHLOROANISIDINES**	6.1	III		P5	**A10.5.**
	UN1134	**CHLOROBENZENE**	3	III		P5	**A7.2.**
		Chlorobenzol; see **CHLOROBENZENE**					
	UN2234	**CHLOROBENZOTRIFLUORIDES**	3	III		P5	**A7.2.**
	UN2235	**CHLOROBENZYL CHLORIDES, LIQUID**	6.1	III		P5	**A10.4.**
	UN3427	**CHLOROBENZYL CHLORIDES, SOLID**	6.1	III			**A10.5.**
	UN2688	**1-CHLORO-3-BROMOPROPANE**	6.1	III		P5	**A10.4.**
	UN1127	**CHLOROBUTANES**	3	II		P5	**A7.2.**
	UN3437	**CHLOROCRESOLS,SOLID**	6.1	II		P5	**A10.4.**
	UN2669	**CHLOROCRESOLS, SOLUTION**	6.1	II **III**		P5 P5	**A10.6.** **A10.6.**
		3-Chloro-4-diethylaminobenzenediazonium zinc chloride; see **SELF-REACTIVE SOLID TYPE D**					

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	UN1974	**CHLORODIFLUOROBROMO-METHANE** *or* **REFRIGERANT GAS R12B1**	2.2			P5	**A6.3., A6.4.**
	UN2517	**1-CHLORO-1, 1-DIFLUOROETHANES** *or* **REFRIGERANT GAS R142B**	2.1			P4	**A6.3., A6.4.**
	UN1018	**CHLORODIFLUOROMETHANE** *or* **REFRIGERANT GAS R22**	2.2			P5	**A6.3., A6.4.**
	UN1973	**CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE** *or* **REFRIGERANT GAS R502** *with fixed boiling point, with approximately 49% chlorodifluoromethane*	2.2			P5	**A6.3., A6.4.**
+	UN1577	**CHLORODINITROBENZENES, LIQUID**	6.1	II		P5	**A10.4.**
+	UN3441	**CHLORODINITROBENZENES, SOLID**	6.1	II		P5	**A10.5.**
		Chloroethane; see **ETHYL CHLORIDE**					
	UN2232	**2-CHLOROETHANAL**	6.1	I		P2, 2	**A10.6.**
	UN1888	**CHLOROFORM**	6.1	III		P5, N36	**A10.4.**
	UN2742	**CHLOROFORMATES**, **TOXIC, CORROSIVE, FLAMMABLE, N.O.S.**	6.1	II	8, 3	P2, 5	**A10.4.**
*	UN3277	**CHLOROFORMATES, TOXIC, CORROSIVE, N.O.S**.	6.1	II	8	P3	**A10.4.**
		Chloromethane; see **METHYL CHLORIDE**					
		1-Chloro-3-methylbutane; see **AMYL CHLORIDE**					
		2-Chloro-2-methylbutane; see **AMYL CHLORIDE**					
	UN2745	**CHLOROMETHYL CHLOROFORMATE**	6.1	II	8	P4	**A10.4.**
	UN2354	**CHLOROMETHYL ETHYL ETHER**	3	II	6.1	P4	**A7.2.**
	UN2236	**3-CHLORO-4-METHYLPHENYL ISOCYANATE**, **LIQUID**	6.1	II		P5	**A10.4.**
	UN3428	**3-CHLORO-4-METHYLPHENYL ISOCYANATE**, ***solid***	6.1	II		P5	**A10.5.**
	UN1021	**1-CHLOR0-1,2,2,2-TETRAFLUOROETHANE or REFRIGERANT GAS**	2.2			P5	**A6.3., A6.4.**
		1-Chloro-2-methylpropane; see **CHLOROBUTANES**					
		2 Chloro-2-methylopropane; see **CHLOROBUTANES**					
	UN2237	**CHLORONITROANILINES**	6.1	III		P5	**A10.5.**
+	UN3409	**CHLORONITROBENZENES, LIQUID,** *ortho*	6.1	II		P4	**A10.4.**
+	UN1578	**CHLORONITROBENZENES, SOLID,** *meta or para,*	6.1	II		P5	**A10.5.**
	UN2433	**CHLORONITROTOLUENES, LIQUID**	6.1	III		P5	**A10.4.**
	UN3457	**CHLORONITROTOLUENES, SOLID**	6.1	III		P5	**A10.5.**
	UN1020	**CHLOROPENTAFLUOROETHANE** *or* **REFRIGERANT GAS R115**	2.2			P5	**A6.3., A6.4.**
		3-Chloroperoxybenzoic acid,not less than 57% and no more than 86% when with more or equal to 14% inert.					FORBIDDEN
	UN2904	**CHLOROPHENOLATES, LIQUID,** *or* **PHENOLATES, LIQUID**	8	III		P5	**A12.2.**

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	UN2905	**CHLOROPHENOLATES, SOLID** *or* **PHENOLATES SOLID**	8	III		P5	**A12.3.**
	UN2021	**CHLOROPHENOLS, LIQUID**	6.1	III		P5	**A10.4.**
	UN2020	**CHLOROPHENOLS, SOLID**	6.1	III		P5	**A10.5.**
	UN1753	**CHLOROPHENYLTRICHLORO-SILANE**	8	II		P4, A7, N34	**A12.2.**
+	UN1580	**CHLOROPICRIN**	6.1	I		P2, 2	**A10.6.**
	UN1581	**CHLOROPICRIN AND METHYL BROMIDE MIXTURES**	2.3			P2, 2, N86	**A6.16.**
	UN1582	**CHLOROPICRIN AND METHYL CHLORIDE MIXTURES**	2.3			P2, 2, N86	**A6.16.**
		Chloropicrun mixture, flammable (pressure not exceeding 14.7 psia at 115 degrees F flashpoint below 100 degrees F); see **TOXIC LIQUIDS, FLAMMABLE,** *etc*					
	UN1583	**CHLOROPICRIN MIXTURES, N.O.S.**	6.1	I II III		P2, 5 P3 P5	**A10.4.** **A10.4.** **A10.4.**
D	NA9263	**CHLOROPIVALOYL CHLORIDE**	6.1	I	8	P2, 2	**A10.6.**
	UN2507	**CHLOROPLATINIC ACID, SOLID**	8	III		P5	**A12.3.**
	UN1991	**CHLOROPRENE, STABILIZED**	3	I	6.1	P3	**A7.2.**
		Chloroprene, unstabilized or uninhibited					FORBIDDEN
	UN1278	**1-CHLOROPROPANE**	3	II		P5, N34	**A7.2.**
	UN2356	**2-CHLOROPROPANE**	3	I		P3, N36	**A7.2.**
	UN2849	**3-CHLOROPROPANOL-1**	6.1	III		P5	**A10.4.**
	UN2456	**2-CHLOROPROPENE**	3	I		P3, A3, N36	**A7.2.**
	UN2511	**2-CHLOROPROPIONIC ACID**	8	III		P5	**A12.2.** **A12.3.**
	UN2822	**2-CHLOROPYRIDINE**	6.1	II		P5	**A10.4.**
	UN2987	**CHLOROSILANES, CORROSIVE N.O.S**.	8	II		P4	**A12.2.**
	UN2985	**CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.**	3	II	8	P4	**A7.2.**
	UN2986	**CHLOROSILANES, FLAMMABLE, CORROSIVE, N.O.S**.	8	II	3	P4	**A12.2.**
	UN3361	**CHLOROSILANES, TOXIC, CORROSIVE, N.O.S**.	6.1	II	8	P5	**A10.4.**
	UN3362	**CHLOROSILANES, TOXIC, CORROSIVE, FLAMMABLE N.O.S**.	6.1	II	3, 8	P5	**A10.4.**
	UN2988	**CHLOROSILANES, WATER-REACTIVE, FLAMMABLE, CORROSIVE, N.O.S.**	4.3	I	3, 8	P3, A2	**A8.2.**
+	UN1754	**CHLOROSULPHONIC ACID** *(with or without sulphur trioxide)*	8	I	6.1	P2, 2, A3, A6, A10	**A12.11.**
	UN1021	**1-CHLORO-1,2,2,2-TETRAFLUOROETHANE** *or* **REFRIGERANT GAS R124**	2.2			P5	**A6.3.**, **A6.4.**
	UN2238	**CHLOROTOLUENES**	3	III		P5	**A7.2.**
	UN1579	**4-CHLORO-O-TOLUIDINE HYDROCHLORIDE, SOLID**	6.1	III		P5	**A10.5.**

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	UN3410	**4-CHLORO-O-TOLUIDINE HYDROCHLORIDE, SOLUTION**	6.1	III		P5	**A10.4.**
	UN3429	**CHLOROTOLUIDINES, LIQUID**	6.1	III		P5	**A10.4.**
	UN2239	**CHLOROTOLUIDINES, SOLID**	6.1	III		P5	**A10.4.**, **A10.5.**
	UN1983	**1-CHLORO-2,2,2-TRIFLUOROETHANE** *or* **REFRIGERANT GAS R133A**	2.2			P5	**A6.3.**, **A6.4.**
	UN1022	**CHLOROTRIFLUOROMETHANE** *or* **REFRIGERANT GAS R13**	2.2			P5	**A6.3.**, **A6.4.**
	UN2599	**CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE** *or* **REFRIGERANT GAS R503** *with approximately 60% Chlorotrifluoromethane*	2.2			P5	**A6.3.**, **A6.4.**
	UN1755	**CHROMIC ACID, SOLUTION**	8	II III		P5 P5	**A12.2.** **A12.2.**
	UN1756	**CHROMIC FLUORIDE, SOLID**	8	II		P5	**A12.3.**
	UN1757	**CHROMIC FLUORIDE, SOLUTION**	8	II III		P5 P5	**A12.2.** **A12.2.**
	UN2720	**CHROMIUM NITRATE**	5.1	III		P5, A1, A29	**A9.6.**
	UN1758	**CHROMIUM OXYCHLORIDE**	8	I		P3, A3, A6, A7, N34	**A12.2.**
	UN1463	**CHROMIUM TRIOXIDE, ANHYDROUS**	5.1	II	6.1, 8	P5	**A9.6.**
	UN2240	**CHROMOSULFURIC ACID**	8	I		P3, A3, A6, A7, N34	**A12.2.**
		Chromyl chloride; see **CHROMIUM OXYCHLORIDE**					
		Cigar and cigarette lighters, charged with fuel, see **LIGHTERS**					
		Cleaning fluid or liquid; see **FLAMMABLE LIQUIDS**, *etc*					
		Coal briquettes, hot					FORBIDDEN
		Clinical Specimens, see **BIOLOGICAL SUBSTANCES, CATEGORY B**				A508	
	UN3291	**CLINICAL WASTE, UNSPECIFIED, N.O.S.**	6.2	II		P5, A117	**A10.10.**
	UN1023	**COAL GAS, COMPRESSED**	2.3		2.1	P2, 3	**A6.5.**
	UN1136	**COAL TAR DISTILLATES, FLAMMABLE**	3	II III		P5 P5	**A7.2.** **A7.2.**
		Coal tar dye, corrosive liquid, n.o.s.; see **DYES, LIQUID** *or* **SOLID N.O.S.** *or* **DYE INTERMEDIATES, LIQUID** *or* **SOLID N.O.S.**					
	UN1139	**COATING SOLUTION** *(includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining)*	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
	UN2001	**COBALT NAPHTHENATES, POWDER**	4.1	III		P5, A19	**A8.3.**
	UN1318	**COBALT RESINATE, PRECIPITATED**	4.1	III		P5, A1, A19	**A8.3.**
		Coke, hot					FORBIDDEN
*	UN0461	**COMPONENTS, EXPLOSIVE TRAIN, N.O.S.**	1.1B			P4	**A5.4.**
*	UN0382	**COMPONENTS, EXPLOSIVE TRAIN, N.O.S.**	1.2B			P4	**A5.4.**

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*	UN0383	**COMPONENTS, EXPLOSIVE TRAIN, N.O.S.**	1.4B			P5	**A5.4.**
*	UN0384	**COMPONENTS, EXPLOSIVE TRAIN, N.O.S.**	1.4S			P5, A69	**A5.4.**
*	NA1760	**COMPOUNDS, CLEANING LIQUID**	8	I II III		P3, A7 P5, N37 P5, N37	**A12.2.** **A12.2.** **A12.2.**
		Compounds, enamel; see **PAINT**, *etc*					
*	NA1760	**COMPOUNDS, TREE KILLING, LIQUID** *or* **COMPOUNDS WEED KILLING, LIQUID**	8	I II III		P3, A7 P5, N37 P5, N37	**A12.2.** **A12.2.** **A12.2.**
*	NA1993	**COMPOUNDS, TREE KILLING LIQUID** *or* **COMPOUNDS, WEED KILLING, LIQUID**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
*	NA2810	**COMPOUNDS, TREE KILLING LIQUID** *or* **COMPOUNDS, WEED KILLING, LIQUID**	6.1	I II III		P3 P5 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN1956	**COMPRESSED GAS, N.O.S.**	2.2			P5	**A6.3.**, **A6.4.**, **A6.5.**
*	UN1954	**COMPRESSED GAS, FLAMMABLE, N.O.S**.	2.1			P4	**A6.3.**, **A6.4.**
*	UN3156	**COMPRESSED GAS, OXIDIZING, N.O.S.**	2.2		5.1	P5	**A6.3.**, **A6.4.**,
*	UN3304	**COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.** *Inhalation Hazard Zone A*	2.3		8	P1, 1	**A6.15.**
*	UN3304	**COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.** *Inhalation Hazard Zone B*	2.3		8	P2, 2	**A6.4.**, **A6.5.**
*	UN3304	**COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.** *Inhalation Hazard Zone C*	2.3		8	P2, 3	**A6.4.**, **A6.5.**
*	UN3304	**COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.** *Inhalation Hazard Zone D*	2.3		8	P2, 4	**A6.4.**, **A6.5.**
*	UN3305	**COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.** *Inhalation Hazard Zone A*	2.3		2.1, 8	P1, 1	**A6.15.**
*	UN3305	**COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.** *Inhalation Hazard Zone B*	2.3		2.1, 8	P2, 2	**A6.4.**, **A6.5.**
*	UN3305	**COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.** *Inhalation Hazard Zone C*	2.3		2.1, 8	P2, 3	**A6.4.**, **A6.5.**
*	UN3305	**COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.** *Inhalation Hazard Zone D*	2.3		2.1, 8	P2, 4	**A6.4.**, **A6.5.**
*	UN1953	**COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.,** *Inhalation Hazard Zone A*	2.3		2.1	P1, 1	**A6.15.**
*	UN1953	**COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S**., *Inhalation Hazard Zone B*	2.3		2.1	P2, 2	**A6.4.**, **A6.5.**
*	UN1953	**COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.**, *Inhalation Hazard Zone C*	2.3		2.1	P2, 3	**A6.4.**, **A6.5.**
*	UN1953	**COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.,** *Inhalation Hazard Zone D*	2.3		2.1	P2, 4	**A6.4.**, **A6.5.**.
*	UN1955	**COMPRESSED GAS, TOXIC, N.O.S.,** *Inhalation Hazard Zone A*	2.3			P1, 1	**A6.15.**
*	UN1955	**COMPRESSED GAS, TOXIC, N.O.S**., *Inhalation Hazard Zone B*	2.3			P2, 2	**A6.4.**, **A6.5.**

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*	UN1955	**COMPRESSED GAS, TOXIC, N.O.S.,** *Inhalation Hazard Zone C*	2.3			P2, 3	**A6.4., A6.5.**
*	UN1955	**COMPRESSED, GAS, TOXIC, N.O.S.,** *Inhalation Hazard Zone D*	2.3			P2, 4	**A6.4., A6.5.**
*	UN3306	**COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S.** *Inhalation Hazard Zone A*	2.3		5.1, 8	P1, 1	**A6.15.**
*	UN3306	**COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S.** *Inhalation Hazard Zone B*	2.3		5.1, 8	P2, 2	**A6.4., A6.5.**
*	UN3306	**COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S.** *Inhalation Hazard Zone C*	2.3		5.1, 8	P2, 3	**A6.4., A6.5.**
*	UN3306	**COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S.** *Inhalation Hazard Zone D*	2.3		5.1, 8	P2, 4	**A6.4., A6.5.**
*	UN3303	**COMPRESSED, GAS, TOXIC, OXIDING, N.O.S.** *Inhalation Hazard Zone A*	2.3		5.1	P1, 1	**A6.15.**
*	UN3303	**COMPRESSED, GAS, TOXIC, OXIDING, N.O.S.** *Inhalation Hazard Zone B*	2.3		5.1	P2, 2	**A6.4.**
*	UN3303	**COMPRESSED, GAS, TOXIC, OXIDING, N.O.S.** *Inhalation Hazard Zone C*	2.3		5.1	P2, 3	**A6.4.**
*	UN3303	**COMPRESSED, GAS, TOXIC, OXIDING, N.O.S.** *Inhalation Hazard Zone D*	2.3		5.1	P2, 4	**A6.4.**
	ID8000	**CONSUMER COMMODITY**	9			P5, A503	**A13.3.**
D		**CONSUMER COMMODITY**	ORM-D			P5, A503, A504, A505	**A13.3.**
*	UN0248	**CONTRIVANCES, WATER-ACTIVATED**, *with burster, expelling charge or propelling charge*	1.2L			P3	**A5.28.**
*	UN0249	**CONTRIVANCES, WATER-ACTIVATED**, *with burster, expelling charge or propelling charge*	1.3L			P3	**A5.28.**
	UN1585	**COPPER ACETOARSENITE**	6.1	II		P5	**A10.5.**
		Copper acetylide					FORBIDDEN
		Copper amine azide					FORBIDDEN
	UN1586	**COPPER ARSENITE**	6.1	II		P5	**A10.5.**
*	UN2776	**COPPER BASED PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	I II	6.1 6.1	P3 P4	**A7.2.** **A7.2.**
*	UN3009	**COPPER BASED PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	I II III	3 3 3	P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN3010	**COPPER BASED PESTICIDES, LIQUID, TOXIC**	6.1	I II III		P3 P5 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN2775	**COPPER BASED PESTICIDES, SOLID, TOXIC**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
	UN2721	**COPPER CHLORATE**	5.1	II		P5, A1	**A9.6.**
	UN2802	**COPPER CHLORIDE**	8	III		P5	**A12.3.**
	UN1587	**COPPER CYANIDE**	6.1	II		P5	**A10.5.**
		COPPER SELENATE; *see* **SELENATES**					

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		COPPER SELENITE; *see* **SELENITES**					
		Copper tetramine nitrate					FORBIDDEN
	UN1363	COPRA	4.2				FORBIDDEN
	UN0065	**CORD, DETONATING**, *flexible*	1.1D			P4, 102, A69	**A5.23.**
	UN0289	**CORD, DETONATING**, *flexible*	1.4D			P5, A69	**A5.23.**
	UN0102	**CORD**, **DETONATING** *or* **FUSE, DETONATING**, *metal clad*	1.2D			P4, A69	**A5.23.**
	UN0290	**CORD, DETONATING** *or* **FUSE, DETONATING,** *metal clad*	1.1D			P4, A69	**A5.23.**
	UN0104	**CORD**, **DETONATING, MILD EFFECT** *or* **FUSE, DETONATING, MILD EFFECT**, *metal clad*	1.4D			P5, A69	**A5.23.**
	UN0066	**CORD, IGNITER**	1.4G			P5, A69	**A5.24.**
		Cordite, see **POWDER, SMOKELESS**					
		Corrosive battery fluid; see **BATTERY FLUID**, **ACID** *or* **BATTERY FLUID, ALKALI**					
*	UN3264	**CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.**	8	I		P3	**A12.2.**
				II		P4	**A12.2.**
				III		P5	**A12.2.**
*	UN3265	**CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.**	8	I		P3	**A12.2.**
				II		P4	**A12.2.**
				III		P5	**A12.2.**
*	UN3266	**CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.**	8	I		P3	**A12.2.**
				II		P4	**A12.2.**
				III		P5	**A12.2.**
*	UN3267	**CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.**	8	I		P3	**A12.2.**
				II		P4	**A12.2.**
				III		P5	**A12.2.**
*	UN2920	**CORROSIVE LIQUID, FLAMMABLE, N.O.S**.	8	I	3	P3	**A12.2.**
				II	3	P4	**A12.2.**
*	UN3301	**CORROSIVE LIQUID, SELF-HEATING, N.O.S.**	8	I	4.2	P3	**A12.2.**
				II	4.2	P4	**A12.2.**
*	UN1760	**CORROSIVE LIQUID, N.O.S.**	8	I		P3, A7	**A12.2.**
				II		P4	**A12.2.**
				III		P5	**A12.2.**
*	UN3093	**CORROSIVE LIQUID, OXIDIZING, N.O.S.**	8	I	5.1	P3	**A12.2.**
				II	5.1	P4	**A12.2.**
*	UN2922	**CORROSIVE LIQUID, TOXIC N.O.S.**	8	I	6.1	P3, A7	**A12.2.**
				II	6.1	P4	**A12.2.**
				III	6.1	P5	**A12.2.**
*	UN3094	**CORROSIVE LIQUID, WATER-REACTIVE**, **N.O.S.**	8	I	4.3	P3	**A12.2.**
				II	4.3	P4	**A12.2.**

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*	UN3260	**CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.**	8	I		P5	**A12.3.**
				II		P5	**A12.3.**
				III		P5	**A12.3.**
*	UN3261	**CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.**	8	I		P5	**A12.3.**
				II		P5	**A12.3.**
				III		P5	**A12.3.**
*	UN3262	**CORROSIVE SOLID, BASIC, INORGANIC, N.O.S**	8	I		P5	**A12.3.**
				II		P5	**A12.3.**
				III		P5	**A12.3.**
*	UN3263	**CORROSIVE SOLID, BASIC, ORGANIC, N.O.S**	8	I		P5	**A12.3.**
				II		P5	**A12.3.**
				III		P5	**A12.3.**
*	UN2921	**CORROSIVE SOLID, FLAMMABLE, N.O.S.**	8	I	4.1	P3	**A12.3.**
				II	4.1	P4	**A12.3.**
*	UN1759	**CORROSIVE SOLID, N.O.S.**	8	I		P5	**A12.3.**
				II		P5	**A12.3.**
				III		P5	**A12.3.**
*	UN3084	**CORROSIVE SOLID, OXIDIZING, N.O.S.**	8	I	5.1	P5	**A12.3.**
				II	5.1	P5	**A12.3.**
*	UN2923	**CORROSIVE SOLID, TOXIC N.O.S.**	8	I	6.1	P5	**A12.3.**
				II	6.1	P5	**A12.3.**
				III	6.1	P5	**A12.3.**
*	UN3095	**CORROSIVE SOLID, SELF-HEATING, N.O.S.**	8	I	4.2	P5	**A12.3.**
				II	4.2	P5	**A12.3.**
*	UN3096	**CORROSIVE SOLIDS, WATER-REACTIVE, N.O.S.**	8	I	4.3	P3	**A12.3.**
				II	4.3	P4	**A12.3.**
	UN1364	**COTTON WASTE, OILY**	4.2	III		P5	**A8.3.**
	UN1365	**COTTON, WET**					FORBIDDEN
D	NA1365	**COTTON**	9				FORBIDDEN
*	UN3024	**COUMARIN DERIVATIVE PESTICIDES, LIQUID**, **FLAMMABLE, TOXIC,** *flashpoint not less than 23 degrees C*	3	I	6.1	P3	**A7.2.**
				II	6.1	P4	**A7.2.**
*	UN3025	**COUMARIN DERIVATIVE PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint less than 23 degrees C*	6.1	I	3	P3	**A10.4.**
				II	3	P5	**A10.4.**
				III	3	P5	**A10.4.**
*	UN3026	**COUMARIN DERIVATIVE PESTICIDES, LIQUID**, **TOXIC**	6.1	I		P3	**A10.4.**
				II		P5	**A10.4.**
				III		P5	**A10.4.**
*	UN3027	**COUMARIN DERIVATIVE PESTICIDES, SOLID, TOXIC**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**

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	UN2076	**CRESOLS, LIQUID**	6.1	II	8	P5	**A10.4.**
	UN3455	**CRESOLS, SOLID**	6.1	II	8	P5	**A10.5.**.
	UN2022	**CRESYLIC ACID**	6.1	II	8	P5	**A10.4.**
	UN1143	**CROTONALDEHYDE, STABILIZED**	6.1	I	3	P2, 2	**A10.6.**
	UN2823	**CROTONIC ACID,** *liquid or solid*	8	III		P5	**A12.2.**, **A12.3.**
	UN1144	**CROTONYLENE**	3	I		P3	**A7.2.**
	UN1761	**CUPRIETHYLENEDIAMINE SOLUTION**	8	II III	6.1 6.1	P4 P5	**A12.2.** **A12.2.**
	UN0070	**CUTTERS, CABLE, EXPLOSIVE**	1.4S			P5, A69	**A5.18.**
		Cyanide or cyanide mixtures, dry; see **CYANIDES, INORGANIC, SOLID N.O.S.**					
*	UN1588	**CYANIDES, INORGANIC, SOLID N.O.S.**	6.1	I II III		P5, N74, N75 P5, N74, N75 P5, N74, N75	**A10.5.** **A10.5.** **A10.5.**
	UN1935	**CYANIDE SOLUTIONS, N.O.S.**	6.1	I II III		P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
	UN1889	**CYANOGEN BROMIDE**	6.1	I	8	P3, A6, A8	**A10.5.**
	UN1589	**CYANOGEN CHLORIDE, STABILIZED**	2.3		8	P1, 1	**A6.15.**
		Cyanogen Chloride, unstabilized					FORBIDDEN
	UN1026	**CYANOGEN**	2.3		2.1	P2, 2	**A6.15.**
	UN2670	**CYANURIC CHLORIDE**	8	II		P5	**A12.3.**
		Cyanuric triazide					FORBIDDEN
	UN2601	**CYCLOBUTANE**	2.1			P4	**A6.3.**, **A6.4.**
	UN2744	**CYCLOBUTYL CHLOROFORMATE**	6.1	II	3, 8	P4	**A10.4.**
	UN2518	**1,5,9-CYCLODODECATRIENE**	6.1	III		P5	**A10.4.**
	UN2241	**CYCLOHEPTANE**	3	II		P5	**A7.2.**
	UN2603	**CYCLOHEPTATRIENE**	3	II	6.1	P5	**A7.2.**
	UN2242	**CYCLOHEPTENE**	3	II		P5	**A7.2.**
	UN1145	**CYCLOHEXANE**	3	II		P5	**A7.2.**
	UN1915	**CYCLOHEXANONE**	3	III		P5	**A7.2.**
	UN2256	**CYCLOHEXENE**	3	II		P5	**A7.2.**
	UN1762	**CYCLOHEXENYLTRICHLORO-SILANE**	8	II		P4, A7, N34	**A12.2.**
	UN2243	**CYCLOHEXYL ACETATE**	3	III		P5	**A7.2.**
	UN2357	**CYCLOHEXYLAMINE**	8	II	3	P5	**A12.2.**
	UN2488	**CYCLOHEXYL ISOCYANATE**	6.1	I	3	P2, 2	**A10.6.**
	UN3054	**CYCLOHEXYL MERCAPTAN**	3	III		P5	**A7.2.**
	UN1763	**CYCLOHEXYLTRICHLOROSILANE**	8	II		P4, A7, N34	**A12.2.**
	UN0483	**CYCLONITE, DESENSITIZED**	1.1D			P4	**A5.7.**
	UN0391	**CYCLONITE AND CYCLOTETRAMETHYLENETRANITRAMINE MIXTURE, DESENSITIZED** ***with not less than 15% water by mass***	1.1D			P4	**A5.7.**

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	UN0391	**CYCLONITE AND CYCLOTETRAMETHYLENETRANITRAMINE MIXTURE, DESENSITIZED** ***with 10% or more phlegmatizer, by mass***	1.1D			P4	**A5.7.**
	UN0072	**CYCLONITE, WETTED** *with not less than 15% water by mass*	1.1D			P4	**A5.7.**
	UN2940	**CYCLOOCTADIENE PHOSPHINES**	4.2	II		P5, A19	**A8.3.**
	UN2520	**CYCLOOCTADIENES**	3	III		P5	**A7.2.**
	UN2358	**CYCLOOCTATETRAENE**	3	II		P5	**A7.2.**
	UN1146	**CYCLOPENTANE**	3	II		P5	**A7.2.**
		Cyclopentane, methyl; see **METHYLCYCLOPENTANE**					
	UN2244	**CYCLOPENTANOL**	3	III		P5	**A7.2.**
	UN2245	**CYCLOPENTANONE**	3	III		P5	**A7.2.**
	UN2246	**CYCLOPENTENE**	3	II		P5	**A7.2.**
	UN1027	**CYCLOPROPANE**	2.1			P4	**A6.3.**, **A6.4.**
	UN0484	**CYCLOTETRAMETHYLENETETRANITRAMINE, DESENSITIZED,** *or* **OCTOGEN, DESENSITIZED** *or* **HMX DESENSITIZED**	1.1D			P4	**A5.7.**
		Cyclotetramethylenetetranitramine (dry)					FORBIDDEN
	UN0226	**CYCLOTETRAMETHYLENETETRANITRAMINE, WETTED,** *or* **HMX, WETTED** *or* **OCTOGEN, WETTED** *with not less than 15% water, by mass*	1.1D			P4	**A5.7.**
		Cyclotetramethylenetetranitramine, HMX, or Octogen, Wetted with less than 15% water, by mass					FORBIDDEN
	UN0391	**CYCLOTRIMETHYLENETRINITRAMINE AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, WETTED** *with not less than 15% water by mass or* **HEXOGEN AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, WETTED** *with not less than 15% water by mass or* **RDX AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, WETTED** *with not less than 15% water by mass or* **CYCLONITE AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, WETTED** *with not less than 15% water by mass*	1.1D			P4	**A5.7.**

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	UN0391	**CYCLOTRIMETHYLENETRINITRAMINE AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, DESENSITIZED** *with not less than 10% phlegmatizer by mass or* **HEXOGEN AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, DESENSITIZED** *with not less than 10% phlegmatizer by mass or* **RDX AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, DESENSITIZED** *with not less than 10% phlegmatizer by mass or* **CYCLONITE AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, DESENSITIZED** *with not less than 10% phlegmatizer by mass or*	1.1D			P4	**A5.7.**
	UN0483	**CYCLOTRIMETHYLENETRINITRAMINE, DESENSITIZED,** *or* **CYCLONITE, DESENSITIZED,** *or* **HEXOGEN, DESENSITIZED**, *or* **RDX, DESENSITIZED**	1.1D			P4	**A5.7.**
	UN0072	**CYCLOTRIMETHYLENETRINITRAMINE, WETTED** *with not less than 15% water by mass,* *or* **CYCLONITE, WETTED** *with not less than 15% water by mass,* *or* **HEXOGEN, WETTED** *with not less than 15% water by mass,* *or* **RDX, WETTED** *with not less than 15% water by mass*	1.1D			P4	**A5.7.**
	UN2046	**CYMENES**	3	III		P5	**A7.2.**
	UN3363	**DANGEROUS GOODS IN APPARATUS** *or* **MACHINERY**	9			P5	**A13.13.**
	UN1868	**DECABORANE**	4.1	II	6.1	P5, A19, A20	**A8.3.**
	UN1147	**DECAHYDRONAPHTHALENE**	3	III		P5	**A7.2.**
	UN2247	**N-DECANE**	3	III		P5	**A7.2.**
	UN0132	**DEFLAGRATING METAL SALTS OF AROMATIC NITRODERIVATIVES, N.O.S.**	1.3C			P4	**A5.10.**
		Detonating relays; see **DETONATORS,** *etc*					
	UN3379	DESENSITIZED EXPLOSIVE, LIQUID, N.O.S.	3				FORBIDDEN
	UN3380	DESENSITIZED EXPLOSIVE, SOLID, N.O.S.	4.1				FORBIDDEN
	UN0360	**DETONATOR ASSEMBLIES, NON-ELECTRIC** *for blasting*	1.1B			P4, A69	**A5.15.**
	UN0361	**DETONATOR ASSEMBLIES, NON-ELECTRIC** *for blasting*	1.4B			P5, 103, A69	**A5.15.**
	UN0500	**DETONATOR ASSEMBLIES, NON-ELECTRIC** *for blasting*	1.4S	II		P5, A69	**A5.15.**
	UN0030	**DETONATORS, ELECTRIC**, *for blasting*	1.1B			P4, A69	**A5.14.**
	UN0255	**DETONATORS, ELECTRIC**, *for blasting*	1.4B			P5, A69	**A5.14.**
	UN0456	**DETONATORS, ELECTRIC**, *for blasting*	1.4S			P5, A69	**A5.14.**
	UN0073	**DETONATORS FOR AMMUNITION**	1.1B			P4	**A5.17.**
	UN0364	**DETONATORS FOR AMMUNTION**	1.2B			P4	**A5.17.**
	UN0365	**DETONATORS FOR AMMUNITION**	1.4B			P5, 103	**A5.17.**
	UN0366	**DETONATORS FOR AMMUNITION**	1.4S			P5, A69	**A5.17.**
	UN0029	**DETONATORS, NON-ELECTRIC**, *for blasting*	1.1B			P4, A69	**A5.15.**

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	UN0267	**DETONATORS, NON-ELECTRIC**, *for blasting*	1.4B			P5, 103, A69	**A5.15.**
	UN0455	**DETONATORS, NON-ELECTRIC**, *for blasting*	1.4S			P5, A69	**A5.15.**
	UN1957	**DEUTERIUM, COMPRESSED**	2.1			P4, N89	**A6.3.**, **A6.5.**
	UN3150	**DEVICES, SMALL, HYDROCARBON GAS POWERED** *or* **HYDROCARBON GAS REFILLS FOR SMALL DEVICES** *with release device*	2.1			P5	**A6.3.**, **A6.4.**
	UN1148	**DIACETONE ALCOHOL**	3	II III		P5 P5	**A7.2.** **A7.2.**
		Diacetyl, see **BUTANEDIONE**					
		Diagnostic Specimens, see **BIOLOGICAL SUBSTANCES, CATEGORY B**					
	UN2359	**DIALLYLAMINE**	3	II	6.1, 8	P4	**A7.2.**
	UN2360	**DIALLYL ETHER**	3	II	6.1	P4, N12	**A7.2.**
	UN2651	**4,4'-DIAMINODIPHENYL METHANE**	6.1	III		P5	**A10.5.**
	UN2841	**DI-N-AMYLAMINE**	3	III	6.1	P5	**A7.2.**
		p-Diazidobenzene					FORBIDDEN
		1,2-Diazidoethane					FORBIDDEN
		Diazoaminotetrazole (dry)					FORBIDDEN
		Diazodinitrophenol (dry)					FORBIDDEN
		1,1'-Diazoaminonaphthalene					FORBIDDEN
	UN0074	**DIAZODINITROPHENOL, WETTED** *with not less than 40% water, or mixture of alcohol and water, by mass*	1.1A			P4, 111, 117	**A5.5.**
		Diazodiphenylmethane					FORBIDDEN
		2-Diazo-1-Naphthol-5-Sulphonyl chloride					FORBIDDEN
		2-Diazo-1-Naphthol-4-Sulphonyl chloride					FORBIDDEN
		2-Diazo-1-Naphthol-4-Sulphochloride; see **SELF-REACTIVE SOLID TYPE B**					
		Diazonium nitrates (dry)					FORBIDDEN
		Diazonium perchlorates (dry)					FORBIDDEN
		1,3-Diazopropane					FORBIDDEN
		Dibenzoyl peroxide, with more than 51% when with less than or equal 48% inert solid					FORBIDDEN
		Dibenzoyl peroxide, with more than 77% and with less than 94% when with more or equal 6% water					FORBIDDEN
	UN2434	**DIBENZYLDICHLOROSILANE**	8	II		P5	**A12.2.**
	UN1911	**DIBORANE**	2.3		2.1	P1, 1, N89	**A6.5.**
D	NA1911	*Diborane mixtures*	2.1				FORBIDDEN
		Dibromoacetylene					FORBIDDEN
	UN2648	**1,2-DIBROMOBUTAN-3-ONE**	6.1	II		P5	**A10.4.**
	UN2872	**DIBROMOCHLOROPROPANE**	6.1	III		P5	**A10.4.**
	UN1941	**DIBROMODIFLUOROMETHANE, R12B2**	9	III		P5	**A13.2.**
		1,2-Dibromoethane; see **ETHYLENE DIBROMIDE**					
	UN2664	**DIBROMOMETHANE**	6.1	III		P5	**A10.4.**

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	UN2248	**DI-N-BUTYLAMINE**	8	II	3	P5	**A12.2.**
	UN2873	**DIBUTYLAMINOETHANOL**	6.1	III		P5	**A10.4.**
	UN1149	**DIBUTYL ETHERS**	3	III		P5	**A7.2.**
		2,2-Di-(tert-butylperoxy) butane, more than 55% in solution					FORBIDDEN
		1,1-Di-(tert-butylperoxy) cyclohexane, more than 80%					FORBIDDEN
		Di-n-butyl peroxydicarbonate, more than 52% in solution					FORBIDDEN
		Di-(tert-butylperoxy) phthalate, more than 55% in solution					FORBIDDEN
		1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclo hexane, more than 90%					FORBIDDEN
		N,N'-Dichlorazodicarbonamidine (salts of) (dry)					FORBIDDEN
		Di-2,4-Dichlorobenzoyl peroxide, with more than 75% with water					FORBIDDEN
	UN1764	**DICHLOROACETIC ACID**	8	II		P5, A3, A6, A7, N34	**A12.2.**
	UN2649	**1,3-DICHLOROACETONE**	6.1	II		P5	**A10.5.**
	UN1765	**DICHLOROACETYL CHLORIDE**	8	II		P5, A3, A6, A7, N34	**A12.2.**
		Dichloroacetylene					FORBIDDEN
+	UN1590	**DICHLOROANILINES, LIQUID**	6.1	II		P5	**A10.4.**
	UN3442	**DICHLOROANILINES, SOLID**	6.1	II		P5	**A10.5.**
+	UN1591	**O-DICHLOROBENZENE**	6.1	III		P5	**A10.4.**
		Di-4-chlorobenzoyl peroxide, less than or equal to 77%, when with greater or equal to 23% water					FORBIDDEN
	UN1916	**2,2'-DICHLORODIETHYL ETHER**	6.1	II	3	P5, N33, N34	**A10.4.**
	UN1028	**DICHLORODIFLUOROMETHANE** *or* **REFRIGERANT GAS R12**	2.2			P5	**A6.3.. A6.4.**
	UN2602	**DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE** *or* **REFRIGERANT GAS R500** *with approximately 74% dichlorodifluoromethane*	2.2			P5	**A6.3.. A6.4.**
	UN2249	**DICHLORODIMETHYL ETHER, SYMMETRICAL**	6.l	I	3	P3	**A10.4.**
	UN2362	**1,1-DICHLOROETHANE**	3	II		P5	**A7.2.**
		1,2-Dichloroethane; see **ETHYLENE DICHLORIDE**					
	UN1150	**1,2-DICHLOROETHYLENE**	3	II		P5	**A7.2.**
		Dichloroethyl sulphide					FORBIDDEN
	UN2465	**DICHLOROISOCYANURIC ACID, DRY** *or* **DICHLOROISOCYANURIC ACID SALTS**	5.1	II		P5	**A9.6.**
	UN2490	**DICHLOROISOPROPYL ETHER**	6.1	II		P5	**A10.4.**
	UN1593	**DICHLOROMETHANE**	6.1	III		P5, N36	**A10.4.**
	UN1029	**DICHLOROFLUOROMETHANE** *or* **REFRIGERANT GAS R21**	2.2			P5	**A6.3.. A6.4.**
	UN2650	**1,1-DICHLORO-1-NITROETHANE**	6.1	II		P5	**A10.4.**

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	UN1152	**DICHLOROPENTANES**	3	III		P5	**A7.2.**
	UN2250	**DICHLOROPHENYL ISOCYANATES**	6.1	II		P5	**A10.5.**
	UN1766	**DICHLOROPHENYLTRICHLORO-SILANE**	8	II		P4, A7, N34	**A12.2.**
	UN1279	**1,2-DICHLOROPROPANE**	3	II		P5, N36	**A12.2.**
	UN2750	**1,3-DICHLOROPROPANOL-2**	6.1	II		P5	**A10.4.**
	UN2047	**DICHLOROPROPENES**	3	II		P5	**A7.2.**
				III		P5	**A7.2.**
	UN2189	**DICHLOROSILANE**	2.3		2.1, 8	P2, 2	**A6.4.**
	UN1958	**1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHA NE** *or* **REFRIGERANT GAS R114**	2.2			P5	**A6.3.**. **A6.4.**
D	NA9264	**3,5 DICHLORO-2,4,6 TRIFLUOROPYRIDINE**	6.1	I		P2, 2	**A10.6.**
		Dichlorovinylchloroarsine					FORBIDDEN
		1,4-Dicyanobutane; see **ADIPONITRILE**					
		DICYCLOHEPTADIENE*; see* **2,5-NORBORNADIENE**					
	UN2565	**DICYCLOHEXYLAMINE**	8	III		P5	**A12.2.**
	UN2687	**DICYCLOHEXYLAMMONIUM NITRITE**	4.1	III		P5	**A8.3.**
		Dicyclohexyl perxoxydicarbonate more than 91%					FORBIDDEN
	UN2048	**DICYCLOPENTADIENE**	3	III		P5	**A7.2.**
		2,2-Di-(4,4-di-tert-butylperoxycyclohexyl) propane, more than 42% with inert solid					FORBIDDEN
		Di-2,4-dichlorobenzoyl peroxide, less than 77%, when with 23% or more water					FORBIDDEN
	UN2372	**1,2-DI-(DIMETHYLAMINO) ETHANE**	3	II		P5	**A7.2.**
	UN1465	**DIDYMIUM NITRATE**	5.1	III		P5, A1	**A9.6.**
D	NA1993	**DIESEL FUEL**	3	III		P5	**A7.2.**
	UN1202	**DIESEL FUEL***; also see* **GAS OIL**	3	III		P5	**A7.2.**
		Diethanol nitrosamine dinitrate (dry)					FORBIDDEN
	UN2373	**DIETHOXYMETHANE**	3	II		P5	**A7.2.**
	UN2374	**3,3-DIETHOXYPROPENE**	3	II		P5	**A7.2.**
	UN1154	**DIETHYLAMINE**	3	II	8	P4, N34	**A7.2.**
	UN2686	**2-DIETHYLAMINOETHANOL**	8	II	3	P5	**A12.2.**
	UN2684	**3-DIETHYLAMINOPROPYLAMINE**	3	III	8	P5	**A7.2.**
+	UN2432	**N,N-DIETHYLANILINE**	6.1	III		P5	**A10.4.**
	UN2049	**DIETHYLBENZENE**	3	III		P5	**A7.2.**
	UN2366	**DIETHYL CARBONATE**	3	III		P5	**A7.2.**
	UN1767	**DIETHYLDICHLOROSILANE**	8	II	3	P4, A7, N34	**A12.2.**
		Diethylene glycol dinitrate					FORBIDDEN
	UN0075	**DIETHYLENEGLYCOL DINITRATE, DESENSITIZED** *desensitized with not less than 25% nonvolatile water-insoluble phlegmatizer, by mass*	1.1D	II			FORBIDDEN
		Diethylgold bromide					FORBIDDEN
	UN2079	**DIETHYLENETRIAMINE**	8	II		P5	**A12.2.**
		N,N-Diethylethanolamine; see **DIETHYLAMINOETHANOL**					

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	UN1155	**DIETHYL ETHER** *or* **ETHYL ETHER**	3	I		P3	**A7.2.**
	UN2685	**N,N-DIETHYLETHYLENEDIAMINE**	8	II	3	P5	**A12.2.**
	UN1156	**DIETHYL KETONE**	3	II		P5	**A7.2.**
		Diethyl peroxydicarbonate, more than 27% in solution					FORBIDDEN
	UN1594	**DIETHYL SULPHATE**	6.1	II		P5	**A10.4.**
	UN2375	**DIETHYL SULPHIDE**	3	II		P5	**A7.2.**
	UN2751	**DIETHYLTHIOPHOSPHORYL CHLORIDE**	8	II		P5	**A12.3.**
	UN1366	**DIETHYLZINC**	4.2	I	4.3	P3	**A8.5.**
	UN1030	**1,1 DIFLUOROETHANE** *or* **REFRIGERANT GAS R152A**	2.1			P4	**A6.3.**. **A6.4.**
	UN1959	**1,1-DIFLUOROETHYLENE** *or* **REFRIGERANT GAS R1132A**	2.1			P4	**A6.3.**. **A6.4.**
	UN3252	**DIFLUOROMETHANE** *or* **REFRIGERANT GAS R32**	2.1			P4	**A6.3.**. **A6.4.**
	UN1768	**DIFLUOROPHOSPHORIC ACID, ANHYDROUS**	8	II		P5, A6, A7, N5, N34	**A12.2.**
		2,2-Dihydroperoxypropane, not more than 27% when with 73% or more inert solid					FORBIDDEN
	UN2376	**2,3-DIHYDROPYRAN**	3	II		P5	**A7.2.**
		1,8-Dihydroxy-2,4,5,7-tetranitroanthraquinone (chrysamminic acid)					FORBIDDEN
		Di-(1-hydroxytetrazole) (dry)					FORBIDDEN
		Diiodoacetyline					FORBIDDEN
	UN2361	**DIISOBUTYLAMINE**	3	III	8	P5	**A7.2.**
	UN2050	**DIISOBUTYLENE, ISOMETRIC COMPOUNDS**	3	II		P5	**A7.2.**
	UN1157	**DIISOBUTYL KETONE**	3	III		P5	**A7.2.**
	UN1902	**DIISOOCTYL ACID PHOSPHATE**	8	III		P5	**A12.2.**
	UN1158	**DIISOPROPYLAMINE**	3	II	8	P4	**A7.2.**
	UN1159	**DIISOPROPYL ETHER**	3	II		P5	**A7.2.**
		Diisopropyl peroxydicarbonate, more than 52%					FORBIDDEN
		Diisopopropylbenzene hydroperoxide, with more than 72 percent solution					FORBIDDEN
	UN2521	**DIKETENE, STABILIZED**	6.1	I	3	P2, 2	**A10.6.**
		Diketene, Unstabilized					FORBIDDEN
	UN2377	**1,1-DIMETHOXYETHANE**	3	II		P3	**A7.2.**
	UN2252	**1,2-DIMETHOXYETHANE**	3	II		P3	**A7.2.**
	UN1032	**DIMETHYLAMINE, ANHYDROUS**	2.1			P4, N87	**A6.4.**
	UN1160	**DIMETHYLAMINE SOLUTION**	3	II	8	P4	**A7.2.**
	UN2378	**2-DIMETHYLAMINOACETONITRILE**	3	II	6.1	P4	**A7.2.**
		4-dimethylamino-6-(2-dimethylaminoethoxy) toluene-2-diazonium zinc chloride; see **SELF-RELATIVE SOLID TYPE D, TEMPERATURE CONTROLLED**					
	UN3302	**2-DIMETHYLAMINOETHYL ACRYLATE**	6.1	II		P5	**A10.4.**
	UN2051	**2-DIMETHYLAMINOETHANOL**	8	II	3	P5	**A12.2.**

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	UN2522	**2-DIMETHYLAMINOETHYL METHACRYLATE**	6.1	II		P5	**A10.4.**
	UN2253	**N,N-DIMETHYLANILINE**	6.1	II		P5	**A10.4.**
		Di-(2-methylbenzol) peroxide, not more than 87% when with 13% or more water					FORBIDDEN
	UN2457	**2,3-DIMETHYLBUTANE**	3	II		P5	**A7.2.**
	UN2379	**1,3-DIMETHYLBUTYLAMINE**	3	II	8	P5	**A7.2.**
	UN2262	**DIMETHYLCARBAMOYL CHLORIDE**	8	II		P5	**A12.2.**
	UN1161	**DIMETHYL CARBONATE**	3	II		P5	**A7.2.**
	UN2263	**DIMETHYLCYCLOHEXANES**	3	II		P5	**A7.2.**
	UN2264	**N,N-DIMETHYLCYCLOHEXYLAMINE**	8	II	3	P5	**A12.2.**
		2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane, more than 82%					FORBIDDEN
		2,5-Dimethyl-2,5-di(tert-butylperoxy)hexyne-3mor e than 86%					FORBIDDEN
	UN1162	**DIMETHYLDICHLOROSILANE**	3	II	8	P5	**A7.2.**
	UN2380	**DIMETHYLDIETHOXYSILANE**	3	II		P5	**A7.2.**
		2,5-Dimethyl-2,5-dihydroperoxy hexane, more than 82% with water					FORBIDDEN
	UN2707	**DIMETHYLDIOXANES**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN2381	**DIMETHYL DISULPHIDE**	3	II		P5	**A7.2.**
	UN1033	**DIMETHYL ETHER**	2.1			P4	**A6.3.**, **A6.4.**
	UN2265	**N,N-DIMETHYFORMAMIDE**	3	III		P5	**A7.2.**
		Dimethylhexane dihydroperoxide, more than 82% with water					FORBIDDEN
	UN2382	**DIMETHYLHYDRAZINE, SYMMETRICAL**	6.1	I	3	P2, 2, A7	**A10.6.**
	UN1163	**DIMETHYLHYDRAZINE, UNSYMMETRICAL**	6.1	I	3, 8	P2, 2	**A10.6.**
	UN2044	**2,2-DIMETHYLPROPANE**	2.1			P4	**A6.3.**, **A6.4.**
	UN2266	**DIMETHYL-N-PROPYLAMINE**	3	II	8	P5	**A7.2.**
	UN1595	**DIMETHYL SULPHATE**	6.1	I	8	P2, 2	**A10.6.**
	UN1164	**DIMETHYL SULPHIDE**	3	II		P5	**A7.2.**
	UN2267	**DIMETHYL THIOPHOSPHORYL CHLORIDE**	6.1	II	8	P5	**A10.4.**
	UN1370	**DIMETHYLZINC**	4.2	I	4.3	P3	**A8.5.**
	UN0489	**DINGU;** *see* **DINITROGLYCOLURIL**	1.1D			P4	**A5.8.**
	UN1596	**DINITROANILINES**	6.1	II		P5	**A10.5.**
	UN1597	**DINITROBENZENES**, **LIQUID**	6.1	II III		P5 P5	**A10.4.** **A10.4.**
	UN3443	**DINITROBENZENES, SOLID**	6.1	II		P5	**A10.6.**
	UN1598	**DINITRO-O-CRESOL**, *solid or solution*	6.1	II		P5	**A10.4.**, **A10.5.**
		1,3-Dinitro-4,5-dinitrosobenzene					FORBIDDEN
		1,2-Dinitroethane					FORBIDDEN
	UN1067	**DINITROGEN TETROXIDE**	2.3		5.1, 8		FORBIDDEN
	UN0489	**DINITROGLYCOLURIL** *or* **DINGU**	1.1D			P4	**A5.8.**

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		Dinitromethane					FORBIDDEN
	UN0077	**DINITROPHENOLATES**, *alkali metals, dry or wetted with less than 15% water, by mass*	1.3C		6.1	P4	**A5.10.**
	UN1321	**DINITROPHENOLATES, WETTED** *with not less than 15% water, by mass*	4.1	I	6.1	P4, 23, A8, A19, A20, N41	**A8.3.**
		Dinitropropylene glycol					FORBIDDEN
	UN0076	**DINITROPHENOL**, *dry or wetted with less than 15% water, by mass*	1.1D		6.1	P4	**A5.7.**
	UN1599	**DINITROPHENOL SOLUTIONS**	6.1	II III		P5 P5	**A10.4.** **A10.4.**
	UN1320	**DINITROPHENOL, WETTED** *with not less than 15% water, by mass*	4.1	I	6.1	P4, 23, A8, A19, A20, N41	**A8.3.**
		Dinitropropylene glycol					FORBIDDEN
	UN0078	**DINITRORESORCINOL,** *dry or wetted with less than 15% water, by mass*	1.1D			P4	**A5.7.**
		4,6-Dinitroresorcinol (heavy metal salts of) (dry)					FORBIDDEN
		2,4-Dinitroresorcinol (heavy metal salts of) (dry)					FORBIDDEN
	UN1322	**DINITRORESORCINOL, WETTED** *with not less than 15% water, by mass*	4.1	I		P4, 23, A8, A19, A20, N41	**A8.3.**
		3,5-Dinitrosalicylic acid (lead salt) (dry)					FORBIDDEN
	UN0406	**DINITROSOBENZENE**	1.3C			P4	**A5.10.**
		Dinitrosobenzylamidine and salts of (dry)					FORBIDDEN
		2,2-Dinitrostilbene					FORBIDDEN
		1,4-Dinitro-1,1,4,4-tetramethylolbutane tetranitrate (dry)					FORBIDDEN
	UN2038	**DINITROTOLUENES, LIQUID**	6.1	II		P5	**A10.4.**
	UN1600	**DINITROTOLUENES, MOLTEN**					FORBIDDEN
	UN3454	**DINITROTOLUENES, SOLID**	6.1	II		P5	**A10.5.**
		2,4-Dinitro-1,3,5-trimethylbenzene					FORBIDDEN
		Di-(beta-nitroxyethyl)ammonium nitrate					FORBIDDEN
		a,a-Di-(nitroxy) methylether					FORBIDDEN
		1,9-Dinitroxy pentamethylene-2,4,6,8-tetramine					FORBIDDEN
	UN1165	**DIOXANE**	3	II		P5	**A7.2.**
	UN1166	**DIOXOLANE**	3	II		P5	**A7.2.**
	UN2052	**DIPENTENE**	3	III		P5	**A7.2.**
		Di-(2-phenoxyethyl) peroxydicarbonate, more than 85%					FORBIDDEN
	UN1698	**DIPHENYLAMINE CHLOROARSINE**	6.1	I		P3	**A10.4.**
	UN1699	**DIPHENYLCHLOROARSINE, LIQUID**	6.1	I		P3, A8, N33, N34	**A10.4.**
	UN3450	**DIPHENYLCHLOROARSINE, SOLID**	6.1	I		P3, A8, N33, N34	**A10.5.**
	UN1769	**DIPHENYLDICHLOROSILANE**	8	II		P4, A7, N34	**A12.2.**
	UN2489	**DIPHENYLMETHANE-4,4'-DIISOCYANATE**	6.1	III		P5	**A10.4.**
	UN1770	**DIPHENYLMETHYL BROMIDE**	8	II		P5	**A12.3.**

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	UN0079	*Dipicrylamine; see* **HEXANITRODIPHENYLAMINE**	1.1D			P4	**A5.7.**.
	UN0401	**DIPICRYL SULPHIDE**, *dry or wetted with less than 10% water, by mass*	1.1D			P4	**A5.7.**
	UN2852	**DIPICRYL SULPHIDE, WETTED** *with not less than 10% water, by mass*	4.1	I		P4, A2, N41	**A8.3.**
	UN2383	**DIPROPYLAMINE**	3	II	8	P4	**A7.2.**
	UN2384	**DI-N-PROPYL ETHER**	3	II		P5	**A7.2.**
	UN2710	**DIPROPYL KETONE**	3	III		P5	**A7.2.**
*	UN1903	**DISINFECTANTS, LIQUID, CORROSIVE, N.O.S**	8	I II III		P3, A7 P5 P5	**A12.2.** **A12.2.** **A12.2.**
*	UN3142	**DISINFECTANTS, LIQUID, TOXIC, N.O.S.**	6.1	I II III		P3, A4 P5 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN1601	**DISINFECTANTS, SOLID, TOXIC, N.O.S.**	6.1	II III		P5 P5	**A10.5.** **A10.5.**
	UN3253	**DISODIUM TRIOXOSILICATE**	8	III		P5	**A12.3.**
*		**DISPERSANT GASES; N.O.S.** *see* **REFRIGERANT GASES, N.O.S.**					
	UN1167	**DIVINYL ETHER, STABILIZED**	3	I		P3	**A7.2.**
		Divinyl ether, unstabilized					FORBIDDEN
	UN1771	**DODECYLTRICHLOROSILANE**	8	II		P4, A7, N34	**A12.2.**
		DRY ICE, *see* **CARBON DIOXIDE SOLID**					
*	UN2801	**DYES, LIQUID, CORROSIVE, N.O.S.,** *or* **DYE INTERMEDIATES, LIQUID, CORROSIVE, N.O.S**	8	I II III		P5, 11 P5, 11 P5, 11	**A12.2.** **A12.2.** **A12.2.**
*	UN1602	**DYES, LIQUID, TOXIC, N.O.S.,** *or* **DYE INTERMEDIATES, LIQUID, TOXIC, N.O.S**	6.1	II III		P4 P5	**A10.4.** **A10.4.**
*	UN3147	**DYES, SOLID, CORROSIVE, N.O.S.,** *or* **DYE INTERMEDIATES, SOLID, CORROSIVE N.O.S.**	8	I II III		P5 P5 P5	**A12.3.** **A12.3.** **A12.3.**
*	UN3143	**DYES, SOLID, TOXIC, N.O.S.,** *or* **DYE INTERMEDIATES, SOLID, TOXIC, N.O.S.**	6.1	I II III		P5, A5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
		Dynamite; see **EXPLOSIVE, BLASTING, TYPE A**					
		Electrolyte (acid or alkali) for batteries; see **BATTERY FLUID, ACID** *or* **BATTERY FLUID, ALKALI**					
	UN3256	*ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S., with flashpoint above 60.5C, at or above its flashpoint*					FORBIDDEN

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	UN3257	*ELEVATED TEMPERATURE LIQUID, N.O.S., at or above100 C,and below its flashpoint (including molten metals, molten salts, etc.)*					FORBIDDEN
	UN3258	*ELEVATED TEMPERATURE SOLID, N.O.S., at or above 240 C*					FORBIDDEN
	UN3166	**ENGINES, INTERNAL COMBUSTION**, *Flammable gas powered*	9			P5, 135	**A13.5.**
	UN3166	**ENGINES, INTERNAL COMBUSTION,** *flammable liquid powered*	9			P5, 135	**A13.5.**
*	UN3082	**ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.**	9	III		P5, 8	**A13.2.**
*	UN3077	**ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.**	9	III		P5, 8	**A13.2.**
	UN2558	**EPIBROMOHYDRIN**	6.1	I	3	P3	**A10.4.**
+	UN2023	**EPICHLOROHYDRIN**	6.1	II	3	P5	**A10.4.**
	UN2752	**1,2-EPOXY-3-ETHOXYPROPANE**	3	III		P5	**A7.2.**
*	UN3272	**ESTERS, N.O.S.**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN1035	**ETHANE**	2.1			P4	**A6.3.**, **A6.4.**
	UN1961	**ETHANE, REFRIGERATED LIQUID**					FORBIDDEN
D	NA1961	**ETHANE-PROPANE MIXTURE, REFRIGERATED LIQUID**	2.1				FORBIDDEN
		Ethanol amine dinitrate					FORBIDDEN
	UN2491	**ETHANOLAMINE** *or* **ETHANOLAMINE SOLUTIONS**	8	III		P5	**A12.2.**
	UN1170	**ETHANOL** *or* **ETHANOL SOLUTIONS** or **ETHYL ALCOHOL** *or* **ETHYL ALCOHOL SOLUTIONS**	3	II III		P5, A58 P5, A58	**A7.2.** **A7.2.**
		Ether; see **DIETHYL ETHER**					
*	UN3271	**ETHERS, N.O.S.**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN1173	**ETHYL ACETATE**	3	II		P5	**A7.2.**
	UN2452	**ETHYLACETYLENE, STABILIZED**	2.1			P4, N88	**A6.4.**
		Ethylacetylene, unstabilized					FORBIDDEN
	UN1917	**ETHYL ACRYLATE, STABILIZED**	3	II		P5	**A7.2.**
		ETHYL ALCOHOL *see* **ETHANOL**					
		Ethyl aldehyde; see **ACETALDEHYDE**					
	UN1036	**ETHYLAMINE**	2.1			P4, N87	**A6.14.**
	UN2270	**ETHYLAMINE, AQUEOUS SOLUTIONS** *with not less than 50%, but not more than 70% ethylamine*	3	II	8	P5	**A7.2.**
	UN2271	**ETHYL AMYL KETONE**	3	III		P5	**A7.2.**
	UN2272	**N-ETHYLANILINE**	6.1	III		P5	**A10.4.**
	UN2273	**2-ETHYLANILINE**	6.1	III		P5	**A10.4.**
	UN1175	**ETHYLBENZENE**	3	II		P5	**A7.2.**
	UN2274	**N-ETHYL-N-BENZYLANILINE**	6.1	III		P5	**A10.4.**
	UN2753	**N-ETHYLBENZYLTOLUIDINES LIQUID**	6.1	III		P5	**A10.4.**

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	UN3460	**N-ETHYLBENZYLTOLUIDINES SOLID**	6.1	III		P5	**A10.5.**
	UN1176	**ETHYL BORATE**	3	II		P5	**A7.2.**
	UN1891	**ETHYL BROMIDE**	6.1	II		P5	**A10.4.**
	UN1603	**ETHYL BROMOACETATE**	6.1	II	3	P4	**A10.4.**
	UN2275	**2-ETHYLBUTANOL**	3	III		P5	**A7.2.**
	UN1177	**2-ETHYLBUTYL ACETATE**	3	III		P5	**A7.2.**
	UN1179	**ETHYL BUTYL ETHER**	3	II		P5	**A7.2.**
	UN1178	**2-ETHYLBUTYRALDEHYDE**	3	II		P5	**A7.2.**
	UN1180	**ETHYL BUTYRATE**	3	III		P5	**A7.2.**
	UN1037	**ETHYL CHLORIDE**	2.1			P4 , N86	**A6.12.**
	UN1181	**ETHYL CHLOROACETATE**	6.1	II	3	P5	**A10.4.**
	UN1182	**ETHYL CHLOROFORMATE**	6.1	I	3, 8	P3, 2, A3, A6, A7, N34	**A10.6.**
	UN2935	**ETHYL 2-CHLOROPROPIONATE**	3	III		P5	**A7.2.**
+	UN2826	**ETHYL CHLOROTHIOFORMATE**	8	II	3, 6.1	P2, 2	**A12.11.**
	UN1862	**ETHYL CROTONATE**	3	II		P5	**A7.2.**
	UN1892	**ETHYLDICHLOROARSINE**	6.1	I		P2, 2	**A10.6.**
	UN1183	**ETHYLDICHLOROSILANE**	4.3	I	3, 8	P3, A2, A3, A7, N34	**A8.2.**
	UN3138	**ETHYLENE, ACETYLENE AND PROPYLENE IN MIXTURES, REFRIGERATED LIQUID** *(cryogenic liquids) containing at least 71.5% ethylene with not more than 22.5% acetylene and not more than 6% propylene*	2.1				FORBIDDEN
	UN1135	**ETHYLENE CHLOROHYDRIN**	6.1	I	3	P2, 2	**A10.6.**
	UN1962	**ETHYLENE**	2.1			P4	**A6.3.**, **A6.4.**
	UN1604	**ETHYLENEDIAMINE**	8	II	3	P5	**A12.2.**
		Ethylene diamine diperchlorate					FORBIDDEN
	UN1605	**ETHYLENE DIBROMIDE**	6.1	I		P2, 2	**A10.6.**
	UN1184	**ETHYLENE DICHLORIDE**	3	II	6.1	P4	**A7.2.**
	UN1153	**ETHYLENE GLYCOL DIETHYL ETHER**	3	III		P5	**A7.2.**
		Ethylene glycol dinitrate					FORBIDDEN
	UN1171	**ETHYLENE GLYCOL MONOETHYL ETHER**	3	III		P5	**A7.2.**
	UN1172	**ETHYLENE GLYCOL MONOETHYL ETHER ACETATE**	3	III		P5	**A7.2.**
	UN1188	**ETHYLENE GLYCOL MONOMETHYL ETHER**	3	III		P5	**A7.2.**
	UN1189	**ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE**	3	III		P5	**A7.2.**
	UN1185	**ETHYLENEIMINE, STABILIZED**	6.1	I	3	P1, 1, N25, N32	**A10.6.**
		Ethyleneimine, unstabilized					FORBIDDEN
	UN3300	**ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE** *with more than 87% ethylene oxide*	2.3		2.1	P2, 4	**A6.4.**
	UN1041	**ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE** *with more than 9% but not more than 87% ethylene oxide*	2.1			P4	**A6.3.**, **A6.4.**

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	UN1952	**ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE** *with not more than 9% ethylene oxide*	2.2			P5	**A6.3.**, **A6.4.**
	UN3297	**ETHYLENE OXIDE AND CHLOROTETRAFLUORO- ETHANE MIXTURE** *with not more than 8.8% ethylene oxide*	2.2			P5	**A6.3.**, **A6.4.**
	UN3070	**ETHYLENE OXIDE AND DICHLORODIFLUORO- METHANE MIXTURE** *with not more than 12.5% ethylene oxide*	2.2			P5	**A6.3.**, **A6.4.**
	UN3298	**ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE** *with not more than 7.9% ethylene oxide*	2.2			P5	**A6.3.**, **A6.4.**
	UN2983	**ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURES**, *not more than 30% ethylene oxide*	3	I	6.1	P2, 5, A11, N4, N34	**A7.2.**
		Ethylene oxide and propylene oxide mixture, more than 30% ethylene oxide					FORBIDDEN
	UN3299	**ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE** *with not more than 5.6% ethylene oxide*	2.2			P5	**A6.3.**, **A6.4.**
	UN1040	**ETHYLENE OXIDE**, *or* **ETHYLENE OXIDE WITH NITROGEN** up to a total pressure of 1 MPA (10 bar) at 50 degrees C	2.3		2.1	P2, 4	**A6.13.**
	UN1038	**ETHYLENE, REFRIGERATED LIQUID** *(cryogenic liquid)*	2.1			P3	**A6.11.**
		ETHYL ETHER*; see* **DIETHYL ETHER**					
	UN1155	**ETHYL ETHER**	3	I		P3	**A7.2.**
	UN2453	**ETHYL FLUORIDE** *or* **REFRIGERANT GAS R161**	2.1			P4	**A6.3.**, **A6.4.**
	UN1190	**ETHYL FORMATE**	3	II		P5	**A7.2.**
	UN2276	**2-ETHYLHEXYLAMINE**	3	III	8	P5	**A7.2.**
	UN2748	**2-ETHYLHEXYL CHLOROFORMATE**	6.1	II	8	P5	**A10.4.**
		Ethyl hydroperoxide					FORBIDDEN
	UN2385	**ETHYL ISOBUTYRATE**	3	II		P5	**A7.2.**
+	UN2481	**ETHYL ISOCYANATE**	3	I	6.1	P1, 1, A7	**A7.5.**
	UN1192	**ETHYL LACTATE**	3	III		P5	**A7.2.**
	UN2363	**ETHYL MERCAPTAN**	3	I		P3	**A7.2.**
	UN2277	**ETHYL METHACRYLATE, STABILIZED**	3	II		P5	**A7.2.**
	UN1039	**ETHYL METHYL ETHER**	2.1			P4	**A6.21.**
	UN1193	**ETHYL METHYL KETONE** *or* **METHYL ETHYL KETONE**	3	II		P5	**A7.2.**
		Ethyl nitrate					FORBIDDEN
		Ethyl nitrite					FORBIDDEN
	UN1194	**ETHYL NITRITE SOLUTIONS**	3		6.1		FORBIDDEN
	UN2524	**ETHYL ORTHOFORMATE**	3	III		P5	**A7.2.**
	UN2525	**ETHYL OXALATE**	6.1	III		P5	**A10.4.**
		Ethyl perchlorate					FORBIDDEN
	UN2435	**ETHYLPHENYLDICHLOROSILANE**	8	II		P5, A7, N34	**A12.2.**

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D	NA2927	**ETHYL PHOSPHONOTHIOIC DICHLORIDE, ANHYDROUS**	6.1	I	8	P2, 2	**A10.6.**
D	NA2845	**ETHYL PHOSPHONOUS DICHLORIDE, ANHYDROUS** *pyrophoric liquid*	6.1	I	4.2	P2, 2	**A10.6.**
D	NA2927	**ETHYL PHOSPHORODICHLORIDATE**	6.1	I	8	P2, 2	**A10.6.**
	UN2386	**1-ETHYLPIPERIDINE**	3	II	8	P5	**A7.2.**
	UN1195	**ETHYL PROPIONATE**	3	II		P5	**A7.2.**
	UN2615	**ETHYL PROPYL ETHER**	3	II		P5	**A7.2.**
		Ethyl sulphate; see **DIETHYL SULPHATE**					
	UN2435	**ETHYLPHENYLIDICHLOROSILANE**	8	II		P5, A7, N34	**A12.2.**
	UN2754	**N-ETHYLTOLUIDINES**	6.1	II		P5	**A10.4.**
	UN1196	**ETHYLTRICHLOROSILANE**	3	II	8	P4, A7, N34	**A7.2.**
		Etiologic agent; see **INFECTIOUS SUBSTANCES,** *etc.*					
	UN0081	**EXPLOSIVE, BLASTING,TYPE A**	1.1D			P4, A69	**A5.12.**
	UN0082	**EXPLOSIVE, BLASTING,TYPE B**	1.1D			P4, A69	**A5.12.**
	UN0331	**EXPLOSIVE, BLASTING,TYPE B** *or* **AGENT BLASTING TYPE B**	1.5D			P4, 105, 106, A69	**A5.12.**
	UN0083	**EXPLOSIVE, BLASTING,TYPE C**	1.1D			P4, 123, A69	**A5.12.**
	UN0241	**EXPLOSIVE, BLASTING,TYPE E**	1.1D			P4, A69	**A5.12.**
	UN0332	**EXPLOSIVE, BLASTING,TYPE E** *or* **AGENT BLASTING TYPE E**	1.5D			P4, 105, 106, A69	**A5.12.**
	UN0084	**EXPLOSIVE, BLASTING,TYPE D**	1.1D			P4, A69	**A5.12.**
		Explosives, slurry; see **EXPLOSIVE, BLASTING, TYPE E**					
		Explosives substances; see **SUBSTANCES, EXPLOSIVE, N.O.S.** *etc.*					
		Explosives, water gels; see **EXPLOSIVE, BLASTING, TYPE E**					
	UN1169	**EXTRACTS, AROMATIC, LIQUID**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN1197	**EXTRACTS, FLAVORING, LIQUID**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN1606	**FERRIC ARSENATE**	6.1	II		P5	**A10.5.**
	UN1607	**FERRIC ARSENITE**	6.1	II		P5	**A10.5.**
	UN1773	**FERRIC CHLORIDE, ANHYDROUS**	8	III		P5	**A12.3.**
	UN2582	**FERRIC CHLORIDE, SOLUTION**	8	III		P5	**A12.2.**
	UN1466	**FERRIC NITRATE**	5.1	III		P5, A1, A29	**A9.6.**
	UN1323	**FERROCERIUM**	4.1	II		P5, A19	**A8.3.**
	UN1408	**FERROSILICON**, *with 30% or more, but less than 90% silicon*	4.3	III	6.1	P5, A1, A19	**A8.3.**
	UN1608	**FERROUS ARSENATE**	6.1	II		P5	**A10.5.**
D	NA1759	**FERROUS CHLORIDE, SOLID**	8	II		P5	**A12.3.**
D	NA1760	**FERROUS CHLORIDE, SOLUTION**	8	II		P5	**A12.2.**

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	UN2793	**FERROUS METAL BORINGS;** *or* **FERROUS METAL SHAVINGS;** *or* **FERROUS METAL TURNINGS,** *or* **FERROUS METAL CUTTINGS** *in a form liable to self-heating*	4.2	III		P5, A1, A19	**A8.3.**
	UN1043	**FERTILIZER AMMONIATING SOLUTION** *with free ammonia*	2.2			P5, N87	**A6.3.**, **A6.4.**
	UN1372	**FIBERS, ANIMAL *or* FIBERS, VEGETABLE *burnt,, wet or damp***	4.2	III			FORBIDDEN
	UN3360	**FIBERS, VEGETABLE, DRY**	4.1	III		P5	**A8.3.**
	UN1373	**FIBRES** *or* **FABRICS, ANIMAL** *or* **VEGETABLE,** *or* **SYNTHETIC N.O.S.** *with animal or vegetable oil*	4.2	III		P5	**A8.3.**
	UN1353	**FIBERS** *or* **FIBER IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S**	4.1	III		P5, A1	**A8.3.**
		Films, nitrocellulose base, from which gelatine has been removed; film scrap; see **CELLULOID SCRAP**					
	UN1324	**FILMS, NITROCELLULOSE BASE**, *gelatine coated (except scrap)*	4.1	III		P5	**A8.12.**
	UN1774	**FIRE EXTINGUISHER CHARGES**, *corrosive liquid*	8	II		P5, N41	**A12.2.**
		Fire extinguisher charges, expelling,explosive; see **CARTRIDGES, POWER DEVICE**					
	UN1044	**FIRE EXTINGUISHERS** *containing compressed or liquefied gas*	2.2			P5	**A6.7.**
	UN2623	**FIRELIGHTERS, SOLID** *with flammable liquid*	4.1	III		P5, A1, A19	**A8.3.**
	UN0333	**FIREWORKS**	1.1G			P4, 108	**A5.19.**
	UN0334	**FIREWORKS**	1.2G			P4, 108	**A5.19.**
	UN0335	**FIREWORKS**	1.3G			P4, 108	**A5.19.**
	UN0336	**FIREWORKS**	1.4G			P5, 108	**A5.19.**
	UN0337	**FIREWORKS**	1.4S			P5, 108	**A5.19.**
	UN3316	**FIRST AID KITS**	9			P5	**A13.18.**
	UN2216	**FISH MEAL, STABILIZED *or* FISH SCRAP, STABILIZED**	9	III		P5	**A13.2.**
	UN1374	**FISH MEAL**, **UNSTABILZED,** *or* **FISH SCRAP, UNSTABILIZED**	4.2	II		P5, A1, A19	**A8.3.**
		Flammable compressed gas (small receptacles not fitted with a dispersion device, not refillable); see **RECEPTACLES,** *etc.*					
		Flammable gas in lighters; see **LIGHTERS** *or* **LIGHTER REFILLS** *containing flammable gas*					
*	UN2924	**FLAMMABLE LIQUIDS, CORROSIVE, N.O.S.**	3	I II III	8 8 8	P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
*	UN1993	**FLAMMABLE LIQUIDS, N.O.S.**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**

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*	UN1992	**FLAMMABLE LIQUIDS, TOXIC, N.O.S.**	3	I	6.1	P3	**A7.2.**
				II	6.1	P4	**A7.2.**
				III	6.1	P5	**A7.2.**
*	UN3286	**FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.**	3	I	6.1, 8	P3	**A7.2.**
				II	6.1, 8	P4	**A7.2.**
*	UN3180	**FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.**	4.1	II	8	P5, A1	**A8.3.**
				III	8	P5, A1	**A8.3.**
*	UN2925	**FLAMMABLE SOLIDS, CORROSIVE, ORGANIC, N.O.S.**	4.1	II	8	P5, A1	**A8.3.**
				III	8	P5, A1	**A8.3.**
*	UN3178	**FLAMMABLE SOLID, INORGANIC, N.O.S.**	4.1	II		P5, A1	**A8.3.**
				III		P5, A1	**A8.3.**
*	UN1325	**FLAMMABLE SOLIDS, ORGANIC, N.O.S.**	4.1	II		P5, A1	**A8.3.**
				III		P5, A1	**A8.3.**
*	UN3176	**FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.**					FORBIDDEN
*	UN3097	**FLAMMABLE SOLID, OXIDIZING, N.O.S.**					FORBIDDEN
*	UN3179	**FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.**	4.1	II	6.1	P5, A1	**A8.3.**
				III	6.1	P5, A1	**A8.3.**
*	UN2926	**FLAMMABLE SOLIDS, TOXIC, ORGANIC, N.O.S.**	4.1	II	6.1	P5, A1	**A8.3.**
				III	6.1	P5, A1	**A8.3.**
	UN0093	**FLARES, AERIAL**	1.3G			P4	**A5.19.**
	UN0403	**FLARES, AERIAL**	1.4G			P5	**A5.19.**
	UN0404	**FLARES, AERIAL**	1.4S			P5, A69	**A5.19.**
	UN0420	**FLARES, AERIAL**	1.1G			P4	**A5.19.**
	UN0421	**FLARES, AERIAL**	1.2G			P4	**A5.19.**
		Flares, aeroplane; see **FLARES, AERIAL**					
		Flares, signal; see **CARTRIDGES, SIGNAL**					
		Flares, highway or railway; see **SIGNAL DEVICES, HAND**					
	UN0418	**FLARES, SURFACE**	1.1G			P4	**A5.19.**
	UN0419	**FLARES, SURFACE**	1.2G			P4	**A5.19.**
	UN0092	**FLARES, SURFACE**	1.3G			P4	**A5.19.**
		Flares, water-activated; see **CONTRIVANCES, WATER-ACTIVATED,** *etc.*					
	UN0094	**FLASH POWDER**	1.1G			P4	**A5.9.**
	UN0305	**FLASH POWDER**	1.3G			P4	**A5.9.**
	UN1045	**FLUORINE, COMPRESSED**	2.3		5.1, 8	P1, 1, N86	**A6.6.**
	UN2642	**FLUOROACETIC ACID**	6.1	I		P5	**A10.5.**
	UN2941	**FLUOROANILINES**	6.1	III		P5	**A10.4.**
	UN2387	**FLUOROBENZENE**	3	II		P5	**A7.2.**
	UN1775	**FLUOROBORIC ACID**	8	II		P5, A6, A7, N3, N34	**A12.2.**
	UN1776	**FLUOROPHOSPHORIC ACID, ANHYDROUS**	8	II		P5, A6, A7, N3, N34	**A12.2.**

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	UN2856	**FLUOROSILICATES, N.O.S.**	6.1	III		P5	**A10.5.**
	UN1778	**FLUOROSILICIC ACID**	8	II		P5, A6, A7, N3, N34	**A12.2.**
	UN1777	**FLUOROSULPHONIC ACID**	8	I		P3, A3, A6, A7, A10, N3	**A12.2.**
	UN2388	**FLUOROTOLUENES**	3	II		P5	**A7.2.**
	UN2209	**FORMALDEHYDE SOLUTIONS** *with not less than 25% formaldehyde*	8	III		P5	**A12.2.**
	UN1198	**FORMALDEHYDE SOLUTIONS, FLAMMABLE**	3	III	8	P5	**A7.2.**
		Formalin; see **FORMALDEHYDE, SOLUTIONS**					
	UN1779	**FORMIC ACID**	8	II		P5	**A12.2.**
	UN0099	**FRACTURING DEVICES, EXPLOSIVE**, *without detonators for oil wells*	1.1D			P4	**A5.18.**
	UN1863	**FUEL, AVIATION, TURBINE ENGINE**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
		Fuel devices, lanterns, heaters, etc., see **DANGEROUS GOODS IN APPARATUS** *or* **MACHINERY**					
D	NA1993	**FUEL OIL** *(No, 1, 2, 3, 4, 5, or 6)*	3	III		P5	**A7.2.**
		Fulminate of mercury (dry)					FORBIDDEN
		Fulminate of mercury, wet; see **MERCURY FULMINATE**, *etc.*					
		Fulminating gold					FORBIDDEN
		Fulminating mercury					FORBIDDEN
		Fulminating platinum					FORBIDDEN
		Fulminating silver					FORBIDDEN
		Fulminic acid					FORBIDDEN
	UN1780	**FUMARYL CHLORIDE**	8	II		P5	**A12.2.**
	UN2389	**FURAN**	3	I		P3	**A7.2.**
	UN1199	**FURALDEHYDE**	6.1	II	3	P2	**A10.4.**
	UN2874	**FURFURYL ALCOHOL**	6.1	III		P5	**A10.4.**
	UN2526	**FURFURYLAMINE**	3	III	8	P5	**A7.2.**
	UN0290	**FUSE, DETONATING**, *metal clad*	1.1D			P4, A69	**A5.23.**
	UN0102	**FUSE, DETONATING, *metal clad***	1.2D			P4, A69	**A5.23.**
	UN0104	**FUSE DETONATING, MILD EFFECT**, *metal clad*	1.4D			P5, A69	**A5.23.**
	UN0103	**FUSE, IGNITER**, *tubular metal clad*	1.4G			P5	**A5.24.**
	UN0101	**FUSE, NONDETONATING** *(instantaneous or Quickmatch)*	1.3G			P4	**A5.24.**
		Fusee, matches; see **MATCHES, FUSEE**					
		Fusees, railway or highway, explosive; see **SIGNAL DEVICES, HAND**					
D	NA1325	**FUSEE** *(railway or highway)*	4.1	II		P5	**A8.13.**

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	UN1201	**FUSEL OIL**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN0105	**FUSE, SAFETY**	1.4S			P5, A69	**A5.24.**
		Fuses, tracer; see **TRACERS FOR AMMUNITION**					
		Fuzes, combination, percussion and time;see **FUZES, DETONATING** *or* **FUZES, IGNITING**					
	UN0106	**FUZES, DETONATING**	1.1B			P4	**A5.25.**
	UN0107	**FUZES, DETONATING**	1.2B			P4	**A5.25.**
	UN0257	**FUZES, DETONATING**	1.4B			P5, 116	**A5.25.**
	UN0367	**FUZES, DETONATING**	1.4S			P5, 116, A69	**A5.25.**
	UN0408	**FUZES, DETONATING**, *with protective features*	1.1D			P4	**A5.25.**
	UN0409	**FUZES, DETONATING**, *with protective features*	1.2D			P4	**A5.25.**
	UN0410	**FUZES, DETONATING**, *with protective features*	1.4D			P5, 116	**A5.25.**
	UN0316	**FUZES, IGNITING**	1.3G			P4	**A5.25.**
	UN0317	**FUZES, IGNITING**	1.4G			P4	**A5.25.**
	UN0368	**FUZES, IGNITING**	1.4S			P5, A69	**A5.25.**
		Galactan trinitrate					FORBIDDEN
	UN2803	**GALLIUM**	8	III		P3	**A12.7.**
	UN2037	**GAS CARTRIDGE,** *(flammable) without a release device, non-refillable*	2.1			P4	**A6.3.**, **A6.4.**
	UN2037	**GAS CARTRIDGES,** ***(non-flammable) without release device, non-refillable***	2.2			P5	**A6.3.**., **A6.4.**.
	UN2037	**GAS CARTRIDGES,** ***(oxidizing) without a release device, non-refillable***	2.2		5.1	P5	**A6.3.**., **A6.4.**.
	UN2037	**GAS CARTRIDGES,** ***(toxic) without a release device, non-refillable***	2.3				FORBIDDEN
	UN2037	**GAS CARTRIDGES,** ***(toxic and corrosive) without a release device, non-refillable***	2.3		8		FORBIDDEN
	UN2037	**GAS CARTRIDGES,** ***(toxic and flammable) without a release device, non-refillable***	2.3		2.1		FORBIDDEN
	UN2037	**GAS CARTRIDGES,** ***(toxic and oxidizing) without a release device, non-refillable***	2.3		5.1		FORBIDDEN
	UN2037	**GAS CARTRIDGES,** ***(toxic, flammable and corrosive) without a release device, non-refillable***	2.3		2.1, 8		FORBIDDEN
	UN2037	**GAS CARTRIDGES,** ***(toxic, oxidizing and corrosive) without a release device, non-refillable***	2.3		5.1, 8		FORBIDDEN
	ID8013	**GAS GENERATOR ASSEMBLIES (AIRCRAFT)**, *containing a nonflammable, nontoxic gas and a propellant cartridge*	2.2			P5	**A6.22.**
D	NA9035	**GAS IDENTIFICATION SET,** *must be classified and labeled according to the hazard class of the constituent(s)*	2.3			P2, 6	**A6.16.**
	UN1202	**GAS OIL** *or* **DIESEL FUEL** *or* **HEATING OIL, LIGHT**	3	III		P5	**A7.2.**
D	NA1203	**GASOHOL** ***gasoline mixed with ethyl alcohol, with not more than 20 percent alcohol***	3	II		P5	**A7.2.**
	UN1203	**GASOLINE**	3	II		P5	**A7.2.**

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*	UN3312	**GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S.** *(cryogenic liquid*	2.1			P3	**A6.11.**
*	UN3158	**GAS, REFRIGERATED LIQUID, N.O.S.** *(cryogenic liquid)*	2.2			P4	**A6.11.**
*	UN3311	**GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S.** *(cryogenic liquid)*	2.2		5.1	P4	**A6.11.**
	UN3167	**GAS SAMPLE, NONPRESSURIZED, FLAMMABLE, N.O.S.,** *not refrigerated liquid*	2.1			P4	**A6.3.**, **A6.4.**, **A6.5.**
	UN3168	**GAS SAMPLE, NONPRESSURIZED, TOXIC, FLAMMABLE, N.O.S.,** *not refrigerated liquid*	2.3		2.1	P3	**A6.3.**, **A6.4.**
	UN3169	**GAS SAMPLE, NONPRESSURIZED, TOXIC, N.O.S.,** *not refrigerated liquid*	2.3			P4	**A6.3.**, **A6.4.**, **A6.5.**
		Gelatine, blasting; see **EXPLOSIVE**, **BLASTING, TYPE A**					
		Gelatine dynamites; see **EXPLOSIVE, BLASTING, TYPE A**					
	UN3245	**GENETICALLY MODIFIED MICRO-ORGANISMS**	9			P5, A	**A10.8.**
	UN2192	**GERMANE**	2.3		2.1	P2, 2	**A6.15.**
		Glycerol-1,3-dinitrate					FORBIDDEN
		Glycerol gluconate trinitrate					FORBIDDEN
		Glycerol lactate trinitrate					FORBIDDEN
	UN2689	**GLYCEROL ALPHA-MONOCHLOROHYDRIN**	6.1	III		P5	**A10.4.**
		Glyceryl trinitrate; see **NITROGLYCERIN,** *etc*.					
	UN2622	**GLYCIDALDEHYDE**	3	II	6.1	P5	**A7.2.**
	UN0284	**GRENADES**, *hand or rifle, with bursting charge*	1.1D			P4	**A5.25.**
	UN0285	**GRENADES**, *hand or rifle, with bursting charge*	1.2D			P4	**A5.25.**
	UN0292	**GRENADES,** *hand or rifle, with bursting charge*	1.1F			P4	**A5.25.**
	UN0293	**GRENADES**, *hand or rifle, with bursting charge*	1.2F			P4	**A5.25.**
		Grenades, illuminating; see **AMMUNITION, ILLUMINATING,** *etc.*					
	UN0452	**GRENADES, PRACTICE**, *hand or rifle*	1.4G			P5	**A5.25.**
	UN0110	**GRENADES, PRACTICE**, *hand or rifle*	1.4S			P5, A69	**A5.25.**
	UN0318	**GRENADES, PRACTICE**, *hand or rifle*	1.3G			P4	**A5.25.**
	UN0372	**GRENADES, PRACTICE**, *hand or rifle*	1.2G			P4	**A5.25.**
		Grenades, smoke; see **AMMUNITION, SMOKE**, *etc.*					
	UN1467	**GUANIDINE NITRATE**	5.1	III		P5, A1	**A9.6.**
		Guanyl nitrosaminoguanylidene hydrazine (dry)					FORBIDDEN
	UN0113	**GUANYL NITROSAMINOGUANYLIDENE HYDRAZINE, WETTED** *with not less than 30% water, by mass*	1.1A			P3, 111, 117	**A5.5.**
		Guanyl nitrosaminoguanylidene hydrazine, wetted with less than 30% water					FORBIDDEN
		Guanyl nitrosaminoguanyltetrazene (dry)					FORBIDDEN

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	UN0114	**GUANYL NITROSAMINOGUANYLTETRAZENE**, **WETTED;** *or* **TETRAZENE, WETTED** *with not less than 30% water, or mixture of alcohol and water, by mass*	1.1A			P3, 111, 117	**A5.5.**
		Guanyl nitrosaminoguanyltetrazene, wetted with less than 30% water or mixture of alcohol and water					FORBIDDEN
		GUNPOWDER, COMPRESSED *or* **GUNPOWDER IN PELLETS**; *see* **BLACK POWDER** *(UN0028)*					
	UN0027	**GUNPOWDER,** ***granular or as meal***	1.1D			P4	**A5.9.**
	UN0028	**GUNPOWDER, COMPRESSED** *or* **GUNPOWDER, IN PELLETS**	1.1D			P4	**A5.9.**
	UN2545	**HAFNIUM POWDER, DRY**	4.2	I II III		P3 P5, A19, A20, N34 P5	**A8.3.** **A8.3.** **A8.3.**
	UN1326	**HAFNIUM POWDER, WETTED** *with not less than 25% water (a visible excess of water must be present) (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns*	4.1	II		P5, A6, A19, A20, N34	**A8.3.**
D*	NA3082	**HAZARDOUS WASTE, LIQUID, N.O.S.**	9	III		P5	**A13.2.**
D*	NA3077	**HAZARDOUS WASTE, SOLID, N.O.S**.	9	III		P5	**A13.2.**
	UN1202	**HEATING OIL LIGHT**	3	III		P5	**A7.2.**
		Heat producing article battery operated equipment, such as underwater torches or soldering equipment, which, if accidentally activated, will generate extreme heat and cause fire					FORBIDDEN
	UN1046	**HELIUM, COMPRESSED**	2.2			P5	**A6.3.**, **A6.5.**
		Helium, liquid, non-pressurized					FORBIDDEN
		Helium-oxygen mixture; see **RARE GASES AND OXYGEN MIXTURES COMPRESSED**					
	UN1963	**HELIUM, REFRIGERATED LIQUID***(cryogenic liquid)*	2.2			P5	**A6.11.**
	UN3296	**HEPTAFLUOROPROPANE** *or* **REFRIGERANT GAS R227**	2.2			P5	**A6.3.**, **A6.4.**
	UN3056	**N-HEPTALDEHYDE**	3	III		P5	**A7.2.**
		n-Heptanal; *see* **N-HEPTALDEHYDE**					
	UN1206	**HEPTANES**	3	II		P5	**A7.2.**
	UN2278	**N-HEPTENE**	3	II		P5	**A7.2.**
	UN2661	**HEXACHLOROACETONE**	6.1	III		P5	**A10.4.**
	UN2729	**HEXACHLOROBENZENE**	6.1	III		P5	**A10.4.**
	UN2279	**HEXACHLOROBUTADIENE**	6.1	III		P5	**A10.4.**
	UN2646	**HEXACHLOROCYCLOPENTADIENE**	6.1	I		P2, 2	**A10.6.**
	UN2875	**HEXACHLOROPHENE**	6.1	III		P5	**A10.5.**
	UN1781	**HEXADECYLTRICHLOROSILANE**	8	II		P4, A7, N34	**A12.2.**
	UN2458	**HEXADIENES**	3	II		P5	**A7.2.**

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	UN1612	**HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURES**	2.3			P2, 3	**A6.18.**
	UN1611	**HEXAETHYL TETRAPHOSPHATE,** *liquid or solid*	6.1	II		P5, N76	**A10.4.**, **A10.5.**
	UN2420	**HEXAFLUOROACETONE**	2.3		8	P2, 2	**A6.4.**
	UN2552	**HEXAFLUOROACETONE HYDRATE**, **LIQUID**	6.1	II		P5	**A10.4.**
	UN3436	**HEXAFLUOROACETONE HYDRATE**, **SOLID**	6.1	II		P5	**A10.5.**
	UN2193	**HEXAFLUOROETHANE** or **REFRIGERANT GAS R116**	2.2			P5	**A6.3.**, **A6.4.**
	UN1782	**HEXAFLUOROPHOSPHORIC ACID**	8	II		P5, A6, A7, N3, N34	**A12.2.**
	UN1858	**HEXAFLUOROPROPYLENE, COMPRESSED** *or* **REFRIGERANT GAS R1216**	2.2			P5	**A6.3.**, **A6.4.**
	UN1207	**HEXALDEHYDE**	3	III		P5	**A7.2.**
	UN2280	**HEXAMETHYLENEDIAMINE, SOLID**	8	III		P5	**A12.3.**
	UN1783	**HEXAMETHYLENEDIAMINE SOLUTION**	8	II III		P5 P5	**A12.2.** **A12.2.**
	UN2281	**HEXAMETHYLENE DIISOCYANATE**	6.1	II		P5	**A10.4.**
	UN2493	**HEXAMETHYLENEIMINE**	3	II	8	P5	**A7.2.**
	UN1328	**HEXAMETHYLENETETRAMINE**	4.1	III		P5, A1	**A8.3.**
		Hexamethylene triperoxide diamine (dry)					FORBIDDEN
		Hexamethylol benzene hexanitrate					FORBIDDEN
		3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane, more than 52%					FORBIDDEN
	UN1208	**HEXANES**	3	II		P5	**A7.2.**
		Hexanitroazoxy benzene					FORBIDDEN
		2,2,4,4,6,6-Henanitro-3,3-dihyroxyazobenzene (dry)					FORBIDDEN
	UN0079	**HEXANITRODIPHENYLAMINE** *or* **DIPICRYLAMINE** *or* **HEXYL**	1.1D			P4	**A5.7.**
		2,3,4,4,6,6-Henanitrodiphenylether					FORBIDDEN
		N,N'-(Hexanitrodiphenyl) ethylene dinitramine (dry)					FORBIDDEN
		Hexanitrodiphenyl urea					FORBIDDEN
		Hexanitroethane					FORBIDDEN
		Hexanitrooxanilide					FORBIDDEN
	UN0392	**HEXANITROSTILBENE**	1.1D			P4	**A5.7.**
	UN2282	**HEXANOLS**	3	III		P5	**A7.2.**
	UN2370	**1-HEXENE**	3	II		P5	**A7.2.**
	UN0391	***HEXOGEN AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, DESENSITIZED with not less than 10% phlegmatizer, by mass***	1.1D			P4	**A5.7.**

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	UN0391	***HEXOGEN AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, WETTED with not less than 15% water, by mass***	1.1D			P4	**A5.7.**
	UN0483	**HEXOGEN, DESENSITIZED**	1.1D			P4	**A5.7.**
	UN0072	**HEXOGEN, WETTED,** ***with not less than 15% water, by weight***	1.1D			P4	**A5.7.**
		HEXOGEN; *see* **CYCLOTRIMETHYLENETRI-NITRAMINE** *etc.*					
	UN0118	**HEXOLITE**, *or* **HEXOTOL** *dry or wetted with less than 15% water, by mass*	1.1D			P4	**A5.7.**
	UN0393	**HEXOTONAL**	1.1D			P4	**A5.7.**
	UN0079	**HEXYL**; *see* **HEXANITRODIPHENYLAMINE**	1.1D			P4	**A5.7.**
	UN1784	**HEXYLTRICHLOROSILANE**	8	II		P4, A7, N34	**A12.2.**
	UN0484	**HMX, DESENSITIZED**	1.1D			P4	**A5.7.**
	UN0226	**HMX, WETTED,** ***with not less than 15% water, by weight***	1.1D			P4	**A5.7.**
	UN2029	**HYDRAZINE, ANHYDROUS**	8	I	3, 6.1	P3, A3, A6, A7, A10	**A12.2.**
		Hydrazine azide					FORBIDDEN
		Hydrazine chlorate					FORBIDDEN
		Hydrazine dicarbonic acid diazide					FORBIDDEN
	UN3293	**HYDRAZINE, AQUEOUS SOLUTION** *with not more than 37% hydrazine, by mass*	6.1	III		P5	**A10.4.**
	UN2030	**HYDRAZINE HYDRATE** *or* **HYDRAZINE AQUEOUS SOLUTIONS**, *with more than 37% by weight*	8	II III	6.1 6.1	P4 P4	**A12.2.** **A12.2.**
		Hydrazine perchlorate					FORBIDDEN
		Hydrazine selenate					FORBIDDEN
		Hydriodic acid, anhydrous; see **HYDROGEN IODIDE, ANHYDROUS**					
	UN1787	**HYDRIODIC ACID**	8	II III		P5, A3, A6, N41 P5	**A12.2.** **A12.2.**
		Hydrobromic acid, anhydrous; see **HYDROGEN BROMIDE, ANHYDROUS**					
	UN1788	**HYDROBROMIC ACID, SOLUTION**, *more than 49% strength*	8	II III		P4, N41 P5	**A12.2.** **A12.2.**
	UN1788	**HYDROBROMIC ACID, SOLUTION**, *not more than 49% strength*	8	II III		P5, A3, A6, N41 P5	**A12.2.** **A12.2.**
*	UN1964	**HYDROCARBON GAS, MIXTURES COMPRESSED, N.O.S.**	2.1			P4	**A6.3.**, **A6.5.**
*	UN1965	**HYDROCARBON GAS, MIXTURES, LIQUEFIED**, **N.O.S**	2.1			P4	**A6.3.**, **A6.4.**
	UN3150	**HYDROCARBON GAS REFILLS FOR SMALL DEVICES,** ***with release devices***	2.1			P5	**A6.3.**, **A6.4.**

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	UN3295	**HYDROCARBONS, LIQUID, N.O.S.**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
	UN1789	**HYDROCHLORIC ACID**	8	II III		P4, A3, A6, N41 P5	**A12.2.** **A12.2.**
		Hydrocyanic acid, aqueous solution, more than 20% hydrogen cyanide					FORBIDDEN
		Hydrocyanic acid, anhydrous; see **HYDROGEN CYANIDE,** *etc.*					
	UN1613	**HYDROCYANIC ACID, AQUEOUS SOLUTIONS** *or* **HYDROGEN CYANIDE, AQUEOUS SOLUTIONS** *not more than 20% hydrogen cyanide*	6.1	I			FORBIDDEN
	UN1786	**HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURES**	8	I	6.1	P3, A6, A7, N5, N34	**A12.2.**
		Hydrofluoric acid, anhydrous; see **HYDROGEN FLUORIDE, ANHYDROUS**					
	UN1790	**HYDROFLUORIC ACID,** *with more than 60% strength*	8	I	6.1	P3, A6, A7, N5, N34	**A12.2.**
	UN1790	**HYDROFLUORIC ACID,** *with not more than 60% strength*	8	II	6.1	P4, A6, A7, N5, N34	**A12.2.**
		Hydrofluosilicic acid; see **FLUOROSILICIC ACID**					
	UN2034	**HYDROGEN AND METHANE MIXTURES, COMPRESSED**	2.1			P4, N89	**A6.3.**, **A6.5.**
	UN1048	**HYDROGEN BROMIDE, ANHYDROUS**	2.3		8	P2, 3, N86, N89	**A6.4.**
	UN1050	**HYDROGEN CHLORIDE, ANHYDROUS**	2.3		8	P2, 3, N86, N89	**A6.4.**
	UN2186	**HYDROGEN CHLORIDE, REFRIGERATED LIQUID**	2.3		8		FORBIDDEN
	UN1049	**HYDROGEN, COMPRESSED**	2.1			P4, N89	**A6.3.**, **A6.5.**
	UN3294	**HYDROGEN CYANIDE, SOLUTION IN ALCOHOL,** ***with not more than 45% of hydrogen cyanide***	6.1		3		FORBIDDEN
	UN1051	**HYDROGEN CYANIDE, STABILIZED,** ***with less than 3% water***	6.1		3		FORBIDDEN
	UN1614	**HYDROGEN CYANIDE, STABILIZED,** ***containing less than 3% water and absorbed in a porous inert material***	6.1				FORBIDDEN
		Hydrogen cyanide, unstabilized					FORBIDDEN
	UN1740	**HYDROGENDIFLUORIDES, SOLID, N.O.S** ***or*** **HYDROGENDIFLUORIDES, SOLUTION N.O.S.**	8	II III		P5, N3, N34 P5, N3, N34	**A12.2.**, **A12.3.** **A12.2.**, **A12.3.**
	UN1052	**HYDROGEN FLUORIDE, ANHYDROUS**	8	I	6.1	P2, 3, N86	**A12.8.**
	UN3468	**HYDROGEN IN METAL HYDRIDE STORAGE SYSTEM**	2.1				FORBIDDEN
	UN2197	**HYDROGEN IODIDE, ANHYDROUS**	2.3			P2, 3, N89	**A6.4.**
		Hydrogen iodide solution; see **HYDRIODIC ACID, SOLUTION**					

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	UN3149	**HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURES**, **STABILIZED** *with acids, water and not more than 5% peroxyacetic acid,*	5.1	II	8	P5, A2, A3, A6	**A9.5.**
	UN2014	**HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS** *with more than 40%, but not more than 60% hydrogen peroxide*	5.1		8		FORBIDDEN
	UN2984	**HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS** *with not less than 8%, but less than 20% hydrogen peroxide(stabilized as necessary)*	5.1	III		P5, A1	**A9.5.**
	UN2014	**HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS** *with not less than 20%, but not more than 40% hydrogen peroxide (stabilized as necessary)*	5.1	II	8	P5, A2, A3, A6	**A9.5.**
	UN2015	**HYDROGEN PEROXIDE, STABILIZED** *or* **HYDROGEN PEROXIDE AQUEOUS SOLUTIONS, STABILIZED** *with more than 60% hydrogen peroxide*	5.1		8		FORBIDDEN
	UN1966	**HYDROGEN, REFRIGERATED LIQUID***(cryogenic liquid)*	2.1			P3	**A6.11.**
	UN2202	**HYDROGEN SELENIDE, ANHYDROUS**	2.3		2.1		FORBIDDEN
	UN1053	**HYDROGEN SULPHIDE**	2.3		2.1	P2, 2, N89	**A6.4.**
	UN1740	**HYDROGENDIFLORIDES, N.O.S. SOLID** *or* **SOLUTION**	8	II III		P5, N3, N34 P5, N3, N34	**A12.2.**, **A12.3.** **A12.2.**, **A12.3.**
	UN2865	**HYDROXYLAMINE SULPHATE**	8	III		P5	**A12.3.**
		Hydroxyl amine iodide					FORBIDDEN
	UN1791	**HYPOCHLORITE SOLUTIONS**	8	II III		P5, A7, N34 P5, N34	**A12.2.** **A12.2.**
		Hyponitrous acid					FORBIDDEN
	UN3212	**HYPOCHLORITES, INORGANIC, N.O.S.**	5.1	II		P5	**A9.6.**
		Igniter fuse, metal clad; see **FUSE, IGNITER**, *tubular, metal clad*					
	UN0121	**IGNITERS**	1.1G			P4	**A5.26.**
	UN0314	**IGNITERS**	1.2G			P4	**A5.26.**
	UN0315	**IGNITERS**	1.3G			P5	**A5.26.**
	UN0325	**IGNITERS**	1.4G			P5	**A5.26.**
	UN0454	**IGNITERS**	1.4S			P5, A69	**A5.26.**
		Ignition element for lighter, containing pyrophoric liquid					FORBIDDEN
	UN2269	**3,3'-IMINODIPROPYLAMINE**	8	III		P5	**A12.2.**
*	UN2900	**INFECTIOUS SUBSTANCES, AFFECTING ANIMALS** *only(liquid) or (solid)*	6.2			P3	**A10.8.**
*	UN2814	**INFECTIOUS SUBSTANCES, AFFECTING HUMANS** *(liquid) or (solid)*	6.2			P1, A502	**A10.8.**
		Infectious Substances, Affecting Humans, Category B, see **BIOLOGICAL SUBSTANCES, CATEGORY B**					
		Initiating explosives (dry)					FORBIDDEN
		Inositol hexanitrate (dry)					FORBIDDEN

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*	UN3354	**INSECTICIDE GASES**, **FLAMMABLE, N.O.S**	2.1			P4	**A6.3.**, **A6.5.**
*	UN1968	**INSECTICIDE GASES**, **N.O.S**, *(aerosols in boxes) or (cylinders)*	2.2			P5	**A6.3.**, **A6.5.**
	UN1967	**INSECTICIDE GAS, TOXIC, N.O.S.**	2.3				FORBIDDEN
	UN3355	**INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.**	2.3		2.1		FORBIDDEN
		Inulin trinate (dry)					FORBIDDEN
		Iodine azidE (dry)					FORBIDDEN
*	UN3355	**INSECTICIDE GASES**, **TOXIC, FLAMMABLE, N.O.S** *Inhalation hazard Zone A*	2.3		2.1		FORBIDDEN
*	UN3355	**INSECTICIDE GASES**, **TOXIC, FLAMMABLE, N.O.S** *Inhalation hazard Zone B*	2.3		2.1		FORBIDDEN
*	UN3355	**INSECTICIDE GASES**, **TOXIC, FLAMMABLE, N.O.S** *Inhalation hazard Zone C*	2.3		2.1		FORBIDDEN
*	UN3355	**INSECTICIDE GASES**, **TOXIC, FLAMMABLE, N.O.S** *Inhalation hazard Zone D*	2.3		2.1		FORBIDDEN
	UN1792	**IODINE MONOCHLORIDE**	8	II		P4, N41	**A12.2.**
	UN2495	**IODINE PENTAFLUORIDE**	5.1	I	6.1, 8	P3	**A9.7.**
	UN2390	**2-IODOBUTANE**	3	II		P5	**A7.2.**
	UN2391	**IODOMETHYLPROPANES**	3	II		P5	**A7.2.**
	UN2392	**IODOPROPANES**	3	III		P5	**A7.2.**
		Iodoxy compounds (dry)					FORBIDDEN
		Iridium nitratopentamine iridium nitrate					FORBIDDEN
		Iron chloride; see **FERRIC CHLORIDE**					
	UN1376	**IRON OXIDE, SPENT**, *or* **IRON SPONGE, SPENT** *obtained from coal gas purification*	4.2	III			FORBIDDEN
	UN1994	**IRON PENTACARBONYL**	6.1	I	3	P1, 1	**A10.2.**
		Irritating agents; see **TEAR GAS SUBSTANCE LIQUID *or* TEAR GAS SUBSTANCE, SOLID, N.O.S.**					
	UN1969	**ISOBUTANE** *see also* **PETROLEUM GASES, LIQUEFIED**	2.1			P4, 19	**A6.3.**, **A6.4.**
	UN1212	**ISOBUTANOL** *or* **ISOBUTYL ALCOHOL**	3	III		P5	**A7.2.**
	UN1213	**ISOBUTYL ACETATE**	3	II		P5	**A7.2.**
	UN2527	**ISOBUTYL ACRYLATE, STABILIZED**	3	III		P5	**A7.2.**
		Isobutyl Alcohol; see **ISOBUTANOL**					
		Isobutyl Aldehyde; see **ISOBUTYRALDEHYDE**					
	UN1214	**ISOBUTYLAMINE**	3	II	8	P5	**A7.2.**
D	NA2742	**ISOBUTYL CHLOROFORMATE**	6.1	I	3, 8	P2, 2	**A10.6.**
	UN1055	**ISOBUTYLENE,** *see* **PETROLEUM GASES, LIQUEFIED**	2.1			P4	**A6.3.**, **A6.4.**
	UN2393	**ISOBUTYL FORMATE**	3	II		P5	**A7.2.**
	UN2528	**ISOBUTYL ISOBUTYRATE**	3	III		P5	**A7.2.**
+	UN2486	**ISOBUTYL ISOCYANATE**	3	I	6.1	P1, 1	**A7.5.**
	UN2283	**ISOBUTYL METHACRYLATE, STABILIZED**	3	III		P5	**A7.2.**
	UN2394	**ISOBUTYL PROPIONATE**	3	III		P5	**A7.2.**

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	UN2045	**ISOBUTYRALDEHYDE** *or* **ISOBUTYL ALDEHYDE**	3	II		P5	**A7.2.**
	UN2529	**ISOBUTYRIC ACID**	3	III	8	P5	**A7.2.**
	UN2530	**ISOBUTYRIC ANHYDRIDE**	3	III	8	P5	**A7.2.**
	UN2284	**ISOBUTYRONITRILE**	3	II	6.1	P5	**A7.2.**
	UN2395	**ISOBUTYRYL CHLORIDE**	3	II	8	P5	**A7.2.**
*	UN2206	**ISOCYANATES, TOXIC N.O.S**. *or* **ISOCYANATE SOLUTIONS, TOXIC N.O.S.,** *flashpoint more than 61 degrees C and boiling point less than 300 degrees C*	6.1	II III		P4 P4	**A10.4.** **A10.4.**
*	UN3080	**ISOCYANATES, TOXIC, FLAMMABLE N.O.S.** *or* **ISOCYANATE SOLUTIONS, TOXIC, FLAMMABLE, N.O.S.,** *flashpoint not less than 23 degrees C but not more than 61 degrees C and boiling point less than 300 degrees C*	6.1	II	3	P4	**A10.4.**
*	UN2478	**ISOCYANATES, FLAMMABLE, TOXIC, N.O.S**. *or* **ISOCYANATE SOLUTIONS, FLAMMABLE, TOXIC, N.O.S.,** *flashpoint less than 23 degrees C*	3	II	6.1	P2, 5, A3, A7	**A7.2.**
	UN2285	**ISOCYANATOBENZOTRIFLUORIDES**	6.1	II	3	P2, 5	**A10.4.**
	UN2287	**ISOHEPTENE**	3	II		P5	**A7.2.**
	UN2288	**ISOHEXENE**	3	II		P5	**A7.2.**
		Isooctane, see **OCTANES**					
	UN1216	**ISOOCTENE**	3	II		P5	**A7.2.**
		ISOPENTANE, *see* **PENTANE**					
	UN2371	**ISOPENTENES**	3	I		P3	**A7.2.**
		Isopentyl nitrite, see **AMYL NITRITE**					
	UN2289	**ISOPHORONEDIAMINE**	8	III		P5	**A12.2.**
	UN2290	**ISOPHORONE DIISOCYANATE**	6.1	III		P5	**A10.4.**
	UN1218	**ISOPRENE, STABILIZED**	3	I		P3	**A7.2.**
	UN1219	**ISOPROPANOL** *or* **ISOPROPYL ALCOHOL**	3	II		P5	**A7.2.**
	UN2403	**ISOPROPENYL ACETATE**	3	II		P5	**A7.2.**
	UN2303	**ISOPROPENYLBENZENE**	3	III		P5	**A7.2.**
	UN1220	**ISOPROPYL ACETATE**	3	II		P5	**A7.2.**
	UN1793	**ISOPROPYL ACID PHOSPHATE**	8	III		P5	**A12.3.**
		Isopropyl Alcohol, see **ISOPROPANOL**					
	UN1221	**ISOPROPYLAMINE**	3	I	8	P3	**A7.2.**
	UN1918	**ISOPROPYLBENZENE**	3	III		P5	**A7.2.**
		Isopropyl sec-butyl peroxydicarbonate, not more than 52%, with di-sec-butyl peroxydicarbonate, not more than 22%					FORBIDDEN
	UN2405	**ISOPROPYL BUTYRATE**	3	III		P5	**A7.2.**
	UN2947	**ISOPROPYL CHLOROACETATE**	3	III		P5	**A7.2.**
	UN2407	**ISOPROPYL CHLOROFORMATE**	6.1	I	3, 8	P2, 2	**A10.6.**
	UN2934	**ISOPROPYL 2-CHLOROPROPIONATE**	3	III		P5	**A7.2.**
		Isopropylcumyl hydroperxide, more than 72% in solution					FORBIDDEN

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		Isopropyl-alpha-chloropropionate, see **ISOPROPYL 2- CHLOROPROPIONATE**					
	UN2406	**ISOPROPYL ISOBUTYRATE**	3	II		P5	**A7.2.**
+	UN2483	**ISOPROPYL ISOCYANATE**	3	I	6.1	P1, 1	**A7.5.**
		Isopropyl mercaptan, see **PROPANETHIOLS**					
	UN1222	**ISOPROPYL NITRATE**	3	II		P5	**A7.2.**
		Isopropyl phosphoric acid, see **ISOPROPYL ACID PHOSPHATE**					
	UN2409	**ISOPROPYL PROPIONATE**	3	II		P5	**A7.2.**
	UN2907	**ISOSORBIDE DINITRATE MIXTURE** *with not less than 60% lactose, mannose, starch or calcium hydrogen phosphate*	4.1	II		P5	**A8.3.**
		Isosorbide dinitrate mixture with less than 60% lactose, mannose, starch or calcium hydrogen phosphate					FORBIDDEN
	UN3251	**ISOSORBIDE-5-MONONITRATE**	4.1	III		P5	**A8.3.**
		Isothiocyanic acid					FORBIDDEN
		Jet fuel, see **FUEL, AVIATION, TURBINE ENGINE**					
D	NA0124	**JET PERFORATING GUNS, CHARGED** *oil well, with detonator*	1.1D	II			FORBIDDEN
D	NA0494	**JET PERFORATING GUNS, CHARGED** *oil well, with detonator*	1.4D			P5, 56, A69	**A5.4.**
	UN0124	**JET PERFORATING GUNS, CHARGED** *oil well, without detonator*	1.1D				FORBIDDEN
	UN0494	**JET PERFORATING GUNS, CHARGED** *oil well, without detonator*	1.4D			P5, 56, A69	**A5.4.**
		Jet perforators, see **CHARGES, SHAPED,**					
		Jet tappers, without detonator, see **CHARGES, SHAPED,**					
		Jet thrust igniters, for rocket motors or Jato, see **IGNITERS**					
		Jet thrust unit (Jato) see **ROCKET MOTORS**					
	UN1223	**KEROSENE**	3	III		P5	**A7.2.**
*	UN1224	**KETONES, LIQUID, N.O.S.**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
	UN1056	**KRYPTON, COMPRESSED**	2.2			P5	**A6.3., A6.5.**
	UN1970	**KRYPTON, REFRIGERATED LIQUID***(cryogenic liquid)*	2.2			P4	**A6.11.**
		Lacquer base or lacquer chips,nitrocellulose, dry, see **NITROCELLULOSE**, *etc*					
		Lacquerbase or lacquer chips, plastic, wet with alcohol or solvent, see **NITROCELLULOSE** *or* **PAINT**, *etc.*					
	UN1616	**LEAD ACETATE**	6.1	III		P5	**A10.5.**
	UN1617	**LEAD ARSENATES**	6.1	II		P5	**A10.5.**
	UN1618	**LEAD ARSENITES**	6.1	II		P5	**A10.5.**

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		Lead azide (dry)					FORBIDDEN
	UN0129	**LEAD AZIDE,** *wetted with not less than 20% water or mixture of alcohol and water, by mass*	1.1A			P3, 111, 117	**A5.5.**
		Lead azide, wetted, with less than 20% water or mixture of alcohol and water					FORBIDDEN
	UN2291	**LEAD COMPOUNDS, SOLUBLE, N.O.S.**	6.1	III		P5	**A10.5.**
	UN1620	**LEAD CYANIDE**	6.1	II		P5	**A10.5.**
	UN1872	**LEAD DIOXIDE**	5.1	III		P5, A1	**A9.6.**
	UN1469	**LEAD NITRATE**	5.1	II	6.1	P5	**A9.6.**
		Lead nitroresorcinate (dry)					FORBIDDEN
	UN1470	**LEAD PERCHLORATE SOLID**	5.1	II	6.1	P5	**A9.6.**
	UN3408	**LEAD PERCHLORATE SOLUTION**	5.1	II III	6.1	P5 P5	**A9.5.** **A9.5.**
		Lead peroxide; see **LEAD DIOXIDE**					
	UN2989	**LEAD PHOSPHITE, DIBASIC**	4.1	II III		P5 P5	**A8.3.** **A8.3.**
		Lead picrate (dry)					FORBIDDEN
		Lead styphnate (dry)					FORBIDDEN
	UN0130	**LEAD STYPHNATE, WETTED** *or* **LEAD TRINITRORESORCINATE, WETTED** *with not less than 20% water or mixture of alcohol and water, by mass*	1.1A			P3, 111, 117	**A5.5.**
		Lead styphnate, wetted with less than 20% water or mixture of alcohol and water					FORBIDDEN
	UN1794	**LEAD SULPHATE** *with more than 3% free acid*	8	II		P5	**A12.3.**
		LEAD TRINITRORESORCINATE; *see* **LEAD STYPHNATE**, *etc.*					
		Lead trinitroresorcinate					FORBIDDEN
	UN3072	**LIFE-SAVING APPLIANCES, NOT SELF INFLATING** *containing dangerous goods as equipment*	9			P5	**A13.12.**
	UN2990	**LIFE-SAVING APPLIANCES, SELF INFLATING**	9			P5	**A13.12.**
		Lighters (cigarettes), with lighter fluids					FORBIDDEN
		Lighters (cigarettes), containing pyrophoric liquid					FORBIDDEN
	UN0131	**LIGHTERS, FUSE**	1.4S			P5, A69	**A5.28.**
	UN1057	**LIGHTERS *containing flammable gas***	2.1			P5, N10	**A6.10.**
	UN1057	**LIGHTER REFILLS *containing flammable gas no more than 4 fluid ounces (7.22 cubic inches) and 65 grams of flammable gas***	2.1			P5, N10	**A6.10.**
	UN1058	**LIQUEFIED GASES**, *nonflammable charged with nitrogen, carbon dioxide or air*	2.2			P5	**A6.3.**, **A6.4.**
*	UN3163	**LIQUEFIED GAS, N.O.S**	2.2			P5	**A6.3.**, **A6.4.**
*	UN3157	**LIQUEFIED GAS OXIDIZING, N.O.S**	2.2		5.1	P5	**A6.3.**, **A6.4.**
*	UN3160	**LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S,** *Inhalation Hazard Zone A*	2.3		2.1	P1, 1	**A6.15.**

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*	UN3160	**LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S,** *Inhalation Hazard Zone B*	2.3		2.1	P2, 2	**A6.4.**
*	UN3160	**LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S,** *Inhalation Hazard Zone C*	2.3		2.1	P2, 3	**A6.4.**
*	UN3160	**LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S,** *Inhalation Hazard Zone D*	2.3		2.1	P2, 4	**A6.4.**
*	UN3162	**LIQUEFIED GAS, TOXIC, N.O.S,** *Inhalation Hazard Zone A*	2.3			P1, 1	**A6.15.**
*	UN3162	**LIQUEFIED GAS, TOXIC, N.O.S,** *Inhalation Hazard Zone B*	2.3			P2, 2	**A6.4.**
*	UN3162	**LIQUEFIED GAS, TOXIC, N.O.S,** *Inhalation Hazard Zone C*	2.3			P2, 3	**A6.4.**
*	UN3162	**LIQUEFIED GAS, TOXIC, N.O.S,** *Inhalation Hazard Zone D*	2.3			P2, 4	**A6.4.**
*	UN3161	**LIQUEFIED GASES, FLAMMABLE, N.O.S.**	2.1			P4	**A6.3.**, **A6.4.**
*	UN3308	**LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S,** *Inhalation Hazard Zone A*	2.3		8	P1, 1	**A6.15.**
*	UN3308	**LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S,** *Inhalation Hazard Zone B*	2.3		8	P2, 2	**A6.4.**
*	UN3308	**LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S,** *Inhalation Hazard Zone C*	2.3		8	P2, 3	**A6.4.**
*	UN3308	**LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S,** *Inhalation Hazard Zone D*	2.3		8	P2, 4	**A6.4.**
*	UN3309	**LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S,** *Inhalation Hazard Zone A*	2.3		2.1, 8	P1, 1	**A6.15.**
*	UN3309	**LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S,** *Inhalation Hazard Zone B*	2.3		2.1, 8	P2, 2	**A6.4.**
*	UN3309	**LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S,** *Inhalation Hazard Zone C*	2.3		2.1, 8	P2, 3	**A6.4.**
*	UN3309	**LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S,** *Inhalation Hazard Zone D*	2.3		2.1, 8	P2, 4	**A6.4.**
*	UN3310	**LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S,** *Inhalation Hazard Zone A*	2.3		5.1, 8	P1, 1	**A6.15.**
*	UN3310	**LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S,** *Inhalation Hazard Zone B*	2.3		2.1, 8	P2, 2	**A6.4.**
*	UN3310	**LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S,** *Inhalation Hazard Zone C*	2.3		2.1, 8	P2, 3	**A6.4.**
*	UN3310	**LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S,** *Inhalation Hazard Zone D*	2.3		2.1, 8	P2, 4	**A6.4.**
*	UN3307	**LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S,** *Inhalation Hazard Zone A*	2.3		5.1	P1, 1	**A6.15.**
*	UN3307	**LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S,** *Inhalation Hazard Zone B*	2.3		5.1	P2, 2	**A6.4.**
*	UN3307	**LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S,** *Inhalation Hazard Zone C*	2.3		5.1	P2, 3	**A6.4.**
*	UN3307	**LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S,** *Inhalation Hazard Zone D*	2.3		5.1	P2, 4	**A6.4.**
		Liquefied natural gas; see **METHANE** *etc.*					
		Liquefied petroleum gas; see **PETROLEUM GASES, LIQUEFIED**					

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	UN1415	**LITHIUM**	4.3	I		P3, A7, A19, N45	**A8.3.**
	UN2445	**LITHIUM ALKYLS, LIQUID**	4.2	I	4.3	P3	**A8.5.**
	UN3433	**LITHIUM ALKYLS, SOLID**	4.2				FORBIDDEN
	UN1410	**LITHIUM ALUMINIUM HYDRIDE**	4.3	I		P3, A19	**A8.3.**
	UN1411	**LITHIUM ALUMINIUM HYDRIDE, ETHEREAL**	4.3	I	3	P3, A2, A3, A11, N34	**A8.2.**
	UN3091	**LITHIUM BATTERIES CONTAINED IN EQUIPMENT**	9	II		P5	**A13.8.**
	UN3091	**LITHIUM BATTERIES PACKED WITH EQUIPMENT**	9	II		P5	**A13.9.**
	UN3090	**LITHIUM BATTERIES**	9	II		P5	**A13.7.**
	UN1413	**LITHIUM BOROHYDRIDE**	4.3	I		P3, A19, N40	**A8.3.**
	UN2830	**LITHIUM FERROSILICON**	4.3	II		P5, A19	**A8.3.**
	UN1414	**LITHIUM HYDRIDE**	4.3	I		P3, A19, N40	**A8.3.**
	UN2805	**LITHIUM HYDRIDE, FUSED SOLID**	4.3	II		P5, A8, A19, A20	**A8.3.**
	UN2680	**LITHIUM HYDROXIDE, MONOHYDRATE** *or* **LITHIUM HYDROXIDES, SOLID**	8	II		P5	**A12.3.**
	UN2679	**LITHIUM HYDROXIDE, SOLUTION**	8	II III		P5 P5	**A12.2.** **A12.2.**
	UN1471	**LITHIUM HYPOCHLORITE, DRY** *or* **LITHIUM HYPOCHLORITE MIXTURES,**	5.1	II		P5, A9, N34	**A9.6.**
	UN2722	**LITHIUM NITRATE**	5.1	III		P5, A1	**A9.6.**
	UN2806	**LITHIUM NITRIDE**	4.3	I		P3, A19, N40	**A8.3.**
	UN1472	**LITHIUM PEROXIDE**	5.1	II		P5, A9, N34	**A9.6.**
	UN1417	**LITHIUM SILICON**	4.3	II		P5, A19, A20	**A8.3.**
	UN1621	**LONDON PURPLE**	6.1	II		P5	**A10.5.**
		LPG, see **PETROLEUM GASES, LIQUEFIED**					
		Lye solution, see **SODIUM HYDROXIDE, SOLUTIONS**					
	UN3053	**MAGNESIUM ALKYLS**	4.2	I	4.3	P3	**A8.5.**
	UN1419	**MAGNESIUM ALUMINIUM PHOSPHIDE**	4.3	I	6.1	P3, A19, N34, N40	**A8.3.**
+	UN1622	**MAGNESIUM ARSENATE**	6.1	II		P5	**A10.5.**
		Magnesium bisulfite solution, see **BISULFITES AQUEOUS SOLUTIONS, N.O.S.**					
	UN1473	**MAGNESIUM BROMATE**	5.1	II		P5, A1	**A9.6.**
	UN2723	**MAGNESIUM CHLORATE**	5.1	II		P5	**A9.6.**
	UN2004	**MAGNESIUM DIAMIDE**	4.2	II		P5, A8, A19, A20	**A8.3.**
	UN2005	**MAGNESIUM DIPHENYL**	4.2	I		P3	**A8.11.**
		Magnesium dross, wet or hot					FORBIDDEN
	UN2853	**MAGNESIUM FLUOROSILICATE**	6.1	III		P5	**A10.5.**
	UN2950	**MAGNESIUM GRANULES, COATED**, *particle size not less than 149 Microns*	4.3	III		P5, A1, A19	**A8.3.**
	UN2010	**MAGNESIUM HYDRIDE**	4.3	I		P3, A19, N40	**A8.3.**

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	UN1869	**MAGNESIUM** *or* **MAGNESIUM ALLOYS** *with more than 50% magnesium in pellets, turnings or ribbons*	4.1	III		P5, A1	**A8.3.**
	UN1474	**MAGNESIUM NITRATE**	5.1	III		P5, A1	**A9.6.**
	UN1475	**MAGNESIUM PERCHLORATE**	5.1	II		P5	**A9.6.**
	UN1476	**MAGNESIUM PEROXIDE**	5.1	II		P5	**A9.6.**
	UN2011	**MAGNESIUM PHOSPHIDE**	4.3	I	6.1	P3, A19, N40	**A8.3.**
	UN1418	**MAGNESIUM, POWDER** *or* **MAGNESIUM ALLOYS**, **POWDER**	4.3	I II III	4.2 4.2 4.2	P3, A19 P5, A19 P5, A19	**A8.3.** **A8.3.** **A8.3.**
		Magnesium scrap, see **MAGNESIUM,** *etc.*					
	UN2624	**MAGNESIUM SILICIDE**	4.3	II		P5, A19, A20	**A8.3.**
	UN2807	**MAGNETIZED MATERIAL**	9			P5	**A13.11.**
	UN2215	**MALEIC ANHYDRIDE**	8	III		P5	**A12.3.**
	UN2215	**MALEIC ANHYDRIDE**, MOLTEN	8				FORBIDDEN
	UN2647	**MALONONITRILE**	6.1	II		P5	**A10.5.**
		Mancozeb (manganese, ethylenebisdithiocarbamate complex with zinc) see **MANEB**					
	UN2210	**MANEB** *or* **MANEB PREPARATIONS** *with not less than 60% maneb*	4.2	III	4.3	P5, A1, A19	**A8.3.**
	UN2968	**MANEB STABILIZED** *or* **MANEB PREPARATIONS**, **STABILIZED** *against self-heating*	4.3	III		P5, A1, A19	**A8.3.**
	UN2724	**MANGANESE NITRATE**	5.1	III		P5, A1	**A9.6.**
	UN1330	**MANGANESE RESINATE**	4.1	III		P5, A1	**A8.3.**
		Mannitan tetranitrate					FORBIDDEN
		Mannitol hexanitrate (dry)					FORBIDDEN
	UN0133	**MANNITOL HEXANITRATE, WETTED** *or* **NITROMANNITE, WETTED** *with not less than 40% water, or mixture of alcohol and water, by mass*	1.1D			P4	**A5.7.**
		Mannitol hexanitrate, wetted with less than 40% water or mixture of alcohol and water					FORBIDDEN
		Matches, block, see **MATCHES, STRIKE ANYWHERE**					
	UN2254	**MATCHES, FUSEE**	4.1	III		P4	**A8.14.**
	UN1944	**MATCHES, SAFETY***(book, card or strike on box)*	4.1	III		P5	**A8.14.**
	UN1331	**MATCHES, STRIKE ANYWHERE**	4.1	III		P4	**A8.14.**
	UN1945	**MATCHES, WAX, VESTA**	4.1	III		P5	**A8.14.**
	UN3291	**MEDICAL WASTE, N.O.S.**	6.2	II		P5, A117	**A10.10.**
		Matting Acid, see **SULPHURIC ACID**					
	UN3248	**MEDICINE, LIQUID, FLAMMABLE**, **TOXIC, N.O.S**.	3	II III	6.1 6.1	P4, 36 P5, 36	**A7.2.** **A7.2.**
	UN1851	**MEDICINE, LIQUID TOXIC, N.O.S.**	6.1	II III		P5 P5	**A10.4.** **A10.4.**
	UN3249	**MEDICINE, SOLID, TOXIC, N.O.S.**	6.1	II III		P5, 36 P5, 36	**A10.5.** **A10.5.**

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*	UN3336	**MERCAPTANS, LIQUID, FLAMMABLE, N.O.S.** *or* **MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.**	3	I		P3	**A7.2.**
				II		P5	**A7.2.**
				III		P5	**A7.2.**
*	UN1228	**MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S.** *or* **MERCAPTAN MIXTURES, LIQUID, FLAMMABLE, TOXIC, N.O.S.**	3	II	6.1	P4	**A7.2.**
				III	6.1	P5	**A7.2.**
*	UN3071	**MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S**. *or* **MERCAPTAN MIXTURES, LIQUID, TOXIC, FLAMMABLE, N.O.S.,** *flashpoint not less than 23 degrees C*	6.1	II	3	P5	**A10.4.**
	UN0448	**5-MERCAPTOTETRAZOL-1-ACETIC ACID**	1.4C			P5	**A5.10.**
	UN1623	**MERCURIC ARSENATE**	6.1	II		P5	**A10.5.**
	UN1624	**MERCURIC CHLORIDE**	6.1	II		P5	**A10.5.**
	UN1625	**MERCURIC NITRATE**	6.1	II		P5, N73	**A10.5.**
+	UN1626	**MERCURIC POTASSIUM CYANIDE**	6.1	I		P5, N74, N75	**A10.5.**
		Mercuric sulfocyanate, see **MERCURY THIOCYANATE**					
		Mercurol, see **MERCURY NUCLEATE**					
		Mercurous azide					FORBIDDEN
	UN1627	**MERCUROUS NITRATE**	6.1	II		P5	**A10.5.**
	UN2809	**MERCURY**	8	III		P5	**A12.9.**
	UN1629	**MERCURY ACETATE**	6.1	II		P5	**A10.5.**
		Mercury acetylide					FORBIDDEN
	UN1630	**MERCURY AMMONIUM CHLORIDE**	6.1	II		P5	**A10.5.**
*	UN2778	**MERCURY BASED PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	I	6.1	P3	**A7.2.**
				II	6.1	P4	**A7.2.**
*	UN3011	**MERCURY BASED PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	I	3	P3	**A10.4.**
				II	3	P4	**A10.4.**
				III	3	P5	**A10.4.**
*	UN3012	**MERCURY BASED PESTICIDES, LIQUID, TOXIC**	6.1	I		P3	**A10.4.**
				II		P4	**A10.4.**
				III		P5	**A10.4.**
*	UN2777	**MERCURY BASED PESTICIDES, SOLID, TOXIC**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
	UN1631	**MERCURY BENZOATE**	6.1	II		P5	**A10.5.**
	UN1634	**MERCURY BROMIDES**	6.1	II		P5	**A10.5.**
	UN2024	**MERCURY COMPOUNDS, LIQUID, N.O.S.**	6.1	I		P3	**A10.4.**
				II		P4	**A10.4.**
				III		P5	**A10.4.**
	UN2025	**MERCURY COMPOUNDS, SOLID, N.O.S.**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**

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	UN2809	**MERCURY CONTAINED IN MANUFACTURED ARTICLES**	8	III		P5	**A12.9.**
	UN1636	**MERCURY CYANIDE**	6.1	II		P5, N74, N75	**A10.5.**
	UN0135	**MERCURY FULMINATE, WETTED** *with not less than 20% water, or mixture of alcohol and water, by mass*	1.1A			P3, 111, 117	**A5.5.**
		Mercury fulminate, wetted with less than 20% water or mixture of alcohol and water					FORBIDDEN
	UN1637	**MERCURY GLUCONATE**	6.1	II		P5	**A10.5.**
	UN1638	**MERCURY IODIDE**, *solid or solution*	6.1	II		P5	**A10.4., A10.5.**
		Mercury iodine aquabasic ammonobasic (Iodide of Millon's base)					FORBIDDEN
		Mercury Nitride					FORBIDDEN
	UN1639	**MERCURY NUCLEATE**	6.1	II		P5	**A10.5.**
	UN1640	**MERCURY OLEATE**	6.1	II		P5	**A10.5.**
	UN1641	**MERCURY OXIDE**	6.1	II		P5	**A10.5.**
		Mercury oxycyanide, not desensitized					FORBIDDEN
	UN1642	**MERCURY OXYCYANIDE, DESENSITIZED**	6.1	II		P5	**A10.5.**
	UN1643	**MERCURY POTASSIUM IODIDE**	6.1	II		P5	**A10.5.**
	UN1644	**MERCURY SALICYLATE**	6.1	II		P5	**A10.5.**
+	UN1645	**MERCURY SULPHATES**	6.1	II		P5	**A10.5.**
	UN1646	**MERCURY THIOCYANATE**	6.1	II		P5	**A10.5.**
	UN1229	**MESITYL OXIDE**	3	III		P5	**A7.2.**
*	UN3281	**METAL CARBONYLS, LIQUID, N.O.S.**	6.1	I II III		P3, 5 P4 P5	**A10.4.** **A10.4.** **A10.4.**
	UN3466	**METAL CARBONYLS, SOLID, N.O.S.**	6.1	I II III		P3, 5 P4 P5	**A10.5.** **A10.5.** **A10.5.**
	UN2881	**METAL CATALYST, DRY**	4.2	I II III		P3, N34 P5, N34 P5, N34	**A8.11.** **A8.11.** **A8.11.**
	UN1378	**METAL CATALYST, WETTED** *with a visible excess of liquid*	4.2	II		P5, A2, A8, N34	**A8.3.**
		Metal catalyst, wetted without a visible excess of liquid					FORBIDDEN
	UN1332	**METALDEHYDE**	4.1	III		P5, A1	**A8.3.**
*	UN3182	**METAL HYDRIDES, FLAMMABLE, N.O.S.**	4.1	II III		P5, A1 P5, A1	**A8.3.** **A8.3.**
*	UN1409	**METAL HYDRIDES, WATER-REACTIVE, N.O.S.**	4.3	I II		P3, A19, N34, N40 P5, A19, N34, N40	**A8.3.** **A8.3.**
	UN3089	**METAL POWDER, FLAMMABLE, N.O.S.**	4.1	II III		P5 P5	**A8.3.** **A8.3.**

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*	UN3189	**METAL POWDER, SELF-HEATING, N.O.S.**	4.2	II		P5	**A8.3.**
				III		P5	**A8.3.**
		Metal salts of methyl nitramine (dry)					FORBIDDEN
*	UN3181	**METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.**	4.1	II		P4, A1	**A8.3.**
				III		P4, A1	**A8.3.**
*	UN3208	**METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.**	4.3	I		P3	**A8.3.**
				II		P5	**A8.3.**
				III		P5	**A8.3.**
*	UN3209	**METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.**	4.3	I	4.2	P3	**A8.3.**
				II	4.2	P4	**A8.3.**
				III	4.2	P5	**A8.3.**
	UN2396	**METHACRYLALDEHYDE, STABILIZED**	3	II	6.1	P5	**A7.2.**
	UN2531	**METHACRYLIC ACID, STABILIZED**	8	III		P5	**A12.2.**
		Methacrylic acid, unstabilized					FORBIDDEN
+	UN3079	**METHACRYLONITRILE, STABILIZED**	3	I	6.1	P2, 2	**A7.5.**
	UN2614	**METHALLYL ALCOHOL**	3	III		P5	**A7.2.**
	UN1971	**METHANE, COMPRESSED** *or* **NATURAL GAS, COMPRESSED** *(with high methane content)*	2.1			P4	**A6.3.**, **A6.5.**
	UN1972	**METHANE, REFRIGERATED LIQUID***(cryogenic liquid) or* **NATURAL GAS, REFRIGERATED LIQUID** *(cryogenic liquid, with high methane content)*	2.1			P3	**A6.11.**
	UN3246	**METHANESULPHONYL CHLORIDE**	6.1	I	8	P2, 2	**A10.6.**
+	UN1230	**METHANOL**	3	II	6.1	P4	**A7.2.**
D	UN1230	**METHANOL**	3	II		P4	**A7.2.**
		Methazoic acid					FORBIDDEN
+	UN2605	**METHOXYMETHYL ISOCYANATE**	3	I	6.1	P1, 1	**A7.5.**
	UN2293	**4-METHOXY-4-METHYLPENTAN-2-ONE**	3	III		P5	**A7.2.**
	UN3092	**1-METHOXY-2-PROPANOL**	3	III		P5	**A7.2.**
	UN1231	**METHYL ACETATE**	3	II		P5	**A7.2.**
		Methylacetylene and propadiene mixture, non-stabilized					FORBIDDEN
	UN1060	**METHYL ACETYLENE AND PROPADIENE MIXTURES, STABILIZED**	2.1			P4, N88	**A6.3.**, **A6.4.**
	UN1919	**METHYL ACRYLATE, STABILIZED**	3	II		P5	**A7.2.**
		Methyl acrylate, unstabilized					FORBIDDEN
	UN1234	**METHYLAL**	3	II		P5	**A7.2.**
		Methyl Alcohol, see **METHANOL**					
	UN2554	**METHYL ALLYL CHLORIDE**	3	II		P5	**A7.2.**
	UN1061	**METHYLAMINE, ANHYDROUS**	2.1			P4, N87	**A6.3.**, **A6.4.**
	UN1235	**METHYLAMINE, AQUEOUS SOLUTION**	3	II	8	P4	**A7.2.**
		Methylamine dinitramine and dry salts thereof					FORBIDDEN
		Methylamine nitroform					FORBIDDEN
		Methylamine perchlorate (dry)					FORBIDDEN

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	UN1233	**METHYLAMYL ACETATE**	3	III		P5	**A7.2.**
		Methyl amyl ketone, see **AMYL METHYL KETONE**					
	UN2294	**N-METHYLANILINE**	6.1	III		P5	**A10.4.**
	UN2938	**METHYL BENZOATE**	6.1	III		P5	**A10.4.**
	UN2937	**ALPHA-METHYLBENZYL ALCOHOL, LIQUID**	6.1	III		P5	**A10.4.**
	UN3438	**ALPHA-METHYLBENZYL ALCOHOL, SOLID**	6.1	III		P5	**A10.5.**
	UN1062	**METHYL BROMIDE**	2.3			P2, 3, N86	**A6.16.**
		Methyl bromide and chloropicrin mixtures see **CHLOROPICRIN AND METHYL BROMIDE MIXTURES**					
	UN1647	**METHYL BROMIDE AND ETHYLENE DIBROMIDE MIXTURES, LIQUID**	6.1	I		P2, 2, N65	**A10.6.**
	UN2643	**METHYL BROMOACETATE**	6.1	II		P5	**A10.4.**
	UN2397	**3-METHYLBUTAN-2-ONE**	3	II		P5	**A7.2.**
	UN3371	**2-METHYLBUTANAL**	3	II		P5	**A7.2.**
	UN2561	**3-METHYL-1-BUTENE**	3	I		P3	**A7.2.**
	UN2459	**2-METHYL-1-BUTENE**	3	I		P3	**A7.2.**
	UN2460	**2-METHYL-2-BUTENE**	3	II		P5	**A7.2.**
	UN2945	**N-METHYLBUTYLAMINE**	3	II	8	P4	**A7.2.**
	UN2398	**METHYL-TERT-BUTYL ETHER**	3	II		P5	**A7.2.**
	UN1237	**METHYL BUTYRATE**	3	II		P5	**A7.2.**
	UN1063	**METHYL CHLORIDE** *or* **REFRIGERANT GAS R40**	2.1			P4, N86	**A6.3.**, **A6.4.**
		Methyl chloride and chloropicrin mixtures, see **CHLOROPICRIN and METHYL CHLORIDE**					
	UN1912	**METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE**	2.1			P4, N86	**A6.3.**, **A6.4.**
	UN2295	**METHYL CHLOROACETATE**	6.1	I	3	P5	**A10.4.**
		Methyl chlorocarbonate, see **METHYL CHLOROFORMATE**					
	UN1238	**METHYL CHLOROFORMATE**	6.1	I	3, 8	P1, 1, N34	**A10.6.**
		Methyl chloroform, see **1,1,1-TRICHLOROETHANE**					
	UN1239	**METHYL CHLOROMETHYL ETHER**	6.1	I	3	P1, 1	**A10.6.**
	UN2933	**METHYL-2-CHLOROPROPIONATE**	3	III		P5	**A7.2.**
	UN2534	**METHYLCHLOROSILANE**	2.3		2.1, 8	P2, 2, A2, A3, A7, N34	**A6.19.**
	UN2296	**METHYLCYCLOHEXANE**	3	II		P5	**A7.2.**
	UN2617	**METHYLCYCLOHEXANOLS**, *flammable*	3	III		P5	**A7.2.**
	UN2297	**METHYLCYCLOHEXANONE**	3	III		P5	**A7.2.**
	UN2298	**METHYLCYCLOPENTANE**	3	II		P5	**A7.2.**
	UN2299	**METHYL DICHLOROACETATE**	6.1	III		P5	**A10.4.**
		Methyldichloroarsine					FORBIDDEN

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D	NA1556	**METHYLDICHLOROARSINE**	6.1	I		P2, 2	**A10.2.**
	UN1242	**METHYLDICHLOROSILANE**	4.3	I	3, 8	P3, A2, A3, A7, N34	**A8.2.**
		Methylene chloride, see **DICHLOROMETHANE**					
		Methylene glycol dinitrate					FORBIDDEN
		Methyl ethyl ether, *see* **ETHYL METHYL ETHER**					
	UN1193	**METHYL ETHYL KETONE**, *or* **ETHYL METHYL KETONE**	3	II		P5	**A7.2.**
		Methyl ethyl ketone peroxide, in solution with more than 9% by mass active oxygen					FORBIDDEN
		Methyl ethyl ketone peroxide(s) more than 50%					FORBIDDEN
		Methyl ethyl ketone peroxide(s), not more than 52% when with 48% or more diluent type A					FORBIDDEN
	UN2300	**2-METHYL-5-ETHYLPYRIDINE**	6.1	III		P5	**A10.4.**
	UN2454	**METHYL FLUORIDE** *or* **REFRIGERANT GAS R41**	2.1			P4	**A6.3.**, **A6.4.**
	UN1243	**METHYL FORMATE**	3	I		P3	**A7.2.**
	UN2301	**2-METHYLFURAN**	3	II		P5	**A7.2.**
		a-Methylglucoside Tetranitrate					FORBIDDEN
		a-Methylglycerol Trinitrate					FORBIDDEN
	UN2302	**5-METHYLHEXAN-2-ONE**	3	III		P5	**A7.2.**
	UN1244	**METHYLHYDRAZINE**	6.1	I	3, 8	P1, 1, N34	**A10.6.**
	UN3023	**2-METHYL-2-HEPTANETHIOL**	6.1	I	3	P2, 2	**A10.6.**
	UN2644	**METHYL IODIDE**	6.1	I		P2, 2	**A10.6.**
	UN2053	**METHYL ISOBUTYL CARBINOL**	3	III		P5	**A7.2.**
	UN1245	**METHYL ISOBUTYL KETONE**	3	II		P5	**A7.2.**
		Methyl isobutyl ketone peroxide, in solution with more than 9% by mass active oxygen					FORBIDDEN
	UN2480	**METHYL ISOCYANATE**	6.1	I	3	P1, 1	**A10.6.**
	UN1246	**METHYL ISOPROPENYL KETONE, STABILIZED**	3	II		P5	**A7.2.**
		Methyl isopropenyl ketone, unstabilized					FORBIDDEN
	UN2477	**METHYL ISOTHIOCYANATE**	6.1	I	3	P2, 2	**A10.6.**
	UN2400	**METHYL ISOVALERATE**	3	II		P5	**A7.2.**
	UN1928	**METHYL MAGNESIUM BROMIDE IN ETHYL ETHER**	4.3	I	3	P3	**A8.2.**
	UN1064	**METHYL MERCAPTAN**	2.3		2.1	P2, 3, N89	**A6.4.**
	UN1247	**METHYL METHACRYLATE MONOMER**, **STABILIZED**	3	II		P5	**A7.2.**
		Methyl norbornene dicarboxylic anhydride, see **CORROSIVE LIQUID N.O.S.**					
		Methyl methacrylate monomer, unstabilized					FORBIDDEN
	UN2535	**4-METHYLMORPHOLINE** or **N-METHYLMORPHOLINE**	3	II	8	P5	**A7.2.**
		Methyl nitramine (dry), metal salts of					FORBIDDEN
		Methyl nitrate					FORBIDDEN
		Methyl nitrite					FORBIDDEN

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	UN2606	**METHYL ORTHOSILICATE**	6.1	I	3	P2, 2	**A10.6.**
	UN2461	**METHYLPENTADIENE**	3	II		P5	**A7.2.**
	UN2560	**2-METHYLPENTAN-2-OL**	3	III		P5	**A7.2.**
	UN2437	**METHYLPHENYLDICHLOROSILANE**	8	II		P5	**A12.2.**
		Methyl picric acid (heavy metal salts of)					FORBIDDEN
D	NA9206	**METHYL PHOSPHONIC DICHLORIDE**	6.1	I	8	P2, 2, A3 N34, N43	**A10.6.**
		Methyl phosphonothioic dichloride, anhydrous, see **CORROSIVE LIQUID, N.O.S**					
D	NA2845	**METHYL PHOSPHONOUS DICHLORIDE,** *pyrophoric liquid*	6.1	I	4.2	P2, 2	**A10.6.**
	UN2399	**1-METHYLPIPERIDINE**	3	II	8	P4	**A7.2.**
	UN1248	**METHYL PROPIONATE**	3	II		P5	**A7.2.**
	UN2612	**METHYL PROPYL ETHER**	3	II		P5	**A7.2.**
	UN1249	**METHYL PROPYL KETONE**	3	II		P5	**A7.2.**
		Methyl sulfate, see **DIMETHYL SULFATE**					
		Methyl sulphide, see **DIMETHYL SULPHIDE**					
	UN2536	**METHYLTETRAHYDROFURAN**	3	II		P5	**A7.2.**
	UN2533	**METHYL TRICHLOROACETATE**	6.1	III		P5	**A10.4.**
	UN1250	**METHYLTRICHLOROSILANE**	3	I	8	P3, A7, N34	**A7.2.**
		Methyl trimethylol methane trinitrate					FORBIDDEN
	UN2367	**ALPHA-METHYLVALERALDEHYDE**	3	II		P5	**A7.2.**
		***Mine rescue equipment containing carbon dioxide, see* CARBON DIOXIDE**					
		***Mobility aids, see* BATTERY POWERED EQUIPMENT *or* BATTERY POWERED VEHICLE**					
	UN1251	**METHYL VINYL KETONE, STABILIZED**	6.1	I	3, 8	P1, 1	**A10.6.**
	UN0136	**MINES** *with bursting charge*	1.1F			P4	**A5.13.**
	UN0137	**MINES** *with bursting charge*	1.1D			P4	**A5.13.**
	UN0138	**MINES** *with bursting charge*	1.2D			P4	**A5.13.**
	UN0294	**MINES** *with bursting charge*	1.2F			P4	**A5.13.**
		Mixed acid, see* NITRATING ACID, MIXTURES, *etc					
D	NA0276	**MODEL ROCKET MOTOR**	1.4C	II		P4, 62	**A5.13.**
D	NA0323	**MODEL ROCKET MOTOR**	1.4S	II		P4, 62	**A5.13.**
	UN2508	**MOLYBDENUM PENTACHLORIDE**	8	III		P5	**A12.3.**
		Monochloroacetone (unstabilized)					FORBIDDEN
		Monochloroethylene, see **VINYL CHLORIDE, STABILIZED**					
		Monoethanolamine, see **ETHANOLAMINE, SOLUTIONS**					
		Monoethylamine, see **ETHYLAMINE**					
	UN2054	**MORPHOLINE**	8	I	3	P5	**A12.2.**
		Morpholine, aqueous, mixture, see **CORROSIVE LIQUID, N.O.S.**					

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	UN1649	**MOTOR FUEL ANTI-KNOCK MIXTURES**	6.1	I		P3	**A10.4.**
	UN1203	**MOTOR SPIRIT,***(see* **GASOLINE**)	3	II		P5	**A7.2.**
		Muriatic acid, see **HYDROCHLORIC ACID SOLUTION**					
	UN2956	**MUSK XYLENE**, (*see* **5-TERT-BUTYL-2,4,6-TRINITO-M-XYLENE)**	4.1	III		P5	**A8.4.**
		Naphtha, see **PETROLEUM DISTALLATE N.O.S**					
	UN1334	**NAPHTHALENE, CRUDE** *or* **REFINED**	4.1	III		P5, A1	**A8.3.**
		Naphthalene diozonide					FORBIDDEN
	UN2304	**NAPHTHALENE, MOLTEN**	4.1				FORBIDDEN
	UN2077	**ALPHA-NAPHTHYLAMINE**	6.1	III		P5	**A10.5.**
	UN1650	**BETA-NAPHTHYLAMINE, SOLID**	6.1	II		P5	**A10.5.**
		Naphthyl amineperchlorate					FORBIDDEN
	UN3411	**BETA- NAPHTHYLAMINE SOLUTION**	6.1	II III		P5 P5	**A10.4.** **A10.4.**
	UN1651	**NAPHTHYLTHIOUREA**	6.1	II		P5	**A10.5.**
	UN1652	**NAPHTHYLUREA**	6.1	II		P5	**A10.5.**
		Natural gases (with high methane content) see **METHANE, ETC**					
	UN1971	**NATURAL GAS, COMPRESSED**	2.1			P4	**A6.3.**, **A6.5.**
	UN1972	**NATURAL GAS, REFRIGERATED LIQUID**, *with high methane content (cryogenic liquid)*	2.1			P3	**A6.10.**
	UN1065	**NEON, COMPRESSED**	2.2			P5	**A6.3.**, **A6.5.**
		Neon, liquid, non-pressurized					FORBIDDEN
	UN1913	**NEON, REFRIGERATED LIQUID** *(cryogenic liquid)*	2.2			P4	**A6.11.**
	UN1259	**NICKEL CARBONYL**	6.1		3		FORBIDDEN
	UN1653	**NICKEL CYANIDE**	6.1	II		P5, N74, N75	**A10.5.**
	UN2725	**NICKEL NITRATE**	5.1	III		P5, A1	**A9.6.**
	UN2726	**NICKEL NITRITE**	5.1	III		P5, A1	**A9.6.**
		Nickel Picrate					FORBIDDEN
	UN1654	**NICOTINE**	6.1	II		P5	**A10.4.**
	UN3144	**NICOTINE COMPOUNDS, LIQUID, N.O.S**. *or* **NICOTINE PREPARATIONS, LIQUID, N.O.S.**	6.1	I II III		P3, A4 P5 P5	**A10.4.** **A10.4.** **A10.4.**
	UN1655	**NICOTINE COMPOUNDS, SOLID, N.O. S.** *or* **NICOTINE PREPARATIONS, SOLID, N.O.S.**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
	UN1656	**NICOTINE HYDROCHLORIDE LIQUID** *or* **NICOTINE HYDROCHLORIDE SOLUTION**	6.1	II		P5	**A10.4.**
	UN3444	**NICOTINE HYDROCHLORIDE, SOLID**	6.1	II		P5	**A10.6.**

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	UN3144	**NICOTINE PREPARATION, LIQUID, N.O.S.**	6.1	I II III		P3, A4 P5 P5	**A10.4.** **A10.4.** **A10.4.**
	UN1657	**NICOTINE SALICYLATE**	6.1	II		P5	**A10.5.**
	UN3445	**NICOTINE SULPHATE, SOLID**	6.1	II		P5	**A10.6.**
	UN1658	**NICOTINE SULPHATE, SOLUTION**	6.1	II		P5	**A10.4.**
	UN1659	**NICOTINE TARTRATE**	6.1	II		P5	**A10.5.**
		Nitrated Paper (unstable)					FORBIDDEN
	UN1477	**NITRATES, INORGANIC**, **N.O.S**.	5.1	II III		P5 P5	**A9.6.** **A9.6.**
	UN3218	**NITRATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.**	5.1	II III		P5 P5	**A9.5.** **A9.5.**
		Nitrates of diazonium compounds					FORBIDDEN
	UN1826	**NITRATING ACID MIXTURES, SPENT** *with not more than 50% nitric acid*	8	II		P4	**A12.10.**
	UN1826	**NITRATING ACID MIXTURES, SPENT** *with 50% or more nitric acid*	8	I	5.1	P3	**A12.10.**
		Nitrating acid mixture, spent, all concentrations, unstable					FORBIDDEN
	UN1796	**NITRATING ACID MIXTURES** *with* not *more than 50% nitric acid*	8	II		P4	**A12.10.**
	UN1796	**NITRATING ACID MIXTURES** with *50% or more nitric acid*	8	I	5.1	P3	**A12.10.**
	UN2031	**NITRIC ACID *other than red fuming, with not more than 20% nitric acid***	8	II		P4	**A12.11.**
	UN2031	**NITRIC ACID** *other than red fuming, with more than 70% nitric acid*	8	I	5.1	P3	**A12.10.**
	UN2031	**NITRIC ACID**, *other than red fuming, with not more than 70% nitric acid*	8	II		P4	**A12.10.**
+	UN2032	**NITRIC ACID, RED FUMING**	8	I	5.1, 6.1	P2, 2	**A12.11.**
	UN1975	**NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE *or* NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE**	2.3		5.1, 8		FORBIDDEN
	UN1660	**NITRIC OXIDE, COMPRESSED**	2.3		5.1, 8	P1, 1	**A6.19.**
*	UN3276	**NITRILES, TOXIC, LIQUID, N.O.S.**	6.1	I II III		P3, 5 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN3275	**NITRILES, TOXIC, FLAMMABLE, N.O.S.**	6.1	I II	3 3	P3, 5 P4	**A10.4.** **A10.4.**
*	UN3273	**NITRILES, FLAMMABLE, TOXIC, N.O.S.**	3	I II	6.1 6.1	P3 P4	**A7.2.** **A7.2.**
	UN3439	**NITRILES, TOXIC, SOLID, N.O.S.**	6.1	I II III		P3, 5 P4 P5	**A10.5.** **A10.5.** **A10.5.**
	UN2627	**NITRITES, INORGANIC, N.O.S.**	5.1	II		P5, 33	**A9.6.**

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	UN3219	**NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S.**	5.1	II III		P5 P5	**A9.5.** **A9.5.**
		N-Nitroaniline					FORBIDDEN
+	UN1661	**NITROANILINES** *(o-;m-;p-;)*	6.1	II		P5	**A10.5.**
+	UN2730	**NITROANISOLES, LIQUID**	6.1	III		P5	**A10.4.**
*	UN3458	**NITROANISOLES, SOLID**	6.1	III		P5	**A10.5.**
+	UN1662	**NITROBENZENE**	6.1	II		P5	**A10.4.**
		m-Nitrobenzene diazonium perchlorate					FORBIDDEN
	UN2305	**NITROBENZENESULPHONIC ACID**	8	II		P5	**A12.2.**
		Nitrobenzol, see **NITROBENZENE**					
	UN0385	**5-NITROBENZOTRIAZOL**	1.1D			P4	**A5.7.**
	UN2306	**NITROBENZOTRIFLUORIDES, LIQUID**	6.1	II		P5	**A10.4.**
	UN3431	**NITROBENZOTRIFLUORIDES, SOLID**	6.1	II		P5	**A10.5.**
	UN2732	**NITROBROMOBENZENES, LIQUID**	6.1	III		P5	**A10.4.**
	UN3459	**NITROBROMOBENZENES, SOLID**	6.1	III		P5	**A10.5.**
	UN0340	**NITROCELLULOSE,** *dry or wetted with less than 25% water (or alcohol), by mass*	1.1D			P4	**A5.7.**
	UN3270	**NITROCELLULOSE MEMBRANE FILTERS**	4.1	II		P5, 43, A1	**A8.3.**
	UN0343	**NITROCELLULOSE, PLASTICIZED** *with not less than 18% plasticizing substance, by mass*	1.3C			P4	**A5.6.**
	UN2059	**NITROCELLULOSE SOLUTION, FLAMMABLE** *with not more than 12.6% nitrogen, by mass, and not more than 55% nitrocellulose*	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN0341	**NITROCELLULOSE,** *unmodified or plasticized with less than 18% plasticizing substance, by mass*	1.1D			P4	**A5.7.**
	UN0342	**NITROCELLULOSE, WETTED** *with 25% or more alcohol, by mass*	1.3C			P4	**A5.10.**
	UN2556	**NITROCELLULOSE WITH ALCOHOL** *25% or more alcohol by mass, and 12.6%or less nitrogen, by dry mass*	4.1	II		P5	**A8.3.**
	UN2555	**NITROCELLULOSE WITH WATER** *with not less than 25% water by mass*	4.1	II		P5	**A8.3.**
	UN2557	**NITROCELLULOSE, MIXTURE WITHOUT PLASTICIZER , WITHOUT PIGMENT** *with 12.6% or less nitrogen, by dry mass, or* **NITROCELLULOSE, MIXTURE WITHOUT PLASTICIZER, WITH PIGMENT** *with 12.6% or less nitrogen, by dry mass, or* **NITROCELLULOSE, MIXTURE WITH PLASTICIZER, WITHOUT PIGMENT** *with 12.6% or less nitrogen, by dry mass, or* **NITROCELLULOSE, MIXTURE WITH PLASTICIZER, WITH PIGMENT** *with 12.6% or less nitrogen, by dry mass*	4.1	II		P5	**A8.3.**
	UN2307	**3-NITRO-4-CHLOROBENZOTRIFLUORIDE**	6.1	II		P5	**A10.4.**
		Nitrochlorobenzene, see* CHLORONITROBENZENES, *etc					
	UN3434	**NITROCRESOLS, LIQUID**	6.1	III		P5	**A10.4.**
	UN2446	**NITROCRESOLS, SOLID**	6.1	III		P5	**A10.5.**

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		6-Nitro-4-diazotoluene-3-sulphonic acid (dry)					FORBIDDEN
		Nitro isobutene triol trinitrate					FORBIDDEN
		N-Nitro-N-methylglycola-mide nitrate					FORBIDDEN
		2-Nitro-2-methylpropanol nitrate					FORBIDDEN
	UN2842	**NITROETHANE**	3	III		P5	**A7.2.**
		Nitroethylene polymer					FORBIDDEN
		Nitroethyl nitrate					FORBIDDEN
	UN1066	**NITROGEN, COMPRESSED**	2.2			P5	**A6.3.**, **A6.5.**
	UN1067	**NITROGEN DIOXIDE**	2.3		5.1, 8		FORBIDDEN
		Nitrogen fertilizer solution; see **FERTILIZER AMMONIATING SOLUTION,** *etc.*					
		Nitrogen, mixtures with rare gases, see **RARE GASES AND NITROGEN MIXTURES**					
		Nitrogen peroxide, see **DINITROGEN TETROXIDE, LIQUEFIED**					
	UN1977	**NITROGEN, REFRIGERATED LIQUID** *(cryogenic liquid)*	2.2			P4	**A6.11.**
		Nitrogen tetroxide and nitric oxide mixtures, see **NITRIC OXIDE AND NITROGEN TETROXIDE MIXTURES**					
		Nitrogen tetroxide, see **DINITROGEN TETROXIDE, LIQUEFIED**					
		Nitrogen trichloride					FORBIDDEN
	UN2451	**NITROGEN TRIFLUORIDE**	2.2		5.1	P4	**A6.5.**
		Nitrogen triiodide					FORBIDDEN
		Nitrogen triiodide monoamine					FORBIDDEN
	UN2421	**NITROGEN TRIOXIDE**	2.3		5.1, 8		FORBIDDEN
*	UN3357	**NITROGLYCERIN, MIXTURE, DESENSITIZED LIQUID, N.O.S.,** *with less than 30% Nitroglycerin by mass*	3			P5	**A8.4.**
*	UN3343	**NITROGLYCERIN, MIXTURE, DESENSITIZED LIQUID, FLAMMABLE, N.O.S.,** *with less than 30% Nitroglycerin by mass*	3			P5	**A8.4.**
*	UN3319	**NITROGLYCERIN, MIXTURE, DESENSITIZED SOLID, N.O.S.,** *with more than 2% but not more than 10% Nitroglycerin by mass*	4.1	II		P4	**A8.4.**
	UN0143	**NITROGLYCERIN, DESENSITIZED** *with not less than 40% nonvolatile water insoluble phlegmatizer, by mass*	1.1D		6.1	P4	**A5.11.**
		Nitroglycerin, liquid, not desensitized					FORBIDDEN
	UN3064	**NITROGLYCERIN, SOLUTION IN ALCOHOL**, *with more than 1%, but not more than 5% nitroglycerin*	3	II		P3, N8	**A7.2.**
	UN0144	**NITROGLYCERIN, SOLUTION IN ALCOHOL** *with more than 1%, but not more than 10% nitroglycerin*	1.1D			P4	**A5.11.**
	UN1204	**NITROGLYCERIN SOLUTION IN ALCOHOL**, *with not more than 1% nitroglycerin*	3	II		P3, N34	**A7.2.**
		Nitroguanidine nitrate					FORBIDDEN

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN0282	**NITROGUANIDINE** *or* **PICRITE**, *dry or wetted with less than 20% water, by mass*	1.1D			P4	**A5.7.**
	UN1336	**NITROGUANIDINE WETTED**, *or* **PICRITE WETTED** *with not less than 20% water, by mass*	4.1	I		P4, 23, A8, A19, A20, N41	**A8.3.**
		1-Nitrohydantoin					FORBIDDEN
	UN1798	**NITROHYDROCHLORIC ACID**	8	I		P3, A3, N41	**A12.2.**
		Nitromannite (dry)					FORBIDDEN
	UN0133	**NITROMANNITE, WETTED** *with 40% or more water, or mixture of alcohol and water, by weight*	1.1D			P4	**A5.7.**
		NITROMANNITE, WETTED; *see* **MANNITOL HEXANITRATE, WETTED** *etc.*					
	UN1261	**NITROMETHANE**	3	II		P5	**A7.2.**
		N-Nitro-N-methylglycolamide nitrate					FORBIDDEN
		2-Nitro-2-methylpropanol nitrate					FORBIDDEN
		Nitromuriatic acid; see **NITROHYDROCHLORIC ACID**					
	UN2538	**NITRONAPHTHALENE**	4.1	III		P5, A1	**A8.3.**
+	UN1663	**NITROPHENOLS** *(o-,m-,p-,)*	6.1	III		P5	**A10.5.**
		m-Nitrophenyldinitro methane					FORBIDDEN
	UN3376	**4-NITROPHENYLHYDRAZINE** *with 30% or more water, by mass*	4.1				FORBIDDEN
	UN2608	**NITROPROPANES**	3	III		P5	**A7.2.**
	UN1369	**P-NITROSODIMETHYLANILINE**	4.2	II		P5, A19, A20, N34	**A8.3.**
	UN0146	**NITROSTARCH,** *dry or wetted with less than 20% water, by mass*	1.1D			P4	**A5.7.**
	UN1337	**NITROSTARCH, WETTED** *with not less than 20% water by mass*	4.1	I		P4, 23, A8, A19, A20, N41	**A8.3.**
		Nitrosugars (dry)					FORBIDDEN
	UN1069	**NITROSYL CHLORIDE**	2.3		8	P2, 3	**A6.4.**
	UN2308	**NITROSYLSULPHURIC ACID**, **LIQUID**	8	II		P5, A3, A6, A7, N34	**A12.2.**
	UN3456	**NITROSYLSULPHURIC ACID**, **SOLID**	8	II		P5, A3, A6, A7, N34	**A12.3.**
	UN1664	**NITROTOLUENES, LIQUID**	6.1	II		P5	**A10.4.**
	UN3446	**NITROTOLUENES, SOLID**	6.1	II		P5	**A10.6.**
	UN2660	**NITROTOLUIDINES (MONO)**	6.1	III		P5	**A10.5.**
	UN0490	**NITROTRIAZOLONE** *or* **NTO**	1.1D			P4	**A5.7.**
	UN0147	**NITRO UREA**	1.1D			P4	**A5.7.**
		Nitrous oxide and carbon dioxide mixtures see **CARBON DIOXIDE AND NITROUS; OXIDE MIXTURES**					
	UN1070	**NITROUS OXIDE**	2.2		5.1	P5	**A6.3.**, **A6.4.**
	UN2201	**NITROUS OXIDE, REFRIGERATED LIQUID**	2.2		5.1	P4	**A6.4.**
	UN1665	**NITROXYLENES, LIQUID**	6.1	II		P5	**A10.4.**
	UN3447	**NITROXYLENES, SOLID**	6.1	II		P5	**A10.5.**
	UN1920	**NONANES**	3	III		P5	**A7.2.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
		Nonflammable gas, n.o.s.; see **COMPRESSED** *or* **LIQUEFIED GASES,** *etc.*					
		Nonliquefied gases; see **COMPRESSED GASES**, *etc*					
		Nonliquefied hydrocarbon gas; see **HYDROCARBON GASES COMPRESSED, N.O.S.**					
	UN1799	**NONYLTRICHLOROSILANE**	8	II		P4, A7, N34	**A12.2.**
	UN2251	**2,5-NORBORNADIENE, STABILIZED**	3	II		P5	P7.3
	UN0490	**NTO**	1.1D			P4	**A5.7.**
	UN1800	**OCTADECYLTRICHLOROSILANE**	8	II		P4, A7, N34	**A12.2.**
	UN2309	**OCTADIENE**	3	II		P5	**A7.2.**
		1,7-Octadiene-3,5-diyne-1,8-dimethoxy-9-octadecyn oic acid					FORBIDDEN
	UN2422	**OCTAFLUOROBUT-2-ENE** *or* **REFRIGERANT GAS R1318**	2.2			P5	**A6.4.**
	UN1976	**OCTAFLUOROCYCLOBUTANE** *or* **REFRIGERANT GAS RC318**	2.2			P5	**A6.4.**
	UN2424	**OCTAFLUOROPROPANE** *or* **REFRIGERANT GAS R218**	2.2			P5	**A6.4.**
	UN1262	**OCTANES**	3	II		P5	**A7.2.**
	UN0484	**OCTOGEN, DESENSITIZED**	1.1D			P4	**A5.7.**
		Octogen (dry or unphlegmatized)					FORBIDDEN
	UN0226	**OCTOGEN, WETTED** *with not less than 15% water, by mass*	1.1D			P4	**A5.7.**
	UN0266	**OCTOLITE** *or* **OCTOL** *dry or wetted with less than 15% water by mass*	1.1D			P4	**A5.7.**
	UN0496	**OCTONAL**	1.1D			P4	**A5.8.**
	UN1191	**OCTYL ALDEHYDES**	3	III		P5	**A7.2.**
		Tert-Octyl Mercaptan, see **2-METHYL-2-HEPTANETHIOL**					
	UN1801	**OCTYLTRICHLOROSILANE**	8	II		P4, A7, N34	**A12.2.**
	UN1071	**OIL GAS, COMPRESSED**	2.3		2.1	P2, 6	**A6.4.**
		Oleum; see **SULPHURIC ACID, FUMING**					
		Organic Peroxide Type A, Liquid or Solid					FORBIDDEN
*	UN3101	**ORGANIC PEROXIDE TYPE B, LIQUID**	5.2	II	EXPLOSIVE	P3, 53	**Table A9.2.**5
*	UN3111	**ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED**	5.2	II	EXPLOSIVE	P3, 53	**Table A9.2.**5
*	UN3102	**ORGANIC PEROXIDE TYPE B, SOLID**	5.2	II	EXPLOSIVE	P3, 53	SEE BELOW BY TECHNICAL NAME
		tert-Butyl Monoperoxymaneate					**Table A9.3.**5
		3-Choloroperoxybenzoic Acid					**Table A9.3.**1
		Dibenzoyl Peroxide > 52 < 100					**Table A9.3.**2
		Dibenzoyl Peroxide > 78, < 94					**Table A9.3.**6
		Di-4-Chlorobenzoyl Peroxide					**Table A9.3.**5
		Di-2,4-Dichlorobenzoyl Peroxide					**Table A9.3.**5

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
		2,2-Dihydroperoxypropane					**Table A9.3.**5
		2,5-Dimethyl -2,5-di-(Benzoyl-Peroxy) Hexane					**Table A9.3.**5
		Di-(2 Phenoxyethyl) Peroxydicarbonate					**Table A9.3.**5
		Disuccinic Acid Peroxide					**Table A9.3.**4
		3,3,6,6,9,9,-Hexamethyl-1,2,4,5-Tetraoxa-cylcononane					**Table A9.3.**4
*	UN3112	**ORGANIC PEROXIDE TYPE B, SOLID, TEMPERATURE CONTROLLED**	5.2	II	EXPLOSIVE	P3, 53	SEE BELOW BY TECHNICAL NAME
		Acetyl Cylcohexanesulphonyl Peroxide					**Table A9.3.**4
		Dibenzyl Peroxydicarbonate					**Table A9.3.**5
		Dicyclohexyl Peroxydicarbonate					**Table A9.3.**5
		Diisopropyl Peroxydicarbonate					**Table A9.3.**2
		Di-(2-Methylbenzoyl) Peroxide					**Table A9.3.**5
*	UN3103	**ORGANIC PEROXIDE TYPE C, LIQUID**	5.2	II		P5	SEE BELOW BY TECHNICAL NAME
		tert-Amyl peroxybenzoate					**Table A9.2.**7
		n-Butyl-4,4-di-(Tertcutylperoxy)-Valerate					**Table A9.2.**5
		tert-Butyl Hydroperoxide					**Table A9.2.**5
		tert-Butyl Hydroperoxide and di-tert-Butyl Peroxide					**Table A9.2.**5
		tert-Butyl Monoperoxymaneate					**Table A9.2.**6
		tert-Butyl Peroxyacetate					**Table A9.2.**6
		tert-Butyl Peroxybenzoate					**Table A9.2.**5
		tert-Butylperoxy Isopropyl Carbonate					**Table A9.2.**5
		2,2-Di-(tert-Butylperoxy) Butane					**Table A9.2.**6
		1,1-Di-(tert-Butylperoxy) Cyclohexane					**Table A9.2.**5
		2,5-Dimethyl-2,5-Di-(tert-Butyl-Peroxy)Hexane -3					**Table A9.2.**5
		Ethyl-3,3-Di-(tert-Butylperoxy)-Butyrate					**Table A9.2.**5
		Organic Peroxide, Liquid, Sample					**Table A9.2.**2
*	UN3113	**ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED**	5.2	II		P3	SEE BELOW BY TECHNICAL NAME
		tert-Amyl Peroxypivalate					**Table A9.2.**5
		tert-Butyl Peroxydiethylacetate					**Table A9.2.**5
		tert-Butyl Peroxy-2-Ethylhexanoate					**Table A9.2.**6
		tert-Butyl Peroxypivalate					**Table A9.2.**5
		Di-sec-Butyl-Peroxydicarbonate					**Table A9.2.**4
		Di-(2-Ethylhexyl) Peroxydicarbonate					**Table A9.2.**5
		Di-n-Propyl Peroxydicarbonate					**Table A9.2.**4
		Organic Peroxide, Liquid Temperature Controlled					**Table A9.2.**2
*	UN3104	**ORGANIC PEROXIDE TYPE C, SOLID**	5.2	II		P5	SEE BELOW BY TECHNICAL NAME
		Cyclohexanone Peroxide(s)					**Table A9.3.**6
		Dibenzoyl Peroxide					**Table A9.3.**6

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
		2,5-Dimethyl-2-5-di-(Benzoyl Peroxy) Hexane					**Table A9.3.**5
		2,5-Dimethyl-2,5-Dihydroperoxyhexane					**Table A9.3.**6
		Organic Peroxide, Solid, Sample					**Table A9.3.**2
*	UN3114	**ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED**	5.2	II		P3	SEE BELOW BY TECHNICAL NAME
		Di-(4-tert-Butylcyclohexyl) Peroxydicarbonate					**Table A9.3.**6
		Dicyclohexyl Peroxydicarbonate					**Table A9.3.**3
		Dideconoyl Peroxide					**Table A9.3.**6
		Di-n-Octanoyl Peroxide					**Table A9.3.**5
		Organic Peroxide, Solid, Temperature Controlled					**Table A9.3.**2
*	UN3105	**ORGANIC PEROXIDE TYPE D, LIQUID**	5.2	II		P5	**Table A9.2.**7
		Acetyl acetone peroxide					
		Acetyl benzoyl peroxide					
		tert-Butyl cumyl peroxide					
		tert-Butyl hydroperoxide					
		tert-Butyl peroxybenzoate					
		tert-Butyl peroxycrotonate					
		tert-Butyl peroxydiethylacetate and tert-Butyl eroxybenzoate					
		tert-Butyl peroxy-3,5,5-trimethylhexanoate					
		Cyclohexanone peroxide(s)					
		1,1 Di-(tert-butylperoxy) cyclohexane					
		Di-(tert-butylperoxy) phthalate					
		2,2-Di-(tert-butylperoxy)-propane					
		2,5-Dimethyl-2,5-di-(tert-butyl-peroxy)hexane					
		2,5-Dimethyl-2,5-di-(3,5,5-trimethylhexanoylperoxy)					
		hexane					
		Ethyl-3,3-di-(tert-amylperoxy)-butryrate					
		Ethyl-3,3-di-(tert-butylperoxy)-butyrate					
		3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononan e					
		p-Methyl hydroperoxide					
		Methyl ethyl ketone peroxide(s)					
		Methyl isobutyl ketone peroxide(s)					
		Peroxyacetic acid, type D, stabilized					
		1,1,3,3-Tertamethylbutyl hydroperoxide					
*	UN3115	**ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED**	5.2	II		P3	**Table A9.2.**7
		Acetyl cyclohexanesulphonyl peroxide					
		tert-Amyl peroxy-2-ethylhexanoate					
		tert-Amyl peroxyneodecanoate					
		tert-Butyl peroxy-2-ethylhexanoate and 2,2-Di-(tert-butylperoxy)butane					

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
		tert-Butyl peroxyisobutyrate					
		tert-Butyl peroxyneodecanoate					
		tert-Butyl peroxypivalate					
		Cumyl peroxyneodecanoate					
		Cumyl peroxypivalate					
		Diacetone alcohol peroxides					
		Diacetyl peroxide					
		Di-n-butyl-peroxydicarbonate					
		Di-sec-butyl peroxydicarbonate					
		Di-(2-ethylhexyl) peroxydicarbonate					
		Diethyl peroxydicarbonate					
		Diisobutyryl peroxide					
		Diisopropyl peroxydicarbonate					
		Diisotridecyl peroxydicarbonate					
		2,5-Dimethyl-2,5-di-(2-ethylhexanoylperoxy)hexane					
		Di-(3,5,5-trimethylhexanoyl) peroxide					
		Methylcyclohexanone peroxide(s)					
		1,1,3,3-Tetramethylbutylperoxy-2-ethylhexanoate					
		2,4,4-Trimethylpentyl-2-peroxy phenoxyacetate					
*	UN3106	**ORGANIC PEROXIDE TYPE D, SOLID**	5.2	II		P5	Table A9.3.7
		Acetyl acetone peroxide, as a paste					
		n-Butyl-4-4-di-(tertbutyl-peroxy)-valerate					
		tert-Butyl peroxybenzoate					
		tert-Butyl-peroxy-2-ethylhexanoate and 2,2-Di-(tert-butylperoxy)butane					
		3-tert-Butylperoxy-3-phenylphthalide					
		tert-Butylperoxy stearylcarbonate					
		3-Chloroperoxybenzoic acid					
		Cyclohexanone peroxide(s) as a paste					
		Dibenzoyl peroxide					
		Dibenzoyl peroxide, as a paste					
		1,1-Di-(tert-butylperoxy) cyclohexane					
		2,2-Di(1,4-tert-butylperoxycyclohexyl)propane					
		Di-(2-tert -butylperoxyisopropyl)-benzene(s)					
		Di-(tert-butylperoxy) phthalate, as a paste					
		2,2-Di-(tert-butylperoxy)propane					
		1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane					
		Di-4-chlorobenzoyl peroxide, as a paste					
		Di-2,4-dichlorobenzoyl peroxide, as a paste with silicon oil					
		Di-(1-hydroxycyclohexyl) peroxide					
		Dilauroyl peroxide					
		2,5-Dimethyl-2,5-di-(tert-butyl-peroxy)hexyne-3					

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
		2,5-Dimethyl-2,5-di-(tert-butyl-peroxy) hexane					
		Di-(2 phenoxyethyl) peroxydicarbonate					
		Distearyl peroxydicarbonate					
		Ethyl-3,3-di-(tert-butylperoxy)-butyrate					
		3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononae					
		Tetrahydronaphthyl hydroperoxide					
*	UN3116	**ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED**	5.2	II		P3	**Table A9.3.**7
		Dicetyl peroxydicarbonate					
		Dimyristyl peroxydicarbonate					
		Di-n-nonanoyl peroxide					
		Diperoxy azelaic acid					
		Diperoxy DODecane diacid					
		Disuccinic acid peroxide					
		Di-(3,5,5-trimethyl-1,2-dioxo-lanyl-3)					
		peroxide, as a paste					
*	UN3107	**ORGANIC PEROXIDE TYPE E, LIQUID**	5.2	II		P5	**Table A9.2.**8
		tert-Amyl hydroperoxide					
		Di-tert-amyl peroxide					
		Di-tert-butyl peroxide					
		1,1-Di-(tert-butylperoxy)cyclohexane					
		Di-(tert-butylperoxy)phthalate					
		1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane					
		Methyl ethyl ketone peroxide(s)					
		Peroxyacetic acid, type E, stabilized					
*	UN3117	**ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED**	5.2	II		P3	SEE BELOW BY TECHNICAL NAME
		tert-Butyl peroxy-2-ethylhexanonate					**Table A9.2.**8
		Di-n-butyl peroxydicarbonate					**Table A9.2.**8
		Di-(2-ethylhexyl) peroxydicarbonate as a stable dispersion in water					**Table A9.2.**8
		Di-(2-Ethylhexyl) Peroxydicarbonate as a stable dispersion in water (frozen)					**Table A9.3.**8
		Dipropionyl peroxide					**Table A9.2.**8
*	UN3108	**ORGANIC PEROXIDE TYPE E, SOLID**	5.2	II		P5	**Table A9.3.**8
		tert-Butyl monoperoxymaleate, as a paste					
		Dibenzoyl peroxide, as a paste					
*	UN3118	**ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED**	5.2	II		P3	**Table A9.3.**8
*	UN3109	**ORGANIC PEROXIDE TYPE F, LIQUID**	5.2	II		P5	**Table A9.2.**8
		tert-Butylhydroperoxide					
		Cumyl hydroperoxide					
		Dilauroyl peroxide, as a stable dispersion in water					

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
		Isopropylcumyl hydroperoxide					
		p-Menthyl hydroperoxide					
		Peroxyacetic acid, Type F, stabilized					
		Pinanyl hydroperoxide					
*	UN3119	**ORGANIC PEROXIDE TYPE F, LIQUID TEMPERATURE CONTROLLED**	5.2	II		P3	**Table A9.2.**8
		Di-(4-tert-butylcyclohexyl) peroxydicarbonate, as a stable dispersion in water					
		Dicetyl peroxydicarbonate, as a stable dispersion in water					
		Dimyristyl peroxydicarbonate, as a stable dispersion in water					
*	UN3110	**ORGANIC PEROXIDE TYPE F, SOLID** *Dicumyl peroxide*	5.2	II		P5	**Table A9.3.**8
*	UN3120	**ORGANIC PEROXIDE TYPE F, SOLID**, **TEMPERATURE CONTROLLED**	5.2	II		P3	**Table A9.3.**8
	UN3313	**ORGANIC PIGMENTS, SELF-HEATING**	4.2	II III		P5 P5	**A8.3.** **A8.3.**
D	NA1955	**ORGANIC PHOSPHATE MIXED WITH COMPRESSED GAS, ORGANIC PHOSPHATE COMPOUND MIXED WITH COMPRESSED GAS** *or* **ORGANIC PHOSPHORUS COMPOUND MIXED WITH COMPRESSED GAS**	2.3				FORBIDDEN
*	UN3280	**ORGANOARSENIC COMPOUND, LIQUID N.O.S.**	6.1	I II III		P5, 5 P5 P5	**A10.4.** **A10.4.** **A10.4.**
	UN3465	**ORGANOARSENIC COMPOUND, SOLID N.O.S.**	6.1	I II III		P5, 5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
*	UN2762	**ORGANOCHLORINE PESTICIDES LIQUID**, **FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	I II	6.1 6.1	P3 P4	**A7.2.** **A7.2.**
*	UN2995	**ORGANOCHLORINE PESTICIDES, LIQUID**, **TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	I II III	3 3 3	P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN2996	**ORGANOCHLORINE PESTICIDES, LIQUID, TOXIC**	6.1	I II III		P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN2761	**ORGANOCHLORINE PESTICIDES, SOLID**, **TOXIC**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
*	UN3282	**ORGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S.**	6.1	I II III		P5 P5 P5	**A10.4.** **A10.4.** **A10.4.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
*	UN3467	**ORGANOMETALLIC COMPOUND, TOXIC, SOLID, N.O.S.**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
	UN3392	**ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC**	4.2				FORBIDDEN
	UN3394	**ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE**	4.2		4.3		FORBIDDEN
	UN3398	**ORGANOMETALLIC SUBSTANCE, LIQUID,, WATER-REACTIVE**	4.3	I		P3	**A8.2.**
				II		P4	**A8.2.**
				III		P5	**A8.2.**
	UN3399	**ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE**	4.3	I	3	P3	**A8.2.**
				II	3	P4	**A8.2.**
				III	3	P5	**A8.2.**
	UN3391	**ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC**	4.2				FORBIDDEN
	UN3393	**ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC, WATER-REACTIVE**	4.2		4.3		FORBIDDEN
	UN3400	**ORGANOMETALLIC SUBSTANCE, SOLID, SELF-HEATING**	4.2	II		P4	**A8.3.**
				III		P5	**A8.3.**
	UN3395	**ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE**	4.3	I	4.2	P3	**A8.3.**
				II		P4	**A8.3.**
				III		P5	**A8.3.**
	UN3396	**ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE**	4.3	I	4.1	P3	**A8.3.**
				II		P4	**A8.3.**
				III		P5	**A8.3.**
	UN3397	**ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, SELF-HEATING**	4.3	I	4.2		**A8.3.**
				II			**A8.3.**
				III			**A8.3.**
*	UN3279	**ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S.**	6.1	I	3	P3, 5	**A10.4.**
				II	3	P4	**A10.4.**
*	UN3278	**ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S.**	6.1	I		P3, 5	**A10.4.**
				II		P4	**A10.4.**
				III		P5	**A10.4.**
*	UN3464	**ORGANOPHOSPHORUS COMPOUND, TOXIC, SOLID, N.O.S.**	6.1	I		P3, 5	**A10.6.**
				II		P4	**A10.6.**
				III		P5	**A10.6.**
*	UN2784	**ORGANOPHOSPHOROUS PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	I	6.1	P3	**A7.2.**
				II	6.1	P4	**A7.2.**
*	UN3017	**ORGANOPHOSPHORUS PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	I	3	P3, N76	**A10.4.**
				II	3	P4, N76	**A10.4.**
				III	3	P5, N76	**A10.4.**

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*	UN3018	**ORGANOPHOSPHORUS PESTICIDES, LIQUID, TOXIC**	6.1	I		P3, N76	**A10.4.**
				II		P4, N76	**A10.4.**
				III		P5, N76	**A10.4.**
*	UN2783	**ORGANOPHOSPHORUS PESTICIDES, SOLID, TOXIC**	6.1	I		P5, N77	**A10.5.**
				II		P5, N77	**A10.5.**
				III		P5, N77	**A10.5.**
	UN2788	**ORGANOTIN COMPOUNDS, LIQUID, N.O.S.**	6.1	I		P3, A3, N33, N34	**A10.4.**
				II			**A10.4.**
				III		P4, A3, N33, N34	**A10.4.**
						P5	
	UN3146	**ORGANOTIN COMPOUNDS, SOLID, N.O.S.**	6.1	I		P5, A5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
*	UN2787	**ORGANOTIN PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	I	6.1	P3	**A7.2.**
				II	6.1	P4	**A7.2.**
*	UN3019	**ORGANOTIN PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint more than 23 degrees C*	6.1	I	3	P3	**A10.4.**
				II	3	P4	**A10.4.**
				III	3	P5	**A10.4.**
*	UN3020	**ORGANOTIN PESTICIDES, LIQUID, TOXIC**	6.1	I		P3	**A10.4.**
				II		P4	**A10.4.**
				III		P5	**A10.4.**
*	UN2786	**ORGANOTIN PESTICIDES, SOLID, TOXIC**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
		Orthonitroaniline, see* NITROANILINES, *etc					
	UN2471	**OSMIUM TETROXIDE**	6.1	I		P5, A8, N33, N34	**A10.5.**
D	NA3082	**OTHER REGULATED SUBSTANCES, LIQUID, N.O.S.**	9	III		P5	**A13.2.**
D	NA3077	**OTHER REGULATED SUBSTANCES, SOLID, N.O.S.**	9	III		P5	**A13.2.**
*	UN3098	**OXIDIZING LIQUID, CORROSIVE, N.O.S.**	5.1	I	8	P3	**A9.5.**
				II	8	P4	**A9.5.**
				III	8	P5	**A9.5.**
*	UN3139	**OXIDIZING LIQUID, N.O.S.**	5.1	I		P3, A2	**A9.5.**
				II		P4, A2	**A9.5.**
				III		P5, A2	**A9.5.**
*	UN3099	**OXIDIZING LIQUID, TOXIC, N.O.S.**	5.1	I	6.1	P3	**A9.5.**
				II	6.1	P4	**A9.5.**
				III	6.1	P5	**A9.5.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
*	UN3085	**OXIDIZING SOLID, CORROSIVE, N.O.S.**	5.1	I	8	P5	**A9.6.**
				II	8	P5	**A9.6.**
				III	8	P5	**A9.6.**
*	UN3137	**OXIDIZING SOLID, FLAMMABLE, N.O.S.**	5.1	I	4.1	P4	**A9.8.**
*	UN1479	**OXIDIZING SOLID, N.O.S.**	5.1	I		P5	**A9.6.**
				II		P5	**A9.6.**
				III		P5	**A9.6.**
*	UN3100	**OXIDIZING SOLID, SELF-HEATING, N.O.S.**	5.1	II	4.2	P4	**A9.8.**
*	UN3087	**OXIDIZING SOLID, TOXIC, N.O.S.**	5.1	I	6.1	P5	**A9.6.**
				II	6.1	P5	**A9.6.**
				III	6.1	P5	**A9.6.**
*	UN3121	**OXIDIZING SOLID, WATER-REACTIVE, N.O.S.**	5.1		4.3	P4	**A9.8.**
	UN1072	**OXYGEN, COMPRESSED**	2.2		5.1	P5	**A6.3.**, **A6.5.**
	UN2190	**OXYGEN DIFLUORIDE. COMPRESSED**	2.3		5.1, 8	P1, 1, N86	**A6.4.**
	UN3356	**OXYGEN GENERATORS, CHEMICAL**	5.1	II		P4, 60	**A9.10.**
+	NA3356	**OXYGEN GENERATOR, CHEMICAL SPENT**	9	III			FORBIDDEN
	UN1073	**OXYGEN, REFRIGERATED LIQUID** *(cryogenic liquid)*	2.2		5.1	P4	**A6.11.**
	UN1263	**PAINT** *(including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, and liquid lacquer base) or* **PAINT RELATED MATERIAL** *(including paint thinning or reducing compounds)*	3	I		P3	**A7.2.**
				II		P5	**A7.2.**
				III		P5	**A7.2.**
	UN3066	**PAINT** *or* **PAINT RELATED MATERIAL**	8	II		P5	**A12.2.**
				III		P5	**A12.2.**
	UN1379	**PAPER, UNSATURATED OIL TREATED** *incompletely dried (including carbon paper)*	4.2	III		P5	**A8.3.**
	UN2213	**PARAFORMALDEHYDE**	4.1	III		P5, A1	**A8.3.**
	UN1264	**PARALDEHYDE**	3	III		P5	**A7.2.**
D	NA1967	**PARATHION AND COMPRESSED GAS MIXTURE**	2.3			P2, 3	**A6.18.**
		Paris green, solid, see **COPPER ACETOARSENITE**					
		Patient/Diagnostic Specimens				A508	
		PCB, *see* **POLYCHLORINATED BIPHENYLS**					
+	UN1380	**PENTABORANE**	4.2		6.1		FORBIDDEN
	UN1669	**PENTACHLOROETHANE**	6.1	II		P5	**A10.4.**
	UN3155	**PENTACHLOROPHENOL**	6.1	II		P5	**A10.5.**
		Pentaerythrite Tetranitrate (dry)					FORBIDDEN

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	UN0150	**PENTAERYTHRITE TETRANITRATE, WETTED** *or* **PENTAERYTHRITOL TETRANITRATE, WETTED** *or* **PETN, WETTED** *with not less than 25% water by mass, or* **PENTAERYTHRITE TETRANITRATE** *or* **PENTAERYTHRITOL TETRANITRATE** *or* **PETN; DESENSITIZED** *with not less than 15% phlegmatizer by mass*	1.1D			P4	**A5.7.**
	UN0411	**PENTAERYTHRITE TETRANITRATE** *or* **PENTAERYTHRITOL TETRANITRATE** *or* **PETN,** *with not less than 7% wax by mass*	1.1D			P4	**A5.7.**
*	UN3344	**PENTAERYTHRITE TETRANITRATE MIXTURE, DESENSITIZED SOLID, N.O.S.***with more than 10% but not more than 20% PETN by mass*	4.1	II		P4	**A8.4.**
		PENTAERYTHRITOL TETRANITRATE; *see* **PENTAERYTHRITE TETRANITRATE,** *etc.*					
	UN3220	**PENTAFLUOROETHANE** *or* **REFRIGERANT GAS R125**	2.2			P5	**A6.3.**, **A6.4.**
	UN2286	**PENTAMETHYLHEPTANE**	3	III		P5	**A7.2.**
	UN2310	**PENTAN-2,4-DIONE**	3	III	6.1	P5	**A7.2.**
	UN1265	**PENTANES**	3	I II		P3 P5	**A7.2.** **A7.2.**
		Pentanitroaniline (dry)					FORBIDDEN
	UN1108	**1-PENTENE (N-AMYLENE)**	3	I		P3	**A7.2.**
	UN2705	**1-PENTOL**	8	II		P5	**A12.2.**
	UN1105	**PENTANOLS**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN0151	**PENTOLITE,** *dry or wetted with less than 15% water by mass*	1.1D			P4	**A5.7.**
		***Pepper spray, see* AEROSOLS, *etc. or* SELF-DEFENSE SPRAY, NON-PRESSURIZED**					
	UN1481	**PERCHLORATES, INORGANIC, N.O.S.**	5.1	II III		P5 P5	**A9.6.** **A9.6.**
	UN3211	**PERCHLORATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.**	5.1	II		P5	**A9.5.**
		Perchloric Acid, with more than 72% acid by mass					FORBIDDEN
	UN1873	**PERCHLORIC ACID** *more than 50% but not more than 72% acid, by mass*	5.1	I	8	P3, A2, A3, N41	**A9.5.**
	UN1802	**PERCHLORIC ACID** *not more than 50% acid by mass*	8	II	5.1	P4, N41	**A12.2.**
		Perchloroethylene; see **TETRACHLOROETHYLENE**					
	UN1670	**PERCHLOROMETHYL MERCAPTAN**	6.1	I		P2, 2, A3, A7, N34	**A10.6.**
	UN3083	**PERCHLORYL FLUORIDE**	2.3		5.1	P2, 2	**A6.5.**
		Percussion Caps; *see* **PRIMERS, CAP TYPE**					
	UN3154	**PERFLUORO (ETHYL VINYL ETHER)**	2.1			P4	**A6.3.**, **A6.4.**, **A6.5.**
	UN3153	**PERFLUORO (METHYL VINYL ETHER)**	2.1			P4	**A6.3.**, **A6.4.**, **A6.5.**

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		Perfluoro-2-butene; see **OCTAFLUOROBUT-2-ENE**					
	UN1266	**PERFUMERY PRODUCTS** *with flammable solvents*	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN1482	**PERMANGANATES, INORGANIC, N.O.S.**	5.1	II III		P5, A30 P5, A30	**A9.6.** **A9.6.**
	UN3214	**PERMANGANATES, INORGANIC AQUEOUS SOLUTIONS, N.O.S.**	5.1	II		P5	**A9.5.**
	UN1483	**PEROXIDES, INORGANIC, N.O.S.**	5.1	II III		P5, A7, A20, N34 P5, A7, A20, N34	**A9.6.** **A9.6.**
		Peroxyacetic acid, more than 43% and with more than 6% hydrogen peroxide					FORBIDDEN
	UN3215	**PERSULFATES, INORGANIC, N.O.S.**	5.1	III		P5	**A9.6.**
	UN3216	**PERSULFATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.**	5.1	III		P5	**A9.5.**
*	UN3021	**PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	I II	6.1 6.1	P3 P4	**A7.2.** **A7.2.**
*	UN2903	**PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S.** *flashpoint not less than 23 degrees C*	6.1	I II III	3 3 3	P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN2902	**PESTICIDES, LIQUID, TOXIC, N.O.S.**	6.1	I II III		P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN2588	**PESTICIDES, SOLID, TOXIC, N.O.S.**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
		PETN; *see* **PENTAERYTHRITE TETRANITRATE**	1.1D				
		PETN/TNT; *see* **PENTOLITE,** *etc*					
	UN0411	**PETN** ***with 7%or more wax, by weight***	1.1D			P4	**A5.7.**
	UN0150	**PETN, DESENSITIZED** ***with 15% or more phlegmatizer, by weight or*** **PETN, WETTED** ***with 25% or more water, by weight***	1.1D			P4	**A5.7.**
		PETROL; *see* **GASOLINE**					
	UN1267	**PETROLEUM CRUDE OIL**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
	UN1268	**PETROLEUM DISTILLATES, N.O.S.** *or* **PETROLEUM PRODUCTS, N.O.S.**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
	UN1075	**PETROLEUM GASES, LIQUEFIED** *or* **LIQUEFIED PETROLEUM GAS**	2.1			P4	**A6.3.**, **A6.6.**

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D	NA1270	**PETROLEUM OIL**	3	I		P3	**A7.2.**
				II		P5	**A7.2.**
				III		P5	**A7.2.**
	UN2645	**PHENACYL BROMIDE**	6.1	II		P5	**A10.5.**
+	UN2311	**PHENETIDINES**	6.1	III		P5	**A10.4.**
	UN2904	**PHENOLATES,** *liquid*	8	III		P5	**A12.2.**
	UN2905	**PHENOLATES,** *solid*	8	III		P5	**A12.3.**
	UN2312	**PHENOL, MOLTEN**	6.1				FORBIDDEN
+	UN1671	**PHENOL, SOLID**	6.1	II		P5, N78	**A10.5.**
	UN2821	**PHENOL SOLUTIONS**	6.1	II		P5	**A10.4.**
				III		P5	**A10.4.**
	UN1803	**PHENOLSULFONIC ACID, LIQUID**	8	II		P5, N41	**A12.2.**
*	UN3346	**PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC** *(flashpoint less than 23 degrees C)*	3	I	6.1	P3	**A7.2.**
				II	6.1	P4	**A7.2.**
*	UN3348	**PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC**	6.1	I		P3	**A10.4.**
				II		P4	**A10.4.**
				III		P5	**A10.4.**
*	UN3347	**PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC** *(flashpoint not less than 23 degrees C)*	6.1	I	3	P3	**A10.4.**
				II	3	P4	**A10.4.**
				III	3	P5	**A10.4.**
*	UN3345	**PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
	UN2470	**PHENYLACETONITRILE, LIQUID**	6.1	III		P5	**A10.4.**
	UN2577	**PHENYLACETYL CHLORIDE**	8	II		P5	**A12.2.**
	UN1672	**PHENYLCARBYLAMINE CHLORIDE**	6.1	I		P2, 2	**A10.6.**
	UN2746	**PHENYL CHLOROFORMATE**	6.1	II	8	P4	**A10.4.**
		m-Phenylene diaminediperchlorate (dry)					FORBIDDEN
+	UN1673	**PHENYLENEDIAMINES** *(o-,m-,p-)*	6.1	III		P5	**A10.5.**
	UN2572	**PHENYLHYDRAZINE**	6.1	II		P5	**A10.4.**
	UN2487	**PHENYL ISOCYANATE**	6.1	II	3	P2, 2, N33, N34	**A10.6.**
	UN2337	**PHENYL MERCAPTAN**	6.1	I	3	P2, 2	**A10.6.**
	UN1674	**PHENYLMERCURIC ACETATE**	6.1	II		P5	**A10.5.**
	UN2026	**PHENYLMERCURIC COMPOUNDS, N.O.S.**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
	UN1894	**PHENYLMERCURIC HYDROXIDE**	6.1	II		P5	**A10.5.**
	UN1895	**PHENYLMERCURIC NITRATE**	6.1	II		P5	**A10.5.**
	UN2798	**PHENYL PHOSPHORUS DICHLORIDE**	8	II		P4	**A12.2.**
	UN2799	**PHENYL PHOSPHOROUS THIODICHLORIDE**	8	II		P4	**A12.2.**

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	UN3002	**PHENYL UREA PESTICIDES, LIQUID, TOXIC**	6.1	I II III		P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
	UN1804	**PHENYLTRICHLOROSILANE**	8	II		P4, A7, N34	**A12.2.**
	UN1076	**PHOSGENE**	2.3		8	P1, 1	**A6.15.**
	UN2940	**9-PHOSPHABICYCLONONANES** *or* **CYCLOOCTADIENE PHOSPHINES**	4.2	II		P5, A19	**A8.3.**
	UN2199	**PHOSPHINE**	2.3		2.1	P1, 1	**A6.15.**
		Phosphoric acid triethyleneimine; *see* **TRIS-(1-AZIRIDIYL) PHOSPHINE OXIDE, SOLUTION**					
		PHOSPHINE OXIDE, SOLUTION *Phosphoric Anhydride; see* **PHOSPHORUS PENTOXIDE**					
	UN1805	**PHOSPHORIC ACID , SOLUTION**	8	III		P5, A7, N34	**A12.2.**
	UN3453	**PHOSPHORIC ACID, SOLID**	8	III		P5, A7, N34	**A12.3.**
	UN2834	**PHOSPHOROUS ACID**	8	III		P5	**A12.3.**
	UN1338	**PHOSPHORUS, AMORPHOUS**	4.1	III		P5, A1, A19	**A8.3.**
		Phosphorus bromide, see **PHOSPHORUS TRIBROMIDE**					
		Phosphorus chloride, see **PHOSPHORUS TRICHLORIDE**					
	UN1339	**PHOSPHORUS HEPTASULPHIDE,** *free from yellow or white phosphorus*	4.1	II		P5, A20, N34	**A8.3.**
	UN1939	**PHOSPHORUS OXYBROMIDE**	8	II		P5, N41, N43	**A12.3.**
	UN2576	**PHOSPHORUS OXYBROMIDE, MOLTEN**	8				FORBIDDEN
+	UN1810	**PHOSPHORUS OXYCHLORIDE**	8	II	6.1	P2, 2, A7, N34	**A12.11.**
	UN2691	**PHOSPHORUS PENTABROMIDE**	8	II		P4, A7, N34	**A12.2.**
	UN1806	**PHOSPHORUS PENTACHLORIDE**	8	II		P4, A7, N34	**A12.2.**
	UN2198	**PHOSPHORUS PENTAFLUORIDE**	2.3		8	P1, 2	**A6.4.**, **A6.5.**
	UN1340	**PHOSPHORUS PENTASULPHIDE**, *free from yellow or white phosphorus*	4.3	II	4.1	P5, A20	**A8.3.**
		Phosphorus pentasulphide, with yellow and/or white phosphorus					FORBIDDEN
	UN1807	**PHOSPHORUS PENTOXIDE**	8	II		P4, A7, N34	**A12.3.**
	UN1341	**PHOSPHORUS SESQUISULPHIDE**, *free from yellow or white phosphorus*	4.1	II		P5, A20, N34	**A8.3.**
		Phosphorus sesquisulphide, with yellow and/or white phosphorus					FORBIDDEN
	UN1808	**PHOSPHORUS TRIBROMIDE**	8	II		P4, A3, A6, A7, N34, N43	**A12.2.**
	UN1809	**PHOSPHORUS TRICHLORIDE**	6.1	I	8	P2, 2, N34	**A12.11.**
	UN2578	**PHOSPHORUS TRIOXIDE**	8	III		P5	**A12.3.**
	UN1343	**PHOSPHORUS TRISULPHIDE,** *free from yellow or white phosphorus*	4.1	II		P5, A20, N34	**A8.3.**
		Phosphorus trisulphide, with yellow and/or white phosphorus					FORBIDDEN
	UN2447	**PHOSPHORUS WHITE, MOLTEN**	4.2		6.1		FORBIDDEN

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		Phosphorus (white or red) and a chlorate, mixtures of					FORBIDDEN
	UN1381	**PHOSPHORUS, WHITE DRY** *or* **PHOSPHORUS, WHITE, UNDER WATER** *or* **PHOSPHORUS WHITE IN SOLUTION** *or* **PHOSPHORUS YELLOW DRY** *or* **PHOSPHORUS YELLOW UNDER WATER** *or* **PHOSPHORUS YELLOW IN SOLUTION**	4.2	I	6.1	P3, N34	**A8.16.**
		Phosphoryl Chloride; see **PHOSPHORUS OXYCHLORIDE**					
	UN2214	**PHTHALIC ANHYDRIDE** *with more than .05% maleic anhydride*	8	III		P5	**A12.3.**
	UN2313	**PICOLINES**	3	III		P5	**A7.2.**
	UN0153	**PICRAMIDE**	1.1D			P4	**A5.8.**
	UN0154	**PICRIC ACID**	1.1D			P4	**A5.7.**
	UN3364	**PICRIC ACID, WETTED *with 10% or more water, by weight***	4.1	I		P4, A8, A19, N41	**A8.3.**
	UN0282	**PICRITE *dry or wetted with less than 20% water, by weight***	1.1D			P4	**A5.7.**
	UN1336	**PICRITE, WETTED *with 20% or more water, by weight***	4.1	I		P4, 23, A8, A19, A20, N41	**A8.3.**
		Picrite;see **NITROGUANIDINE,** *etc*					
		Picryl Chloride; see **TRINITROCHLOROBENZENE**					
	UN0155	**PICRYL CHLORIDE**	1.1D			P4	**A5.8.**
	UN3365	**PICRYL CHLORIDE, WETTED *with 10% or more water, by weight***	4.1	I		P4	**A8.3.**
	UN2368	**ALPHA-PINENE**	3	III		P5	**A7.2.**
	UN1272	**PINE OIL**	3	III		P5	**A7.2.**
	UN2579	**PIPERAZINE**	8	III		P5	**A12.3.**
	UN2401	**PIPERIDINE**	8	I	3	P4	**A12.2.**
		Pivaloyl Chloride; *see* **TRIMETHYLACETYL CHLORIDE**					
	UN3314	**PLASTIC MOULDING COMPOUND** *in dough, sheet, or extruded rope form evolving flammable vapor*	9	III		P5	**A13.17.**
*	UN2006	**PLASTICS, NITROCELLULOSE BASED, SELF- HEATING, N.O.S.**	4.2	III		P2	**A8.3.**
		Plastic solvent, n.o.s.; see **FLAMMABLE LIQUIDS, N.O.S**.					
		Poisonous gases, n.o.s.; see **COMPRESSED** *or* **LIQUEFIED GASES, FLAMMABLE** *or* **TOXIC, N.O.S.**					
*	UN2733	**POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S.**	3	I II III	8 8 8	P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
*	UN2735	**POLYAMINES, LIQUID, CORROSIVE, N.O.S.**	8	I II III		P5 P5 P5	**A12.2.** **A12.2.** **A12.2.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
*	UN2734	**POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.**	8	I II	3 3	P5 P5	**A12.2.** **A12.2.**
*	UN3259	**POLYAMINES, SOLID, CORROSIVE, N.O.S.**	8	I II III		P5 P5 P5	**A12.3.** **A12.3.** **A12.3.**
		Polyalkylamines, n.o.s., see* AMINES, *etc					
	UN2315	**POLYCHLORINATED BIPHENYLS, LIQUID**	9	II		P5, 9	**A13.2.**
	UN3432	**POLYCHLORINATED BIPHENYLS, SOLID**	9	II		P5, 9	**A13.2.**
	UN3269	**POLYESTER RESIN KIT**	3	II III		P5 P5	**A7.6.** **A7.6.**
	UN3151	**POLYHALOGENATED BIPHENYLS, LIQUID** *or* **POLYHALOGENATED TERPHENYLS, LIQUID**	9	II		P5	**A13.2.**
	UN3152	**POLYHALOGENATED BIPHENYLS, SOLID,** *or* **POLYHALOGENATED TERPHENYLS, SOLIDS**	9	II		P5	**A13.2.**
	UN2211	**POLYMERIC BEADS, EXPANDABLE,** *evolving flammable vapor*	9	III		P5	**A13.17.**
	UN2257	**POTASSIUM**	4.3	I		P3, A19, A20, N6, N34	**A8.3.**
	UN1677	**POTASSIUM ARSENATE**	6.1	II		P5	**A10.5.**
	UN1678	**POTASSIUM ARSENITE**	6.1	II		P5	**A10.5.**
		Potassium bisulfite solution, see **BISULFITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.**					
	UN1870	**POTASSIUM BOROHYDRIDE**	4.3	I		P3, A19, N40	**A8.3.**
	UN1484	**POTASSIUM BROMATE**	5.1	II		P5	**A9.6.**
		Potassium Carbonyl					FORBIDDEN
	UN1485	**POTASSIUM CHLORATE**	5.1	II		P5, A9, N34	**A9.6.**
	UN2427	**POTASSIUM CHLORATE, AQUEOUS SOLUTION**	5.1	II III		P5, A2 P5, A2	**A9.5.** **A9.5.**
		***Potassium chlorate mixed with mineral oil, see* EXPLOSIVE BLASTING, TYPE C**					
	UN1679	**POTASSIUM CUPROCYANIDE**	6.1	II		P5	**A10.5.**
	UN1680	**POTASSIUM CYANIDE, SOLID**	6.1	I		P5, N74, N75	**A10.5.**
	UN3413	**POTASSIUM CYANIDE, SOLUTION**	6.1	I		P5, N74, N75	**A10.4.**
	UN1929	**POTASSIUM DITHIONITE** *or* **POTASSIUM HYDROSULFITE**	4.2	II		P5, A8, A19, A20	**A8.3.**
	UN1812	**POTASSIUM FLUORIDE, SOLID**	6.1	III		P5	**A10.5.**
	UN3422	**POTASSIUM FLUORIDE, SOLUTION**	6.1	III		P5	**A10.4.**
	UN2628	**POTASSIUM FLUOROACETATE**	6.1	I		P5	**A10.5.**
	UN2655	**POTASSIUM FLUOROSILICATE**	6.1	III		P5	**A10.5.**
		Potassium hydrate; see **POTASSIUM HYDROXIDE, SOLID**					
		Potassium hydrogen fluoride; see **POTASSIUM HYDROGENDIFLUORIDE**					

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	UN1811	**POTASSIUM HYDROGENDIFLUORIDE**, **SOLID**	8	II	6.1	P5, N3, N34	**A12.3.**
	UN3421	**POTASSIUM HYDROGENDIFLUORIDE, SOLUTION**	8	II	6.1	P5, N3, N34	**A12.2.**
		Potassium hydrogen fluoride solution; see **CORROSIVE LIQUID, N.O.S.**					
	UN2509	**POTASSIUM HYDROGEN SULPHATE**	8	II		P5, A7,N34	**A12.3.**
	UN1929	**POTASSIUM HYDROSULPHITE**	4.2	II		P5, A19, A20, N34	**A8.3.**
	UN1813	**POTASSIUM, HYDROXIDE, SOLID**	8	II		P5	**A12.3.**
	UN1814	**POTASSIUM HYDROXIDE, SOLUTION**	8	II III		P5 P5	**A12.2.** **A12.2.**
		Potassium hypochlorite, solution, see **HYPOCHLORITE SOLUTIONS,** *etc*					
	UN1420	**POTASSIUM, METAL ALLOYS**, **LIQUID**	4.3	I		P3, A19, A20	**A8.2.**
	UN3403	**POTASSIUM METAL ALLOYS, SOLID**	4.3	I		P3, A19, A20	**A8.3.**
		Potassium metal, liquid alloy; see **ALKALI METAL ALLOYS, LIQUID**					
	UN2864	**POTASSIUM METAVANADATE**	6.1	II		P5	**A10.5.**
	UN2033	**POTASSIUM MONOXIDE**	8	II		P5	**A12.3.**
	UN1486	**POTASSIUM NITRATE**	5.1	III		P5, A1, A29	**A9.6.**
	UN1487	**POTASSIUM NITRATE AND SODIUM NITRITE MIXTURES**	5.1	II		P5	**A9.6.**
	UN1488	**POTASSIUM NITRITE**	5.1	II		P5	**A9.6.**
	UN1489	**POTASSIUM PERCHLORATE,** *solid or solution*	5.1	II		P5	**A9.5.**, **A9.6.**
	UN1490	**POTASSIUM PERMANGANATE**	5.1	II		P5	**A9.6.**
	UN1491	**POTASSIUM PEROXIDE**	5.1	I		P5, A20, N34	**A9.6.**
	UN1492	**POTASSIUM PERSULFATE**	5.1	III		P5, A1, A29	**A9.6.**
	UN2012	**POTASSIUM PHOSPHIDE**	4.3	I	6.1	P3, A19, N40	**A8.3.**
		Potassium selenate; *see* **SELENATES**					
		Potassium selenite; see **SELENITES**					
	UN1422	**POTASSIUM SODIUM ALLOYS**, **LIQUID**	4.3	I		P3, A19 N34, N40	**A8.2.**
	UN3404	**POTASSIUM SODIUM ALLOYS**, **SOLID**	4.3	I		P3, A19 N34, N40	**A8.3.**
	UN1382	**POTASSIUM SULPHIDE**, **ANHYDROUS** *or* **POTASSIUM SULPHIDE** *with less than 30% water of crystallization*	4.2	II		P5, A19, A20, N34	**A8.3.**
	UN1847	**POTASSIUM SULPHIDE, HYDRATED** *with not less than 30% water of crystallization*	8	II		P5	**A12.3.**
	UN2466	**POTASSIUM SUPEROXIDE**	5.1	I		P5, A20	**A9.6.**
	UN0433	**POWDER CAKE, WETTED**, *with 17% or more alcohol, by weight or* **POWDER PASTE, WETTED** *with 17% or more alcohol by weight*	1.1C			P4	**A5.6.**
	UN0159	**POWDER CAKE, WETTED,** *or* **POWDER PASTE, WETTED** *with not less than 25% water, by mass*	1.3C			P4	**A5.6.**
		Powder Paste, see **POWDER CAKE**					

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	UN0160	**POWDER, SMOKELESS**	1.1C			P4, A69	**A5.10.**
	UN0161	**POWDER, SMOKELESS**	1.3C			P4, A69	**A5.10.**
		Power device,,explosive;see **CARTRIDGES, POWER DEVICE**					
	UN0044	**PRIMERS, CAP TYPE**	1.4S			P5, A69	**A5.17.**
	UN0377	**PRIMERS, CAP TYPE**	1.1B			P4, A69	**A5.17.**
	UN0378	**PRIMERS, CAP TYPE**	1.4B			P5, A69	**A5.17.**
		Primers small arms, see **PRIMERS, CAP TYPE**					
	UN0319	**PRIMERS, TUBULAR**	1.3G			P4	**A5.17.**
	UN0320	**PRIMERS, TUBULAR**	1.4G			P5	**A5.17.**
	UN0376	**PRIMERS, TUBULAR**	1.4S			P5, A69	**A5.17.**
	UN1210	**PRINTING INK,** *flammable* or **PRINTING INK RELATED MATERIAL** (including printing ink thinning or reducing compound) flammable	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
		Projectiles illuminating;see **AMMUNITION, ILLUMINATING,** *etc*					
	UN0345	**PROJECTILES,** *inert with tracer*	1.4S			P5, A69	**A5.13.**
	UN0424	**PROJECTILES**, *inert, with tracer*	1.3G			P4	**A5.13.**
	UN0425	**PROJECTILES**, *inert, with tracer*	1.4G			P5	**A5.13.**
	UN0346	**PROJECTILES**, *with burster or expelling charge*	1.2D			P4	**A5.13.**
	UN0347	**PROJECTILES,** *with burster or expelling charge*	1.4D			P5	**A5.13.**
	UN0426	**PROJECTILES,** *with burster or expelling charge*	1.2F			P4	**A5.13.**
	UN0434	**PROJECTILES,** *with burster or expelling charge*	1.2G			P4	**A5.13.**
	UN0427	**PROJECTILES**, *with burster or expelling charge*	1.4F			P5	**A5.13.**
	UN0435	**PROJECTILES,** *with burster or expelling charge*	1.4G			P5	**A5.13.**
	UN0344	**PROJECTILES**, *with bursting charge*	1.4D			P5	**A5.13.**
	UN0168	**PROJECTILES,** *with bursting charge*	1.1D			P4	**A5.13.**
	UN0167	**PROJECTILES,** *with bursting charge*	1.1F			P4	**A5.13.**
	UN0169	**PROJECTILES,** *with bursting charge*	1.2D			P4	**A5.13.**
	UN0324	**PROJECTILES,** *with bursting charge*	1.2F			P4	**A5.13.**
	UN2200	**PROPADIENE, STABILIZED**	2.1			P4	**A6.4.**
	UN1978	**PROPANE,** *see also* **PETROLEUM GASES, LIQUEFIED**	2.1			P4	**A6.3.**, **A6.6.**
	UN2402	**PROPANETHIOLS**	3	II		P5	**A7.2.**
	UN1274	**N-PROPANOL** *or* **PROPYL ALCOHOL, NORMAL**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN0495	**PROPELLANT, LIQUID**	1.3C			P4	**A5.11.**
	UN0497	**PROPELLANT, LIQUID**	1.1C			P4	**A5.11.**
	UN0498	**PROPELLANT, SOLID**	1.1C			P4	**A5.10.**
	UN0499	**PROPELLANT, SOLID**	1.3C			P4	**A5.10.**
	UN0501	**PROPELLANT, SOLID**	1.4C				FORBIDDEN
	UN1275	**PROPIONALDEHYDE**	3	II		P5	**A7.2.**
	UN1848	**PROPIONIC ACID**	8	III		P5	**A12.2.**
	UN2496	**PROPIONIC ANHYDRIDE**	8	III		P5	**A12.2.**

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	UN2404	**PROPIONITRILE**	3	II	6.1	P4	**A7.2.**
	UN1815	**PROPIONYL CHLORIDE**	3	II	8	P5	**A7.2.**
	UN1276	**N-PROPYL ACETATE**	3	II		P5	**A7.2.**
	UN1277	**PROPYLAMINE**	3	II	8	P5, N34	**A7.2.**
	UN2364	**N-PROPYL BENZENE**	3	III		P5	**A7.2.**
	UN2740	**N-PROPYL CHLOROFORMATE**	6.1	I	3, 8	P2, 2, A3, A6, A7, N34	**A10.6.**
	UN1077	**PROPYLENE** *see also* **PETROLEUM GASES, LIQUEFIED**	2.1			P4	**A6.3.**, **A6.4.**
	UN2611	**PROPYLENE CHLOROHYDRIN**	6.1	II	3	P5	**A10.4.**
	UN2258	**1,2-PROPYLENEDIAMINE**	8	II	3	P5, A3, A6, N34	**A12.3.**
	UN1921	**PROPYLENEIMINE, STABILIZED**	3	I	6.1	P3, A3, N34	**A7.2.**
	UN1280	**PROPYLENE OXIDE**	3	I		P3, A3, N34	**A7.2.**
	UN2850	**PROPYLENE TETRAMER**	3	III		P5	**A7.2.**
	UN1281	**PROPYL FORMATES**	3	II		P5	**A7.2.**
	UN2482	**N-PROPYL ISOCYANATE**	6.1	I	3	P1, 1	**A10.6.**
	UN1865	**N-PROPYL NITRATE**	3	II		P5	**A7.2.**
	UN1816	**PROPYLTRICHLOROSILANE**	8	II	3	P5, A7, N34	**A12.2.**
	UN3350	**PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC** *(flashpoint less than 23 degrees C)*	3	I II	6.1 6.1	P3 P4	**A7.2.** **A7.2.**
	UN3352	**PYRETHROID PESTICIDE, LIQUID, TOXIC**	6.1	I II III		P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
	UN3351	**PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE** *(flashpoint not less than 23 degrees C)*	6.1	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
	UN3349	**PYRETHROID PESTICIDE, SOLID, TOXIC**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
	UN1282	**PYRIDINE**	3	II		P4	**A7.2.**
		Pyridine perchlorate					FORBIDDEN
*	UN2845	**PYROPHORIC LIQUIDS, ORGANIC, N.O.S.**	4.2	I		P3	**A8.5.**
*	UN3194	**PYROPHORIC LIQUIDS, INORGANIC, N.O.S.**	4.2	I		P3	**A8.5.**
*	UN1383	**PYROPHORIC METALS, N.O.S.,** *or* **PYROPHORIC ALLOYS, N.O.S.**	4.2	I		P3	**A8.11.**
*	UN2846	**PYROPHORIC SOLIDS, ORGANIC, N.O.S.**	4.2	I		P3	**A8.11.**
*	UN3200	**PYROPHORIC SOLIDS, INORGANIC, N.O.S.**	4.2	I		P3	**A8.11.**
	UN1817	**PYROSULFURYL CHLORIDE**	8	II		P5	**A12.2.**
	UN1922	**PYRROLIDINE**	3	II	8	P5	**A7.2.**
		Quebrachitol pentanitrate					FORBIDDEN
		Quicklime; see **CALCIUM OXIDE**					
	UN2656	**QUINOLINE**	6.1	III		P5	**A10.4.**

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	UN2909	**RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES MANUFACTURED FROM DEPLETED URANIUM**	7			A507	**A11.5.**
	UN2909	**RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES MANUFACTURED FROM NATURAL THORIUM**	7			A507	**A11.5.**
	UN2909	**RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES MANUFACTURED FROM NATURAL URANIUM**	7			A507	**A11.5.**
	UN2908	**RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-EMPTY PACKAGING**	7			A507	**A11.5.**
	UN2911	**RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-INSTRUMENTS**	7			A507	**A11.5.**
	UN2911	**RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES**	7			A507	**A11.5.**
	UN2910	**RADIOACTIVE MATERIAL, EXCEPTED PACKAGE- LIMITED QUANTITY OF MATERIAL**	7			P5	**A11.5.**
	UN2912	**RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I)** *non-fissile or fissile-excepted*	7			A56, A507	**A11.6.**
	UN3321	**RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II)** *non-fissile or fissile-excepted*	7			A56, A507	**A11.6.**
	UN3324	**RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II) FISSILE**	7			A56, A507	**A11.6.**, **A11.10.**
	UN3322	**RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III)** *non-fissile or fissile-excepted*	7			A56, A507	**A11.6.**
	UN3325	**RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III) FISSILE**	7			A56, A507	**A11.6.**, **A11.10.**
	UN2913	**RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I)** *non-fissile or fissile-excepted*	7			A56, A507	**A11.6.**
	UN2913	**RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-II)** *non-fissile or fissile-excepted*	7			A56, A507	**A11.6.**
	UN3326	**RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I),FISSILE**	7			A56, A507	**A11.6.**
	UN3326	**RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-II), FISSILE**	7			A56, A507	**A11.6.**
	UN2919	**RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT** *non-fissile or fissile-excepted*	7			139, A56, A507	**A11.11.**
	UN3331	**RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE**	7			139, A56, A507	**A11.11.**
	UN3327	**RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE** *non-special form*	7			A56, A507	**A11.10.**
	UN2915	**RADIOACTIVE MATERIAL, TYPE A PACKAGE** *non-special form, non-fissile or fissile-excepted*	7			A56, A507	**A11.8.** , **A11.12.**
	UN3332	**RADIOACTIVE MATERIAL,TYPE A PACKAGE, SPECIAL FORM** *non-fissile or fissile-excepted*	7			A56, A507	**A11.8.**

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	UN3333	**RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE**	7			A56, A507	**A11.10.**
	UN3329	**RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE**	7			A56, A507	**A11.10.**
	UN2917	**RADIOACTIVE MATERIAL,TYPE B(M) PACKAGE** *non-fissile or fissile-excepted*	7			A56, A507	**A11.9.**
	UN3328	**RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE**	7			A56, A507	**A11.10.**
	UN2916	**RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE** *non-fissile or fissile-excepted*	7			A56, A507	**A11.9.**
	UN2978	**RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE** *non-fissile or fissile-excepted*	7			A56, A507	**A11.7.**
	UN2977	**RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE**	7			A507	**A11.7.**, **A11.10.**
	UN1856	**RAGS, OILY**	4.2	III			FORBIDDEN
		Railway torpedo, see **SIGNALS, RAILWAY TRACK, EXPLOSIVE**					
	UN0391	**RDX AND CYCLOTETRAMETHYLENETETRAMINE MIXTURE, WETTED** ***with not less than 15% water by mass***	1.1D			P4	**A5.7.**
	UN0391	**RDX AND CYCLOTETRAMETHYLENETETRAMINE MIXTURE, DESENSITIZED** *with not less than 10% phlegmatizer by mass*	1.1D			P4	**A5.7.**
	UN0483	**RDX, DESENSITIZED**	1.1D			P4	**A5.7.**
	UN0072	**RDX, WETTED** *with not less than 15% water by mass*	1.1D			P4	**A5.7.**
	UN2037	**RECEPTACLES, SMALL, CONTAINING GAS (gas cartridges)** *nonflammable, without release device, not refillable(and not exceeding 1L capacity)*	2.2			P5	**A6.3.**, **A6.4.**
	UN2037	**RECEPTACLES, SMALL, CONTAINING GAS (gas cartridges)** *flammable without release device, not refillable(and not exceeding 1L capacity*)	2.1			P5	**A6.3.**, **A6.4.**
	UN2037	**RECEPTACLES, SMALL, CONTAINING GAS (*oxidizing)g without a release device, non -refillable***	2.2		5.1	P5	**A6.3.**, **A6.4.**
	UN2037	**RECEPTACLES, SMALL, CONTAINING GAS *(toxic) without a release device, non-refillable***	2.3				FORBIDDEN
	UN2037	**RECEPTACLES, SMALL, CONTAINING GAS *(toxic and corrosive) without a release device, non-refillable***	2.3		8		FORBIDDEN
	UN2037	**RECEPTACLES, SMALL, CONTAINING GAS *(toxic and flammable) without a release device, non-refillable***	2.3		2.1		FORBIDDEN
	UN2037	**RECEPTACLES, SMALL, CONTAINING GAS *(toxic and oxidizing) without a release device, non-refillable***	2.3		5.1		FORBIDDEN
	UN2037	**RECEPTACLES, SMALL, CONTAINING GAS *(toxic, flammable, corrosive) without a release device, non-refillable***	2.3		2.1, 8		FORBIDDEN

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN2037	**RECEPTACLES, SMALL, CONTAINING GAS (toxic, oxidizing and corrosive) without a release device, non-refillable**	2.3		5.1, 8		FORBIDDEN
		Red Phosphorus, see **PHOSPHORUS, AMORPHUS**					
	UN1078	**REFRIGERANT GAS, N.O.S.**	2.2			P5	**A6.3., A6.4.**
	UN1028	**REFRIGERANT GAS R12** *or* **DICHLORODIFLUOROMETHANE**	2.2			P5	**A6.3., A6.4.**
	UN1974	**REFRIGERANT GAS R12B1** *or* **CHLORODIFLUOROBROMO-METHANE**	2.2			P5	**A6.3., A6.4.**
	UN1022	**REFRIGERANT GAS R13** *or* **CHLOROTRIFLUOROMETHANE**	2.2			P5	**A6.3., A6.4.**
	UN1009	**REFRIGERANT GAS R13B1** *or* **BROMOTRIFLUOROMETHANE**	2.2			P5	**A6.3., A6.4.**
	UN1982	**REFRIGERANT GAS R14** *or* **TETRAFLUOROMETHANE**	2.2			P5	**A6.5.**
	UN1029	**REFRIGERANT GAS R21** *or* **DICHLOROFLUOROMETHANE**	2.2			P5	**A6.3., A6.4.**
	UN1018	**REFRIGERANT GAS R22** *or* **CHLORODIFLUOROMETHANE**	2.2			P5	**A6.3., A6.4.**
	UN1984	**REFRIGERANT GAS R23** *or* **TRIFLUOROMETHANE**	2.2			P5	**A6.3., A6.4.**
	UN3252	**REFRIGERANT GAS R32** *or* **DIFLUOROMETHANE**	2.1			P4	**A6.3., A6.5.**
	UN1063	**REFRIGERANT GAS R40** *or* **METHYL CHLORIDE**	2.1			P4	**A6.3., A6.4.**
	UN2454	**REFRIGERANT GAS R41** *or* **METHYL FLUORIDE**	2.1			P4	**A6.3., A6.4.**
	UN1958	**REFRIGERANT GAS R114** *or* **DICHLOROTETRAFLUOROETHANE**	2.2			P5	**A6.3., A6.4.**
	UN1020	**REFRIGERANT GAS R115** *or* **CHLOROPENTAFLUOROETHANE**	2.2			P5	**A6.3., A6.4.**
	UN2193	**REFRIGERANT GAS R116** *or* **HEXAFLUOROETHANE**	2.2			P5	**A6.3., A6.4.**
	UN1021	**REFRIGERANT GAS R124** or **CHLOROTETRAFLUOROETHANE**	2.2			P5	**A6.3., A6.4.**
	UN3220	**REFRIGERANT GAS R125** *or* **PENTAFLUOROETHANE**	2.2			P5	**A6.3., A6.4.**
	UN1983	**REFRIGERANT GAS R133A** *or* **CHLOROTRIFLUOROETHANE**	2.2			P5	**A6.3., A6.4.**
	UN3159	**REFRIGERANT GAS R134A** *or* **1,1,1,2-TETRAFLUOROETHANE**	2.2			P5	**A6.3., A6.4.**
	UN2517	**REFRIGERANT GAS 142B** *or* **1-CHLORO-1,1-DIFLUOROETHANE**	2.1			P4	**A6.3., A6.4.**
	UN2035	**REFRIGERANT GAS 143A** *or* **1,1,1-TRIFLUOROETHANE**	2.1			P4	**A6.3., A6.4.**
	UN1030	**REFRIGERANT GAS 152A** *or* **DIFLUOROETHANE**	2.1			P4	**A6.3., A6.4.**

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	UN2453	**REFRIGERANT GAS 161** *or* **ETHYL FLUORIDE**	2.1			P4	**A6.3., A6.4.**
	UN2424	**REFRIGERANT GAS 218** *or* **OCTAFLUOROPROPANE**	2.2			P5	**A6.4.**
	UN3296	**REFRIGERANT GAS 227** *or* **HEPTAFLUOROPROPANE**	2.2			P5	**A6.3., A6.4.**
	UN3337	**REFRIGERANT GAS R404A**	2.2			P5	**A6.3., A6.4.**
	UN3338	**REFRIGERANT GAS R407A**	2.2			P5	**A6.3., A6.4.**
	UN3339	**REFRIGERANT GAS R407B**	2.2			P5	**A6.3., A6.4.**
	UN3340	**REFRIGERANT GAS R407C**	2.2			P5	**A6.3., A6.4.**
	UN2602	**REFRIGERANT GAS R500** *or* **DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE**	2.2			P5	**A6.3., A6.4.**
	UN1973	**REFRIGERANT GAS R502** *or* **CHLOROPENTAFLUOROETHANE MIXTURE**	2.2			P5	**A6.3., A6.4.**
	UN2599	**REFRIGERANT GAS R503** *or* **CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE**	2.2			P5	**A6.3., A6.4.**
	UN1959	**REFRIGERANT GAS R1132A** *or* **1,1-DIFLUOROETHYLENE**	2.1			P4	**A6.3., A6.4.**
	UN1858	**REFRIGERANT GAS R1216** *or* **HEXAFLUOROPROPYLENE**	2.2			P5	**A6.3., A6.4.**
	UN2422	**REFRIGERANT GAS R1318** *or* **OCTAFLUOROBUT-2-ENE**	2.2			P5	**A6.4.**
	UN1976	**REFRIGERANT GAS RC318** *or* **OCTAFLUOROCYCLOBUTANE**	2.2			P5	**A6.4.**
*	UN1078	**REFRIGERANT GASES, N.O.S.**	2.2			P5	**A6.3., A6.4.**
D	NA1954	**REFRIGERANT GASES, N.O.S.** *or* **DISPERSANT GASES, N.O.S.**	2.1			P4	**A6.3., A6.4.**
	UN3358	**REFRIGERATING MACHINES**	2.1				FORBIDDEN
D	NA1954	**REFRIGERATING MACHINES,** *containing flammable nonpoisonous, liquefied gas*	2.1			P4	**A6.3., A6.8.**
	UN2857	**REFRIGERATING MACHINES,** *containing nonflammable non-toxic, liquefied gas or ammonia solutions*	2.2			P5	**A6.3., A6.8.**
		Refrigerating machines containing toxic liquefied gas or ammonia solution with more than 50% ammonia					FORBIDDEN
	UN3291	**REGULATED MEDICAL WASTE**	6.2	II		P5	**A10.10.**
	UN0173	**RELEASE DEVICES, EXPLOSIVE**	1.4S			P5, A69	**A5.18.**
	UN1866	**RESIN SOLUTION,** *flammable*	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
	UN2876	**RESORCINOL**	6.1	III		P5	**A10.5.**
		Rifle grenade, see **GRENADES,** *hand or rifle, etc.*					
		Rifle powder, see **POWDER, SMOKELESS**					

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN0174	**RIVETS, EXPLOSIVE**	1.4S			P5, A69	**A5.18.**
	UN0186	**ROCKET MOTORS**	1.3C			P4, 109	**A5.13.**
	UN0280	**ROCKET MOTORS**	1.1C			P4, 109	**A5.13.**
	UN0281	**ROCKET MOTORS**	1.2C			P4, 109	**A5.13.**
	UN0395	**ROCKET MOTORS, LIQUID FUELED**	1.2J			P2, 109	**A5.4.**
	UN0396	**ROCKET MOTORS, LIQUID FUELED**	1.3J			P2, 109	**A5.4.**
	UN0250	**ROCKET MOTORS WITH HYPERGOLIC LIQUIDS** *with or without an expelling charge*	1.3L			P2, 109	**A5.4.**
	UN0322	**ROCKET MOTORS WITH HYPERGOLIC LIQUIDS** *with or without an expelling charge*	1.2L			P2, 109	**A5.4.**
	UN0453	**ROCKETS, LINE-THROWING**	1.4G			P5	**A5.13.**
	UN0238	**ROCKETS, LINE-THROWING**	1.2G			P4	**A5.13.**
	UN0240	**ROCKETS, LINE-THROWING**	1.3G			P4	**A5.13.**
	UN0398	**ROCKETS, LIQUID FUELED** *with bursting charge*	1.2J			P2, A500	**A5.4.**
	UN0397	**ROCKETS, LIQUID FUELED** *with bursting charge*	1.1J			P2, A500	**A5.4.**
	UN0180	**ROCKETS,** *with bursting charge*	1.1F			P4	**A5.13.**
	UN0181	**ROCKETS**, *with bursting charge*	1.1E			P4	**A5.13.**
	UN0182	**ROCKETS,** *with bursting charge*	1.2E			P4	**A5.13.**
	UN0295	**ROCKETS,** *with bursting charge*	1.2F			P4	**A5.13.**
	UN0436	**ROCKETS,** *with expelling charge*	1.2C			P4	**A5.13.**
	UN0437	**ROCKETS,** *with expelling charge*	1.3C			P4	**A5.13.**
	UN0438	**ROCKETS,** *with expelling charge*	1.4C			P5	**A5.13.**
	UN0183	**ROCKETS,** *with inert head*	1.3C			P4	**A5.13.**
	UN0502	**ROCKETS,** *with inert head*	1.2C			P4	**A5.13.**
	UN1286	**ROSIN OIL**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN1345	**RUBBER SCRAP** *or* **RUBBER SHODDY**, *powdered or granulated, not exceeding 840 microns & rubber Content exceeding 45%*	4.1	II		P5	**A8.3.**
	UN1287	**RUBBER SOLUTION**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN1423	**RUBIDIUM**	4.3	I		P3, 22, A7, A19, N34, N40, N45	**A8.3.**
	UN2678	**RUBIDIUM HYDROXIDE**	8	II		P5	**A12.3.**
	UN2677	**RUBIDIUM HYDROXIDE SOLUTION**	8	II III		P5 P5	**A12.2.** **A12.2.**
		Safety fuse, see **FUSE, SAFETY**					
*	UN0190	**SAMPLES, EXPLOSIVE**, *other than initiating explosives*	use class/ division of sample	II		P4, 113	**A5.4.**
	UN0503	**SEAT-BELT PRETENSIONERS**	1.4G	II		P5	**A5.19.**
	UN3268	**SEAT-BELT PRETENSIONERS**	9	III		P5	**A13.15.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
		Security type attaché cases, cash boxes/bags, incorporating dangerous goods such as lithium batteries and/or pyrotechnic material					FORBIDDEN
	UN1386	**SEED CAKE,** *containing vegetable oil solvent extractions and expelled seeds, with not more than 10% of oil and when the amount of moisture is higher than 11%, not more than 20% of oil and moisture combined*	4.2	III		P5, N7	**A8.3.**
	UN1386	**SEED CAKE** *with more than 1.5% oil and not more than 11% moisture*	4.2	III		P5, N7	**A8.3.**
	UN2217	**SEED CAKE** *with not more than 1.5% oil and not more than 11% moisture*	4.2	III		P5, N7	**A8.3.**
	UN2630	**SELENATES** *or* **SELENITES**	6.1	I		P5	**A10.5.**
	UN1905	**SELENIC ACID**	8	I		P3, N34	**A12.3.**
	UN3440	**SELENIUM COMPOUND, LIQUID, N.O.S.**	6.1	I II III		P5 P5 P5	**A10.4.** **A10.4.** **A10.4.**
	UN3283	**SELENIUM COMPOUND, SOLID, N.O.S.**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
	UN2657	**SELENIUM DISULPHIDE**	6.1	II		P5	**A10.5.**
	UN2194	**SELENIUM HEXAFLUORIDE**	2.3		8	P1, 1	**A6.5.**
		Selenium nitride					FORBIDDEN
	UN2879	**SELENIUM OXYCHLORIDE**	8	I	6.1	P3, A3, A6, A7, N34	**A12.2.**
+, D	NA3334	**SELF-DEFENSE SPRAY, NON-PRESSURIZED**	9			P5, A37	**A13.2.**
*	UN3188	**SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.**	4.2	II III	8 8	P4 P5	**A8.2.** **A8.2.**
*	UN3185	**SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.**	4.2	II III	8 8	P4 P5	**A8.2.** **A8.2.**
*	UN3186	**SELF-HEATING LIQUID, INORGANIC, N.O.S.**	4.2	II III		P4 P5	**A8.2.** **A8.2.**
*	UN3183	**SELF-HEATING LIQUID, ORGANIC, N.O.S.**	4.2	II III		P4 P5	**A8.2.** **A8.2.**
*	UN3187	**SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.**	4.2	II III	6.1 6.1	P4 P5	**A8.2.** **A8.2.**
*	UN3184	**SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.**	4.2	II III	6.1 6.1	P4 P5	**A8.2.** **A8.2.**
*	UN3192	**SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.**	4.2	II III	8 8	P5 P5	**A8.3.** **A8.3.**
*	UN3126	**SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.**	4.2	II III	8 8	P5 P5	**A8.3.** **A8.3.**
*	UN3190	**SELF-HEATING SOLID, INORGANIC, N.O.S.**	4.2	II III		P5 P5	**A8.3.** **A8.3.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
*	UN3088	**SELF-HEATING SOLID, ORGANIC, N.O.S.**	4.2	II III		P5 P5	**A8.3.** **A8.3.**
*	UN3127	**SELF-HEATING SOLID, OXIDIZING, N.O.S.**	4.2		5.1	P3	**A8.4.**
*	UN3191	**SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.**	4.2	II III	6.1 6.1	P5 P5	**A8.3.** **A8.3.**
*	UN3128	**SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.**	4.2	II III	6.1 6.1	P5 P5	**A8.3.** **A8.3.**
*	UN3221	**SELF-REACTIVE LIQUID TYPE B**	4.1				FORBIDDEN
*	UN3223	**SELF-REACTIVE LIQUID TYPE C** *(specific technical name required)*	4.1	II		P5	**A8.7.**
*	UN3225	**SELF-REACTIVE LIQUID TYPE D** *(specific technical name required)*	4.1	II		P5	**A8.7.**
*	UN3227	**SELF-REACTIVE LIQUID TYPE E** *(specific technical name required)*	4.1	II		P5	**A8.7.**
*	UN3229	**SELF-REACTIVE LIQUID TYPE F** *(specific technical name required)*	4.1	II		P5	**A8.7.**
		Self-reactive solid type B					FORBIDDEN
		Self-reactive solid type B temperature controlled					FORBIDDEN
*	UN3231	**SELF-REACTIVE LIQUID TYPE B, TEMPERATURE CONTROLLED** *(specific technical name required)*	4.1				FORBIDDEN
*	UN3233	**SELF-REACTIVE LIQUID TYPE C TEMPERATURE CONTROLLED** *(specific technical name required)*	4.1				FORBIDDEN
*	UN3235	**SELF-REACTIVE LIQUID TYPE D, TEMPERATURE CONTROLLED** *(specific technical name required)*	4.1				FORBIDDEN
*	UN3237	**SELF-REACTIVE LIQUID TYPE E, TEMPERATURE CONTROLLED** *(specific technical name required)*	4.1				FORBIDDEN
*	UN3239	**SELF-REACTIVE LIQUID TYPE F, TEMPERATURE CONTROLLED** *(specific technical name required)*	4.1				FORBIDDEN
*	UN3222	**SELF-REACTIVE SOLID TYPE B***(see below for specific technical name)*	4.1	II		P5, 53	(see technical name below for packaging para-graph reference)
		2-diazo-1-naphthol-4-sulphochloride					**A8.9.**
		2-diazo-1-naphthol-5-sulphochloride					**A8.9.**
*	UN3224	**SELF-REACTIVE SOLID TYPE C** *(see below for specific technical name)*	4.1	II		P5	(see technical name below for packaging para-graph reference)
		n,n'-dinitroso-n,n'-dimethyl terephthalamide, as a paste					**A8.6.**
		n,n'-dinitrosopentamethylenetetramine					**A8.7.**
*	UN3226	**SELF-REACTIVE SOLID TYPE D** *(see below for specific technical name)*	4.1	II		P5	(see technical name below for packaging para- graph reference)
		1,1'-azodi-(hexahydrobenzonitrile)					**A8.7.**

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		benzene-1,3-disulphohydrazide as a paste					**A8.7.**
		benzene sulphohydrazide					**A8.7.**
		4-(benzyl(ethyl)amino)- 3-ethoxybenzenediazonium zinc chloride					FORBIDDEN
		3-chloro-4-diethylamino-benzenediazonium zinc chloride					**A8.8.**
		diphenyloxide-4,4'-disulphohydrazide					**A8.6.**
		4-dipropylaminobenzenediazonium zinc chloride 4-methylbenzene sulphonylhydrazide					**A8.8.**
		sodium 2-diazo-1-naphthol-4-sulphonate					**A8.8.**
		sodium 2-diazo-1-naphthol-5-sulphonate					**A8.8.**
*	UN3228	**SELF-REACTIVE SOLID TYPE E,** *(specific technical name required)*	4.1	II		P5	**A8.8.**
*	UN3230	**SELF-REACTIVE SOLID TYPE F,** *(specific technical name required)*	4.1	II		P5	**A8.8.**
*	UN3232	**SELF-REACTIVE SOLID TYPE B, TEMPERATURE CONTROLLED**	4.1	II			FORBIDDEN
*	UN3234	**SELF-REACTIVE SOLID TYPE C**, **TEMPERATURE CONTROLLED***(specific technical name required)*	4.1				FORBIDDEN
*	UN3236	**SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED** *(specific technical name required)*	4.1				FORBIDDEN
*	UN3238	**SELF-REACTIVE SOLID TYPE E, TEMPERATURE CONTROLLED** (*specific technical name required)*	4.1				FORBIDDEN
*	UN3240	**SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED** *(specific technical name required)*	4.1				FORBIDDEN
	UN1288	**SHALE OIL**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
		Shaped Charges, commercial, see **CHARGES, SHAPED, COMMERCIAL**, *etc*					
	UN0191	**SIGNAL DEVICES, HAND**	1.4G			P5, A69	**A5.19.**
	UN0373	**SIGNAL DEVICES, HAND**	1.4S			P5, A69	**A5.19.**
	UN0194	**SIGNALS, DISTRESS**, *ship*	1.1G			P4, A69	**A5.19.**
	UN0195	**SIGNALS, DISTRESS,** *ship*	1.3G			P4, A69	**A5.19.**
		Signals, highway, see **SIGNAL DEVICES, HAND; FIREWORKS TYPE D**					
	UN0192	**SIGNALS, RAILWAY TRACK, EXPLOSIVE**	1.1G			P4, A69	**A5.19.**
	UN0492	**SIGNALS, RAILWAY TRACK, EXPLOSIVE**	1.3G			P4, A69	**A5.19.**
	UN0493	**SIGNALS, RAILWAY TRACK, EXPLOSIVE**	1.4G			P5, A69	**A5.19.**
	UN0193	**SIGNALS, RAILWAY TRACK, EXPLOSIVE**	1.4S			P5, A69	**A5.19.**
		Signals, ship distress, water-activated; see **CONTRIVANCES, WATER-ACTIVATED**, *etc*					
	UN0196	**SIGNALS, SMOKE**	1.1G			P4	**A5.19.**
	UN0313	**SIGNALS, SMOKE**	1.2G			P4	**A5.19.**

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	UN0197	**SIGNALS, SMOKE**	1.4G			P5	**A5.19.**
	UN0487	**SIGNALS, SMOKE**	1.3G			P4	**A5.19.**
	UN2203	**SILANE**	2.1			P4	**A6.5.**
		***Silicofluoric acid, see* FLUOROSILICIC ACID**					
		***Silicon chloride, see* SILICON TETRACHLORIDE**					
	UN1346	**SILICON POWDER, AMORPHOUS**	4.1	III		P5, A1	**A8.3.**
	UN1818	**SILICON TETRACHLORIDE**	8	II		P5, A3, A6	**A12.2.**
	UN1859	**SILICON TETRAFLUORIDE**	2.3		8	P2, 2	**A6.6.**
		Silver acetylide (dry)					FORBIDDEN
	UN1683	**SILVER ARSENITE**	6.1	II		P5	**A10.5.**
		Silver azide (dry)					FORBIDDEN
		Silver chlorite (dry)					FORBIDDEN
	UN1684	**SILVER CYANIDE**	6.1	II		P5	**A10.5.**
		Silver fulminate (dry)					FORBIDDEN
	UN1493	**SILVER NITRATE**	5.1	II		P5	**A9.6.**
		Silver oxadate (dry)					FORBIDDEN
		Silver picrate (dry)					FORBIDDEN
	UN1347	**SILVER PICRATE, WETTED**, *with not less than 30% water, by mass*	4.1	I		P3	**A8.3.**
		Silver picrate, wetted with no more than 30% water, by weight					FORBIDDEN
	UN1906	**SLUDGE, ACID**	8	II		P5, A3, A7, N34	**A12.2.**
D	NA3178	**SMOKELESS POWDER FOR SMALL ARMS** *(100 pounds or less)*	4.1	I		P4	**A8.17.**
	UN1907	**SODA LIME** *with more than 4% sodium hydroxide*	8	III		P5	**A12.3.**
	UN1428	**SODIUM**	4.3	I		P3, A7, A8, A19, A20, N34	**A8.3.**
	UN2812	**SODIUM ALUMINATE, SOLID**	8	III		P5	**A12.3.**
	UN1819	**SODIUM ALUMINATE, SOLUTION**	8	II III		P5 P5	**A12.2.** **A12.2.**
	UN2835	**SODIUM ALUMINUM HYDRIDE**	4.3	II		P5, A8, A19, A20	**A8.3.**
	UN2863	**SODIUM AMMONIUM VANADATE**	6.1	II		P5	**A10.5.**
	UN2473	**SODIUM ARSANILATE**	6.1	III		P5	**A10.5.**
	UN1685	**SODIUM ARSENATE**	6.1	II		P5	**A10.5.**
	UN1686	**SODIUM ARSENITE, AQUEOUS SOLUTIONS**	6.1	II III		P5 P5	**A10.4.** **A10.4.**
	UN2027	**SODIUM ARSENITE, SOLID**	6.1	II		P5	**A10.5.**
	UN1687	**SODIUM AZIDE**	6.1	II		P5	**A10.5.**
		Sodium bifluoride, see **SODIUM HYDROGENFLUORIDE**					
		Sodium bisulfite, solution, ***see* BISULFITES, AQUEOUS SOLUTIONS N.O.S**					

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	UN3320	**SODIUM BOROHYDRIDE and SODIUM HYDROXIDE SOLUTION** *with no more than 12% sodium borohydride and not more than 40% sodium hydroxide by mass*	8	II III		P5, N34 P5, N34	**A12.2.** **A12.2.**
	UN1426	**SODIUM BOROHYDRIDE**	4.3	I		P3, N40	**A8.3.**
	UN1494	**SODIUM BROMATE**	5.1	II		P5	**A9.6.**
	UN1688	**SODIUM CACODYLATE**	6.1	II		P5	**A10.5.**
	UN3378	**SODIUM CARBONATE PEROXYHYDRATE**	5.1	II III		P5 P5	**A9.6.** **A9.6.**
	UN1495	**SODIUM CHLORATE**	5.1	II		P5, A9, N34	**A9.6.**
	UN2428	**SODIUM CHLORATE, AQUEOUS SOLUTION**	5.1	II III		P5, A2 P5, A2	**A9.5.** **A9.5.**
		Sodium chlorate mixed with dinitrotoluene, see **EXPLOSIVE BLASTING TYPE C**					
	UN1496	**SODIUM CHLORITE**	5.1	II		P5, A9, N34	**A9.6.**
	UN2659	**SODIUM CHLOROACETATE**	6.1	III		P5	**A10.5.**
	UN2316	**SODIUM CUPROCYANIDE, SOLID**	6.1	I		P5	**A10.5.**
	UN2317	**SODIUM CUPROCYANIDE, SOLUTION**	6.1	I		P3	**A10.4.**
	UN1689	**SODIUM CYANIDE**, **SOLID**	6.1	I		P5, N74, N75	**A10.5.**
	UN3414	**SODIUM CYANIDE**, **SOLUTION**	6.1	I II III		P5 P5 P5	**A10.4.** **A10.4.** **A10.4.**
		Sodium dichloroisocyanurate or Sodium dichloro-s-triazine-trione, see **DICHLOROISOCYANURIC ACID, *etc.***					
	UN0234	**SODIUM DINITRO-O-CRESOLATE,** *dry or wetted, with less than 15% water, by mass*	1.3C			P4	**A5.10.**
	UN1348	**SODIUM DINITRO-O-CRESOLATE, WETTED,** *with not less than 15% water, by mass*	4.1	I	6.1	P4, 23, A8, A19, A20,N41	**A8.3.**
	UN3369	**SODIUM DINITRO-O-CRESOLATE, WETTED**, *with more than 10% but less than 15% water, by weight*	4.1	I		P4, 23, A8, A19, A20,N41	**A8.3.**
	UN1384	**SODIUM DITHIONITE** *or* **SODIUM HYDROSULFITE**	4.2	II		P5, A19, A20	**A8.3.**
	UN1690	**SODIUM FLUORIDE, SOLID**	6.1	III		P5	**A10.5.**
	UN3415	**SODIUM FLUORIDE, SOLUTION**	6.1	III		P5	**A10.4.**
	UN2629	**SODIUM FLUOROACETATE**	6.1	I		P5	**A10.5.**
	UN2674	**SODIUM FLUOROSILICATE**	6.1	III		P5	**A10.5.**
		Sodium hydrate, see **SODIUM HYDROXIDE, SOLID**					
	UN1427	**SODIUM HYDRIDE**	4.3	I		P3, A19, N40	**A8.3.**
	UN2439	**SODIUM HYDROGENDIFLUORIDE,** *solid or solution*	8	II		P5, N3, N34	**A12.2.**, **A12.3.**
	UN2318	**SODIUM HYDROSULPHIDE**, *with less than 25% water of crystallization*	4. 2	II		P5, A7, A19, A20	**A8.3.**
	UN2949	**SODIUM HYDROSULPHIDE**, *with not less than 25% water of crystallization*	8	II		P5, A7	**A12.3.**

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		SODIUM HYDROSULFITE; *see* **SODIUM DITHIONITE**					
	UN1823	**SODIUM HYDROXIDE, SOLID**	8	II		P5	**A12.3.**
	UN1824	**SODIUM HYDROXIDE, SOLUTION**	8	II		P5, N34	**A12.2.**
				III		P5, N34	**A12.2.**
		Sodium hypochlorite, solution, see* HYPOCHLORITE SOLUTIONS, *etc.					
		Sodium metal, liquid alloy, see **ALKALI METAL ALLOYS, N.O.S.**					
	UN1431	**SODIUM METHYLATE**	4.2	II	8	P5, A19	**A8.3.**
	UN1289	**SODIUM METHYLATE SOLUTIONS** *in alcohol*	3	II	8	P5	**A7.2.**
				III	8	P5	**A7.2.**
	UN1825	**SODIUM MONOXIDE**	8	II		P5	**A12.3.**
	UN1498	**SODIUM NITRATE**	5.1	III		P5, A1, A29	**A9.6.**
	UN1499	**SODIUM NITRATE AND POTASSIUM NITRATE MIXTURES**	5.1	III		P5, A1, A29	**A9.6.**
	UN1500	**SODIUM NITRITE**	5.1	III	6.1	P5, A1, A29	**A9.6.**
	UN2567	**SODIUM PENTACHLOROPHENATE**	6.1	II		P5	**A10.5.**
	UN3377	**SODIUM PERBORATE MONOHYDRATE**	5.1	III		P5, 27, A1, A29	**A9.6.**
	UN1502	**SODIUM PERCHLORATE**	5.1	II		P5	**A9.6.**
	UN1503	**SODIUM PERMANGANATE**	5.1	II		P5	**A9.6.**
	UN1504	**SODIUM PEROXIDE**	5.1	I		P3, A20, N34	**A9.6.**
	UN3247	**SODIUM PEROXOBORATE, ANHYDROUS**	5.1	II		P5	**A9.6.**
	UN1505	**SODIUM PERSULPHATE**	5.1	III		P5, A1	**A9.6.**
	UN1432	**SODIUM PHOSPHIDE**	4.3	I	6.1	P3, A19, N40	**A8.3.**
	UN0235	**SODIUM PICRAMATE**, *dry or wetted, with less than 20% water, by mass*	1.3C			P3	**A5.10.**
	UN1349	**SODIUM PICRAMATE, WETTED**, *with not less than 20% water, by mass*	4.1	I		P4, 23, A8, A19, N41	**A8.3.**
		Sodium picryl peroxide					FORBIDDEN
		Sodium selenate; see **SELENATES** *or* **SELENITES**					
	UN1385	**SODIUM SULPHIDE, ANHYDROUS** *or* **SODIUM SULPHIDE** *with less than 30% water of crystallization*	4.2	II		P5, A19, A20, N34	**A8.3.**
	UN1849	**SODIUM SULPHIDE, HYDRATED** *with at least 30% water*	8	II		P5	**A12.3.**
	UN2547	**SODIUM SUPEROXIDE**	5.1	I		P5, A20, N34	**A9.6.**
		Sodium tetranitride					FORBIDDEN
*	UN3244	**SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.**	8	II		P5, 49	**A12.3.**
*	UN3175	**SOLIDS CONTAINING FLAMMABLE LIQUID, N.O.S.**	4.1	II		P5, 47	**A8.3.**
*	UN3243	**SOLIDS CONTAINING TOXIC LIQUID, N.O.S.**	6.1	II		P5, 48	**A10.5.**
	UN0204	**SOUNDING DEVICES, EXPLOSIVE**	1.2F			P4	**A5.18.**
	UN0296	**SOUNDING DEVICES, EXPLOSIVE**	1.1F			P4	**A5.18.**
	UN0374	**SOUNDING DEVICES, EXPLOSIVE**	1.1D			P4	**A5.18.**

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		***Spirits of salts, see* HYDROCHLORIC ACID**					
		Squibs, see* IGNITERS, *etc.					
	UN0375	**SOUNDING DEVICES, EXPLOSIVE**	1.2D			P4	**A5.18.**
	UN1827	**STANNIC CHLORIDE, ANHYDROUS**	8	II		P5	**A12.2.**
	UN2440	**STANNIC CHLORIDE, PENTAHYDRATE**	8	III		P5	**A12.3.**
	UN1433	**STANNIC PHOSPHIDES**	4.3	I	6.1	P3, A19, N40	**A8.3.**
		Steel swarf, see* FERROUS METAL BORINGS, *etc.					
	UN2676	**STIBINE**	2.3		2.1	P1, 1	**A6.4.**
		Storage batteries, wet, see **BATTERIES,** *wet,etc.*					
	UN1691	**STRONTIUM ARSENITE**	6.1	II		P5	**A10.5.**
	UN1506	**STRONTIUM CHLORATE**	5.1	II		P5, A1, A9, N34	**A9.6.**
	UN1507	**STRONTIUM NITRATE**	5.1	III		P5, A1, A29	**A9.6.**
	UN1508	**STRONTIUM PERCHLORATE**	5.1	II		P5	**A9.6.**
	UN1509	**STRONTIUM PEROXIDE**	5.1	II		P5	**A9.6.**
	UN2013	**STRONTIUM PHOSPHIDE**	4.3	I	6.1	P3, A19, N40	**A8.3.**
	UN1692	**STRYCHNINE** *or* **STRYCHNINE SALTS**	6.1	I		P5	**A10.5.**
	UN0219	**STYPHNIC ACID** ***dry or wetted with no more than 20% water, or mixture of alcohol and water, by weight***	1.1D			P4	**A5.7.**
	UN0394	**STYPHNIC ACID, WETTED** ***with more than 20% water, or mixture of alcohol and water, by weight***	1.1D			P4	**A5.7.**
	UN2055	**STYRENE MONOMER, STABILIZED**	3	III		P5	**A7.2.**
*	UN0357	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.1L			P3	**A5.4.**
*	UN0358	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.2L			P3	**A5.4.**
*	UN0359	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.3L			P3	**A5.4.**
*	UN0473	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.1A			P3, 111	A54.
*	UN0474	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.1C			P4	**A5.4.**
*	UN0475	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.1D			P4	**A5.4.**
*	UN0476	**SUBSTANCES, EXPLOSIVE, N.O.S**.	1.1G			P4	**A5.4.**
*	UN0477	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.3C			P4	**A5.4.**
*	UN0478	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.3G			P4	**A5.4.**
*	UN0479	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.4C			P5	**A5.4.**
*	UN0480	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.4D			P5	**A5.4.**
*	UN0481	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.4S			P5, A69	**A5.4.**
*	UN0485	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.4G			P5	**A5.4.**
*	UN0482	**SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE, N.O.S.** *or* **SUBSTANCES EVI, N.O.S.**	1.5D			P5	**A5.4.**
*	UN2780	**SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, FLAMMABLE, TOXIC** *flashpoint less than 23 degrees C*	3	I II	6.1 6.1	P3 P4	**A7.2.** **A7.2.**
*	UN3014	**SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, TOXIC**	6.1	I II III		P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**

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*	UN3013	**SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, TOXIC, FLAMMABLE** *flashpoint not less than 23 degrees C*	6.1	I II III	3 3 3	P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN2779	**SUBSTITUTED NITROPHENOL PESTICIDES, SOLID, TOXIC**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
		Sucrose octanitrate (dry)					FORBIDDEN
	UN2967	**SULPHAMIC ACID**	8	III		P5	**A12.3.**
D	NA1350	**SULPHUR**	9	III		P5	**A13.2.**
	UN1350	**SULPHUR**	4.1	III		P5, 30	**A8.3.**
		Sulphur and chlorate, loose mixtures of					FORBIDDEN
	UN1828	**SULPHUR CHLORIDES**	8	I		P2, 5, A3, N34	**A12.2.**
		Sulphur dichloride, see **SULPHUR CHLORIDES**					
	UN1079	**SULPHUR DIOXIDE, LIQUEFIED**	2.3		8	P2, 3	**A6.4.**
		Sulphur dioxide solution, see **SULPHUROUS ACID**					
	UN1080	**SULPHUR HEXAFLUORIDE**	2.2			P5	**A6.3.**, **A6.4.**
D	NA2448	**SULFUR, MOLTEN**	9				FORBIDDEN
	UN1830	**SULPHURIC ACID** *with more than 51% acid*	8	II		P4, A3, A7, N34	**A12.2.**
	UN2796	**SULPHURIC ACID,** *not more than 51% acid*	8	II		P5, A3, A7 N6, N34	**A12.2.**
+	UN1831	**SULPHURIC ACID, FUMING** *with less than 30% free sulfur trioxide*	8	I		P3, A3, A7, N34	**A12.11.**
	UN1831	**SULPHURIC ACID, FUMING** *with 30% or more free sulfur trioxide*	8		6.1		FORBIDDEN
	UN1832	**SULPHURIC ACID, SPENT**	8	II		P4, A3, A7, N34	**A12.2.**
		Sulphuric anhydride, see **SULFUR TRIOXIDE, STABILIZED**					
	UN2448	**SULPHUR, MOLTEN**	4.1				FORBIDDEN
	UN1833	**SULPHUROUS ACID**	8	II		P5	**A12.2.**
	UN2418	**SULPHUR TETRAFLUORIDE**	2.3		8	P1, 1	**A6.5.**
+	UN1829	**SULPHUR TRIOXIDE, STABILIZED**	8	I	6.1	P2, 2, A7, N34	**A12.11.**
		***Sulfuretted hydrogen, see* HYDROGEN SULFIDE**					
+	UN1834	**SULPHURYL CHLORIDE**	8	I	6.1	P1, 1, A3, N34	**A12.11.**
	UN2191	**SULPHURYL FLUORIDE**	2.3			P2, 4	**A6.4.**
	UN1999	**TARS, LIQUID**, *including road asphalt and oils, bitumen and cut backs*	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN1700	**TEAR GAS CANDLES**	6.1	II	4.1	P4	**A10.7.**
		Tear gas cartridges, see **AMMUNITION, TEAR-PRODUCING,** *etc*					
D,*	NA1693	**TEAR GAS DEVICES**, *with more than 2% tear gas substance, by mass*	6.1	I II		P4 P4	**A10.7.** **A10.7.**
		Tear gas devices, with not more than 2 percent tear gas substances, by mass, see* AEROSOLS, *etc.					
		Tear gas grenades, see **TEAR GAS CANDLES**					

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*	UN1693	**TEAR GAS SUBSTANCES LIQUID, N.O.S.**	6.1	I		P3	**A10.4.**
				II		P5	**A10.4.**
*	UN3448	**TEAR GAS SUBSTANCES, SOLID, N.O.S.**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
	UN3284	**TELLURIUM COMPOUND, N.O.S.**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
	UN2195	**TELLURIUM HEXAFLUORIDE**	2.3		8	P1, 1	**A6.5.**
	UN2319	**TERPENE HYDROCARBONS, N.O.S.**	3	III		P5	**A7.2.**
	UN2541	**TERPINOLENE**	3	III		P5	**A7.2.**
		Tetraazido benzene quinone					FORBIDDEN
	UN2504	**TETRABROMOETHANE**	6.1	III		P5	**A10.4.**
	UN1702	**1,1,2,2-TETRACHLOROETHANE**	6.1	II		P5, N36	**A10.4.**
	UN1897	**TETRACHLOROETHYLENE**	6.1	III		P5, N36	**A10.4.**
		Tetraethylammonium perchlorate (dry)					FORBIDDEN
	UN1704	**TETRAETHYL DITHIOPYROPHOSPHATE**	6.1	II		P5	**A10.5.**
	UN2320	**TETRAETYLENEPENTAMINE**	8	III		P5	**A12.2.**
	UN1292	**TETRAETHYL SILICATE**	3	III		P5	**A7.2.**
	UN3159	**1,1,1,2-TETRAFLUOROETHANE** *or* **REFRIGERANT GAS R134A**	2.2			P5	**A6.3.**, **A6.4.**
	UN1081	**TETRAFLUOROETHYLENE, STABILIZED**	2.1			P4	**A6.3.**, **A6.4.**
	UN1982	**TETRAFLUOROMETHANE** *or* **REFRIGERANT GAS R14**	2.2			P5	**A6.5.**
	UN2498	**1,2,3,6-TETRAHYDROBENZALDEHYDE**	3	III		P5	**A7.2.**
	UN2056	**TETRAHYDROFURAN**	3	II		P5	**A7.2.**
	UN2943	**TETRAHYDROFURFURYLAMINE**	3	III		P5	**A7.2.**
	UN2698	**TETRAHYDROPHTHALIC ANHYDRIDES** *with more than 0.05% of maleic anhydride*	8	III		P5	**A12.3.**
	UN2410	**1,2,3,6-TETRAHYDROPYRIDINE**	3	II		P5	**A7.2.**
	UN2412	**TETRAHYDROTHIOPHENE**	3	II		P5	**A7.2.**
	UN3423	**TETRAMETHYLAMMONIUM HYDROXIDE, SOLID**	8	II		P5	**A12.3.**
	UN1835	**TETRAMETHYLAMMONIUM HYDROXIDE, SOLUTION**	8	II		P5	**A12.2.**
		Tetramethylene diperoxide dicarbamide					FORBIDDEN
	UN2749	**TETRAMETHYLSILANE**	3	I		P3	**A7.2.**
	UN0207	**TETRANITROANILINE**	1.1D			P4	**A5.8.**
		Tetranitro diglycerin					FORBIDDEN
+	UN1510	**TETRANITROMETHANE**	5.1		6.1		FORBIDDEN
		2,3,4,6-Tetranitrophenol					FORBIDDEN
		2,3,4,6-Tetranitrophenyl methyl nitramine					FORBIDDEN
		2,3,4,6-Tetranitrophenylnitramine					FORBIDDEN
		Tetranitroresorcinol (dry)					FORBIDDEN
		2,3,5,6-Tetranitroso-1,4-dinitrobenzene					FORBIDDEN

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		2,3,5,6-Tetranitroso nitrobenzene (dry)					FORBIDDEN
	UN2413	**TETRAPROPYLORTHOTITANATE**	3	III		P5	**A7.2.**
		TETRAZENE , *see* **GUANYL NITROSAMINOGUANYLTETRAZENE**					
		Tetrazine (dry)					FORBIDDEN
		Tetrazolyl azide (dry)					FORBIDDEN
	UN0407	**TETRAZOL-1-ACETIC ACID**	1.4C			P5	**A5.10.**
	UN0504	**1H-TETRAZOLE**	1.1D				FORBIDDEN
		TETRYL, *see* **TRINITROPHENYLMETHYL-NITRAMINE**	4.2	III			
	UN1857	**TEXTILE WASTE, WET**	4.2	III			FORBIDDEN
	UN2573	**THALLIUM CHLORATE**	5.1	II	6.1	P5	**A9.6.**
	UN1707	**THALLIUM COMPOUNDS, N.O.S.**	6.1	II		P5	**A10.5.**
	UN2727	**THALLIUM NITRATE**	6.1	II	5.1	P5	**A10.5.**
	UN2785	**4-THIAPENTANAL**	6.1	III		P5	**A10.4.**
	UN2436	**THIOACETIC ACID**	3	II		P5	**A7.2.**
*	UN2772	**THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	I II	6.1 6.1	P3 P5	**A7.2.** **A7.2.**
*	UN3006	**THIOCARBAMATE PESTICIDE, LIQUID, TOXIC**	6.1	I II III		P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN3005	**THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC,** *flashpoint not less than 23 degrees C*	6.1	I II III	3 3 3	P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN2771	**THIOCARBAMATE PESTICIDE, SOLID, TOXIC**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
		Thiocarbonylchloride, see **THIOPHOSGENE**					
	UN2966	**THIOGLYCOL**	6.1	II		P5	**A10.4.**
	UN1940	**THIOGLYCOLIC ACID**	8	II		P5, A7, N34	**A12.2.**
	UN2936	**THIOLACTIC ACID**	6.1	II		P5	**A10.5.**
	UN1836	**THIONYL CHLORIDE**	8	I		P3, A7, N34	**A12.2.**
	UN2414	**THIOPHENE**	3	II		P5	**A7.2.**
+	UN2474	**THIOPHOSGENE**	6.1	II		P2, 2, A7, N33, N34	**A10.6.**
	UN1837	**THIOPHOSPHORYL CHLORIDE**	8	II		P4, A3, A7, N34	**A12.2.**
	UN3341	**THIOREA DIOXIDE**	4.2	II III		P5 P5	**A8.3.** **A8.3.**
		Tin chloride, fuming, see **STANNIC CHLORIDE, ANHYDROUS**					
	UN1293	**TINCTURES, MEDICINAL**	3	II III		P5 P5	**A7.2.** **A7.2.**
		Tinning flux, see **ZINC CHLORIDE**					

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		Tin perchloride or Tin tetrachloride, see **STANNIC CHLORIDE, ANHYDROUS**					
	UN3174	**TITANIUM DISULPHIDE**	4.2	III		P5	**A8.3.**
	UN1871	**TITANIUM HYDRIDE**	4.1	II		P5, A19, A20, N34	**A8.3.**
	UN2546	**TITANIUM POWDER, DRY**	4.2	I II III		P3 P5, A19, A20, N5, N34 P5	**A8.3.** **A8.3.** **A8.3.**
	UN1352	**TITANIUM POWDER, WETTED**, *with not less than 25% water (a visible excess of water must be present) (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns)*	4.1	II		P5, A19, A20, N34	**A8.3.**
	UN2878	**TITANIUM SPONGE GRANULES** *or* **TITANIUM SPONGE POWDERS**	4.1	III		P5, A1	**A8.3.**
+	UN1838	**TITANIUM TETRACHLORIDE**	8	II	6.1	P2, 2, A3, A6	**A12.11.**
	UN2869	**TITANIUM TRICHLORIDE MIXTURES**	8	II III		P5, A7, N34 P5, A7, N34	**A12.3.** **A12.3.**
	UN2441	**TITANIUM TRICHLORIDE, PYROPHORIC**, *or* **TITANIUM TRICHLORIDE MIXTURES, PYROPHORIC**	4.2	I	8	P3, A7,A8, A19, A20, N34	**A8.5.**
		TNT mixed with aluminium, see **TRITONAL**					
		TNT, *see* **TRINITROTOLUENE**, *etc.*					
	UN0209	**TNT**	1.1D			P4, A69	**A5.8.**
	UN0388	**TNT AND HEXANITROSTILBENE MIXTURE or TNT AND TRINITROBENZENE MIXTURE**	1.1D			P4	**A5.8.**
	UN0389	**TNT MIXTURE CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE**	1.1D			P4	**A5.8.**
	UN3366	**TNT, WETTED** ***with more than 10% but less than 30% water, by weight***	4.1	I		P4, A8, A19, N41	**A8.3.**
	UN1294	**TOLUENE**	3	II		P5	**A7.2.**
+	UN2078	**TOLUENE DIISOCYANATE**	6.1	II		P5	**A10.4.**
+	UN1708	**TOLUIDINES, LIQUID**	6.1	II		P5	**A10.4.**
	UN3451	**TOLUIDINES, SOLID**	6.1	II		P5	**A10.5.**
+	UN1709	**2,4-TOLUYLENEDIAMINE, SOLID**	6.1	III		P5	**A10.5.**
	UN3418	**2,4-TOLUYLENEDIAMINE, SOLUTION**	6.1	III		P5	**A10.4.**
	UN0450	**TORPEDOES, LIQUID FUELED**, *with inert head*	1.3J			P3	**A5.4.**
	UN0449	**TORPEDOES, LIQUID FUELED**, *with or without bursting charge*	1.1J			P3	**A5.4.**
	UN0329	**TORPEDOES**, *with bursting charge*	1.1E			P4	**A5.13.**
	UN0330	**TORPEDOES,** *with bursting charge*	1.1F			P4	**A5.13.**
	UN0451	**TORPEDOES**, *with bursting charge*	1.1D			P4	**A5.13.**
	UN3382	**TOXIC BY INHALATION LIQUID, N.O.S.** ***with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}***	6.1				FORBIDDEN

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	UN3381	**TOXIC BY INHALATION LIQUID, N.O.S.** ***with an inhalation toxicity less than or equal to 200 mL/ m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}***	6.1				FORBIDDEN
	UN3390	**TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S.** ***with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}***	6.1		8		FORBIDDEN
	UN3389	**TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S.** ***with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}***	6.1		8		FORBIDDEN
	UN3384	**TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S.** ***with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}***	6.1		3		FORBIDDEN
	UN3383	**TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S.** ***with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}***	6.1		3		FORBIDDEN
	UN3388	**TOXIC BY INHALATION LIQUID, OXIDIZING N.O.S.** ***with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}***	6.1		5.1		FORBIDDEN
	UN3387	**TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S.** ***with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}***	6.1		5.1		FORBIDDEN
	UN3386	**TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S.** ***with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}***	6.1		4.3		FORBIDDEN
	UN3385	**TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S.** ***with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}***	6.1		4.3		FORBIDDEN
*	UN3289	**TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.**	6.1	I II	8 8	P3 P4	**A10.4.** **A10.4.**
*	UN2927	**TOXIC LIQUIDS, CORROSIVE, ORGANIC, N.O.S.**	6.1	I II	8 8	P3 P4	**A10.4.** **A10.4.**
*	UN2929	**TOXIC LIQUIDS, FLAMMABLE, ORGANIC, N.O.S.**	6.1	I II	3 3	P3 P4	**A10.4.** **A10.4.**

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*	UN3287	**TOXIC LIQUID, INORGANIC, N.O.S.**	6.1	I		P3	**A10.4.**
				II		P4	**A10.4.**
				III		P5	**A10.4.**
*	UN2810	**TOXIC LIQUIDS, ORGANIC, N.O.S.**	6.1	I		P3	**A10.4.**
				II		P4	**A10.4.**
				III		P5	**A10.4.**
*	UN3122	**TOXIC LIQUIDS, OXIDIZING, N.O.S.**	6.1	I	5.1	P3, A4	**A10.4.**
				II	5.1	P4	**A10.4.**
*	UN3123	**TOXIC LIQUIDS, WATER-REACTIVE, N.O.S.**	6.1	I	4.3	P3, A4	**A10.4.**
				II	4.3	P4	**A10.4.**
*	UN3290	**TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.**	6.1	I	8	P5	**A10.5.**
				II	8	P5	**A10.5.**
*	UN3288	**TOXIC SOLID, INORGANIC, N.O.S.**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
*	UN2928	**TOXIC SOLIDS, CORROSIVE, ORGANIC, N.O.S.**	6.1	I	8	P5	**A10.5.**
				II	8	P5	**A10.5.**
*	UN2930	**TOXIC SOLIDS, FLAMMABLE, ORGANIC, N.O.S**.	6.1	I	4.1	P5	**A10.5.**
				II	4.1	P5	**A10.5.**
*	UN2811	**TOXIC SOLIDS, ORGANIC, N.O.S.**	6.1	I		P5	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
*	UN3086	**TOXIC SOLIDS, OXIDIZING, N.O.S.**	6.1	I	5.1	P5	**A10.5.**
				II	5.1	P5	**A10.5.**
*	UN3124	**TOXIC SOLIDS, SELF-HEATING, N.O.S.**	6.1	I	4.2	P5, A5	**A10.5.**
				II	4.2	P5	**A10.5.**
*	UN3125	**TOXIC SOLIDS, WATER-REACTIVE, N.O.S.**	6.1	I	4.3	P5, A5	**A10.5.**
				II	4.3	P5	**A10.5.**
*	UN3172	**TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.**	6.1	I		P3, A43	**A10.4.**
				II		P4, A43	**A10.4.**
				III		P5, A43	**A10.4.**
*	UN3462	**TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.**	6.1	I		P5, A43	**A10.5.**
				II		P5, A43	**A10.5.**
				III		P5, A43	**A10.5.**
D	NA0337	**TOY CAPS**	1.4S	II		P5	**A5.17.**
	UN0212	**TRACERS FOR AMMUNITION**	1.3G			P4	**A5.17.**
	UN0306	**TRACERS FOR AMMUNITION**	1.4G			P5	**A5.17.**
		Tri-(b-nitroxyethyl) ammonium nitrate					FORBIDDEN
	UN2610	**TRIALLYLAMINE**	3	III	8	P5	**A7.2.**
	UN2609	**TRIALLYL BORATE**	6.1	III		P5	**A10.4.**

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*	UN2764	**TRIAZINE PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	I II	6.1 6.1	P3 P4	**A7.2.** **A7.2.**
*	UN2997	**TRIAZINE PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	I II III	3 3 3	P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN2998	**TRIAZINE PESTICIDES, LIQUID, TOXIC**	6.1	I II III		P3 P4 P5	**A10.4.** **A10.4.** **A10.4.**
*	UN2763	**TRIAZINE PESTICIDES, SOLID, TOXIC**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
	UN2542	**TRIBUTYLAMINE**	6.1	II		P5	**A10.4.**
	UN3254	**TRIBUTYLPHOSPHANE**	4.2	I		P3	**A8.3.**
		Trichloro-s-triazine dry, with mo9re than 39 percent available chlorine, see **TRICHLOROISOCYANURIC ACID, DRY**					
	UN1839	**TRICHLOROACETIC ACID**	8	II		P5, A7, N34	**A12.3.**
	UN2564	**TRICHLOROACETIC ACID, SOLUTION**	8	II III		P5, A3, A6, A7, N34 P5, A3, A6 A7, N34	**A12.2.** **A12.2.**
+	UN2442	**TRICHLOROACETYL CHLORIDE**	8	II	6.1	P2, 2, A3, A7, N34	**A12.11.**
	UN2321	**TRICHLOROBENZENES, LIQUID**	6.1	III		P5	**A10.4.**
	UN2322	**TRICHLOROBUTENE**	6.1	II		P5	**A10.4.**
	UN2831	**1,1,1-TRICHLOROETHANE**	6.1	III		P5, N36	**A10.4.**
	UN1710	**TRICHLOROETHYLENE**	6.1	III		P5, N36	**A10.4.**
	UN2468	**TRICHLOROISOCYANURIC ACID, DRY**	5.1	II		P5	**A9.6.**
		Trichloromethyl perchlorate					FORBIDDEN
	UN1295	**TRICHLOROSILANE**	4.3	I	3, 8	P3, A7, N34	**A8.2.**
		Trichloro-s-triazinetrione dry, containing over 39% available chlorine, see **TRICHLOROISOCYANURIC ACID, DRY**					
	UN2574	**TRICRESYL PHOSPHATE** *with more than3% ortho isomer*	6.1	II		P5, A3, N33, N34	**A10.4.**
	UN1296	**TRIETHYLAMINE**	3	II	8	P4	**A7.2.**
	UN2259	**TRIETHYLENETETRAMINE**	8	II		P5	**A12.2.**
	UN2323	**TRIETHYL PHOSPHITE**	3	III		P5	**A7.2.**
	UN2699	**TRIFLUOROACETIC ACID**	8	I		P3, A3, A6, A7, N3, N34	**A12.2.**
	UN3057	**TRIFLUOROACETYL CHLORIDE**	2.3		8	P2, 2	**A6.4.**
	UN1082	**TRIFLUOROCHLOROETHYLENE, STABILIZED**	2.3		2.1	P2, 3	**A6.3., A6.4.**
	UN2035	**1,1,1-TRIFLUOROETHANE, COMPRESSED** *or* **REFRIGERANT GAS R143A**	2.1			P4	**A6.3., A6.4.**

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	UN1984	**TRIFLUOROMETHANE** *or* **REFRIGERANT GAS R23**	2.2			P5	**A6.3., A6.4.**
	UN3136	**TRIFLUOROMETHANE, REFRIGERATED LIQUID** *(cryogenic liquids)*	2.2			P4	**A6.3., A6.11.**
	UN2948	**3-TRIFLUOROMETHYLANILINE**	6.1	II		P5	**A10.4.**
	UN2942	**2-TRIFLUOROMETHYLANILINE**	6.1	III		P5	**A10.4.**
		Triformoxime trinitrate					FORBIDDEN
	UN2324	**TRIISOBUTYLENE**	3	III		P5	**A7.2.**
	UN2616	**TRIISOPROPYL BORATE**	3	II III		P5 P5	**A7.2.** **A7.2.**
D	NA9269	**TRIMETHOXYSILANE**	6.1	I	3	P2, 2	**A10.6.**
	UN2438	**TRIMETHYLACETYL CHLORIDE**	6.1	I	8, 3	P2, 2, A3, A6, A7, N34	**A12.11.**
	UN1083	**TRIMETHYLAMINE, ANHYDROUS**	2.1			P4, N87	**A6.3., A6.4.**
	UN1297	**TRIMETHYLAMINE, AQUEOUS SOLUTIONS** *not more than 50% trimethylamine, by mass*	3	I II III	8 8 8	P3 P4 P5	**A7.2.** **A7.2.** **A7.2.**
	UN2325	**1,3,5-TRIMETHYLBENZENE**	3	III		P5	**A7.2.**
	UN2416	**TRIMETHYL BORATE**	3	II		P5	**A7.2.**
	UN1298	**TRIMETHYLCHLOROSILANE**	3	II	8	P5, A3, A7, N34	**A7.2.**
	UN2326	**TRIMETHYLCYCLOHEXYLAMINE**	8	III		P5	**A12.2.**
		Trimethylene glycol diperchlorate					FORBIDDEN
	UN2327	**TRIMETHYLHEXAMETHYL-ENEDIAMINES**	8	III		P5	**A12.2.**
	UN2328	**TRIMETHYLHEXAMETHYLENE DIISOCYANATE**	6.1	III		P5	**A10.4.**
		Trimethylol nitromethane trinitrate					FORBIDDEN
	UN2329	**TRIMETHYL PHOSPHITE**	3	III		P5	**A7.2.**
		1,3,5-Trimethyl-2,4,6-trinitrobenzene					FORBIDDEN
		Trimethyoxy silane					FORBIDDEN
		Trinitroacetic acid					FORBIDDEN
		Trinitroacetonitrile					FORBIDDEN
		Trinitroamine cobalt					FORBIDDEN
	UN0153	**TRINITROANILINE** *or* **PICRAMIDE**	1.1D			P4	**A5.8.**
	UN0213	**TRINITROANISOLE**	1.1D			P4	**A5.8.**
	UN0214	**TRINITROBENZENE,** *dry or wetted, with less than 30% water, by mass*	1.1D			P4	**A5.7.**
	UN0386	**TRINITROBENZENESULPHONIC ACID**	1.1D			P4	**A5.8.**
	UN3367	**TRINITROBENZENE, WETTED** *with not less than 10% water, by mass*	4.1	I		P4, A8, A19, N41	**A8.3.**
	UN1354	**TRINITROBENZENE, WETTED** *with not less than 30% water, by mass*	4.1	I		P4, 23, A2, A8, A19, N41	**A8.3.**
	UN0215	**TRINITROBENZOIC ACID**, *dry or wetted with less than 30% water, by mass*	1.1D			P4	**A5.7.**
	UN3688	**TRINITROBENZOIC ACID, WETTED** *with not less than 10% water, by mass*	4.1	I		P4, A8, A19, N41	**A8.3.**

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	UN1355	**TRINITROBENZOIC ACID, WETTED** *with not less than 30% water, by mass*	4.1	I		P4, 23, A2, A8, A19, N41	**A8.3.**
	UN0155	**TRINITROCHLOROBENZENE** *or* **PICRYL CHLORIDE**	1.1D			P4	**A5.8.**
	UN3365	**TRINITROCHLOROBENZENE, WETTED** *with not less than 10% water, by mass*	4.1	I		P4	**A8.3.**
	UN0216	**TRINITRO-META-CRESOL**	1.1D			P4	**A5.8.**
		2,4,6-Trinitro-1,3-diazobenzene					FORBIDDEN
		2,4,6-Trinitro-1,3,5-triazido benzene (dry)					FORBIDDEN
		Trinitroacetic acid					FORBIDDEN
		Trinitroacetoneitrile					FORBIDDEN
		Trinitroamine cobalt					FORBIDDEN
		Trinitroethanol					FORBIDDEN
		Trinitroethylnitrate					FORBIDDEN
	UN0387	**TRINITROFLUORENONE**	1.1D			P4	**A5.8.**
		Trinitromethane					FORBIDDEN
		1,3,5-Trinitronaphthalene					FORBIDDEN
	UN0217	**TRINITRONAPHTHALENE**	1.1D			P4	**A5.8.**
	UN3364	**TRINITROPHENOL, WETTED** *with not less than 10% water, by mass*	4.1	I		P4, A8, 19, N41	**A8.3.**
	UN0218	**TRINITROPHENETOLE**	1.1D			P4	**A5.8.**
	UN0154	**TRINITROPHENOL** *or* **PICRIC ACID,** *dry or wetted with less than 30% water, by mass*	1.1D			P4	**A5.7.**
	UN1344	**TRINITROPHENOL, WETTED** *with not less than 30% water, by mass*	4.1	I		P4, 23, A8, A19, N41	**A8.3.**
		2,4,6-Trinitrophenyl guanidine (dry)					FORBIDDEN
	UN0208	**TRINITROPHENYLMETHYL-NITRAMINE** *or* **TETRYL**	1.1D			P4	**A5.7.**
		2,4,6-Trinitrophenyl nitramine					FORBIDDEN
		2,4,6-Trinitrophenyl trimethylol methyl nitramine trinitrate (dry)					FORBIDDEN
	UN0219	**TRINITRORESORCINOL** *or* **STYPHNIC ACID,** *dry or wetted with less than 20% water, or mixture of alcohol and water, by mass*	1.1D			P4	**A5.7.**
	UN0394	**TRINITRORESORCINOL WETTED** *or* **STYPHNIC ACID, WETTED** *with not less than 20% water, or mixture of alcohol and water, by mass*	1.1D			P4	**A5.7.**
		2,4,6- Trinitroso-3-methyl nitraminoanisole					FORBIDDEN
		Trinitrotetramine cobalt nitrate					FORBIDDEN
	UN3366	**TRINITROTOLUENE (TNT), WETTED** *with not less than 10% but less than 30% water, by mass*	4.1	I		P4, A8, A19, N41	**A8.3.**
	UN0388	**TRINITROTOLUENE** *or* **TNT AND TRINITRO- BENZENE MIXTURES** *or* **TRINITROTOLUENE** *or* **TNT AND HEXANITROSTILBENE MIXTURES**	1.1D			P4	**A5.8.**
	UN0209	**TRINITROTOLUENE** *or* **TNT,** (*dry or wetted with less than 30% water, by mass)*	1.1D			P4, A69	**A5.8.**

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	UN0389	**TNT MIXTURES, CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE**	1.1D			P4	**A5.8.**
	UN1356	**TRINITROTOLUENE WETTED,** *with not less than 30% water, by mass*	4.1	I		P4, 23, A2, A8, A19, N41	**A8.3.**
		2,4,6-Trinitro-1,3,5-triazido benzene (dry)					FORBIDDEN
		Tri-(b-nitroxyethyl) ammonium nitrate					FORBIDDEN
	UN2260	**TRIPROPYLAMINE**	3	III	8	P5	**A7.2.**
	UN2057	**TRIPROPYLENE**	3	II III		P5 P5	**A7.2.** **A7.2.**
	UN2501	**TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE SOLUTION**	6.1	II III		P5 P5	**A10.4.** **A10.4.**
		Tris bis-bifluoroamino diethoxy propane (TVOPA)					FORBIDDEN
	UN0390	**TRITONAL**	1.1D			P4	**A5.7.**
	UN2196	**TUNGSTEN HEXAFLUORIDE**	2.3		8		FORBIDDEN
	UN1299	**TURPENTINE**	3	III		P5	**A7.2.**
	UN1300	**TURPENTINE SUBSTITUTE**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
		Tyre assemblies inflated, above maximum rated pressure	2.2				FORBIDDEN
		Tyre assemblies inflated, unserviceable, damaged or above maximum rated pressure	2.2				FORBIDDEN
	UN2330	**UNDECANE**	3	III		P5	**A7.2.**
	UN1511	**UREA HYDROGEN PEROXIDE**	5.1	III	8	P5, A1, A7, A29	**A9.6.**
	UN3370	**UREA NITRATE, WETTED** *with not less than 10% but no more than 20% water by mass*	4.1	I		P4, A8, A19, N41	**A8.3.**
	UN0220	**UREA NITRATE,** *dry or wetted with less than 20% water, by mass*	1.1D			P4	**A5.7.**
	UN1357	**UREA NITRATE, WETTED** *with not less than 20% water, by mass*	4.1	I		P4, A8, A19, N41	**A8.3.**
		Urea peroxide, see **UREA HYDROGEN PEROXIDE**					
	UN2058	**VALERALDEHYDE**	3	II		P5	**A7.2.**
		Valeric acid, see **CORROSIVE LIQUID, N.O.S**.					
	UN2502	**VALERYL CHLORIDE**	8	II	3	P5, A3, A6, A7, N34	**A12.2.**
	UN3285	**VANADIUM COMPOUND, N.O.S.**	6.1	I II III		P5 P5 P5	**A10.5.** **A10.5.** **A10.5.**
	UN2443	**VANADIUM OXYTRICHLORIDE**	8	II		P5, A3, A6, A7, N34	**A12.2.**
	UN2862	**VANADIUM PENTOXIDE**, *nonfused form*	6.1	III		P5	**A10.5.**
	UN2444	**VANADIUM TETRACHLORIDE**	8	I		P3, A3, A6, A7, N34	**A12.2.**
	UN2475	**VANADIUM TRICHLORIDE**	8	III		P5	**A12.3.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN2931	**VANADYL SULPHATE**	6.1	II		P5	**A10.5.**
	UN3166	**VEHICLE, FLAMMABLE GAS POWERED**	9			P5, 135	**A13.4.**
	UN3166	**VEHICLE, FLAMMABLE LIQUID POWERED**	9			P5, 135	**A13.4.**
	UN1301	**VINYL ACETATE, STABILIZED**	3	II		P5	**A7.2.**
		Vinyl acetate, unstabilized					FORBIDDEN
	UN1085	**VINYL BROMIDE, STABILIZED**	2.1			P4, N86	**A6.3., A6.4.**
		Vynyl bromide, unstabilized					FORBIDDEN
	UN2838	**VINYL BUTYRATE, STABILIZED**	3	II		P5	**A7.2.**
		Vinyl butyrate, unstabilized					FORBIDDEN
	UN1086	**VINYL CHLORIDE, STABILIZED**	2.1			P4, 21, N86	**A6.3., A6.4.**
		Vinyl chloride, unstabilized					FORBIDDEN
	UN2589	**VINYL CHLOROACETATE**	6.1	II	3	P5	**A10.4.**
	UN1302	**VINYL ETHYL ETHER, STABILIZED**	3	I		P3, A3	**A7.2.**
		Vinyl ethyl ether, unstabilized					FORBIDDEN
	UN1860	**VINYL FLUORIDE, STABILIZED**	2.1			P4, N86	**A6.3., A6.4.**
		Vinyl fluoride, unstabilized					FORBIDDEN
	UN1303	**VINYLIDENE CHLORIDE, STABILIZED**	3	I		P3	**A7.2.**
		Vinylidene chloride, unstabilized					FORBIDDEN
	UN1304	**VINYL ISOBUTYL ETHER, STABILIZED**	3	II		P5	**A7.2.**
		Vinyl isobutyl ether, unstabilized					FORBIDDEN
	UN1087	**VINYL METHYL ETHER, STABILIZED**	2.1			P4	**A6.3., A6.4.**
		Vinyl methyl ether, unstabilized					FORBIDDEN
		Vinyl nitrate polymer					FORBIDDEN
	UN3073	**VINYLPYRIDINES, STABILIZED**	6.1	II	3, 8	P5	**A10.4.**
		Vinylpyridines, unstabilized					FORBIDDEN
	UN2618	**VINYLTOLUENE, STABILIZED**	3	III		P5	**A7.2.**
		Vinyltoulene, unstabilized					FORBIDDEN
	UN1305	**VINYLTRICHLOROSILANE, STABILIZED**	3	I	8	P3, A3, A7, N34	**A7.2.**
		Vinyltrichlorosilane, unstabilized					FORBIDDEN
	UN0370	**WARHEADS,ROCKET** *with burster or expelling charge*	1.4D			P5	**A5.13.**
	UN0371	**WARHEADS, ROCKET** *with burster or expelling charge*	1.4F			P5	**A5.13.**
	UN0286	**WARHEADS, ROCKET** *with bursting charge*	1.1D			P4	**A5.13.**
	UN0287	**WARHEADS, ROCKET** *with bursting charge*	1.2D			P4	**A5.13.**
	UN0369	**WARHEADS, ROCKET** *with bursting charge*	1.1F			P4	**A5.13.**
	UN0221	**WARHEADS, TORPEDO** *with bursting charge*	1.1D			P4	**A5.13.**
*	UN3148	**WATER-REACTIVE LIQUID, N.O.S.**	4.3	I II III		P3 P5 P5	**A8.2.** **A8.2.** **A8.2.**
*	UN3129	**WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.**	4.3	I II III	8 8 8	P3 P4 P5	**A8.2.** **A8.2.** **A8.2.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
*	UN3130	**WATER-REACTIVE LIQUID, N.O.S.**	4.3	I	6.1	P3, A4	**A8.2.**
				II	6.1	P4	**A8.2.**
				III	6.1	P5	**A8.2.**
*	UN2813	**WATER-REACTIVE SOLID, N.O.S.**	4.3	I		P3, N40	**A8.3.**
				II		P5	**A8.3.**
				III		P5	**A8.3.**
*	UN3131	**WATER-REACTIVE SOLID, CORROSIVE, N.O.S.**	4.3	I	8	P3, N40	**A8.3.**
				II	8	P5	**A8.3.**
				III	8	P5	**A8.3.**
*	UN3132	**WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.**	4.3	I	4.1	P3, N40	**A8.3.**
				II	4.1	P5	**A8.3.**
				III	4.1	P5	**A8.3.**
*	UN3133	**WATER-REACTIVE SOLID, OXIDIZING, N.O.S.**	4.3	II	5.1	P3	**A8.4.**
				III	5.1	P5	**A8.4.**
*	UN3134	**WATER-REACTIVE SOLID, TOXIC, N.O.S.**	4.3	I	6.1	P3, A8, N40	**A8.3.**
				II	6.1	P5	**A8.3.**
				III	6.1	P5	**A8.3.**
*	UN3135	**WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.**	4.3	I	4.2	P3, N40	**A8.3.**
				II	4.2	P5	**A8.3.**
				III	4.2	P5	**A8.3.**
		Wheelchair, electric see **BATTERY-POWERED EQUIMENT** *or* **BATTERY-POWERED VEHICLE**					
	UN2590	**WHITE ASBESTOS** *(Chrysotile, actinolite, anthophyllite, tremolite)*	9	III		P5	**A13.16.**
	UN1306	**WOOD PRESERVATIVES, LIQUID**	3	II		P5	**A7.2.**
				III		P5	**A7.2.**
	UN1387	**WOOL WASTE, WET**	4.2	III			FORBIDDEN
	UN3342	**XANTHATES**	4.2	II		P5	**A8.3.**
				III		P5	**A8.3.**
	UN2036	**XENON**	2.2			P5	**A6.3.**, **A6.5.**
	UN2591	**XENON, REFRIGERATED LIQUID** *(cryogenic liquid)*	2.2			P4	**A6.11.**
	UN1307	**XYLENES**	3	II		P5	**A7.2.**
				III		P5	**A7.2.**
	UN3430	**XYLENOLS, LIQUID**	6.1	II		P5	**A10.4.**
	UN2261	**XYLENOLS, SOLID**	6.1	II		P5	**A10.5.**
	UN1711	**XYLIDINES, LIQUID**	6.1	II		P5	**A10.4.**
	UN3452	**XYLIDINES, SOLID**	6.1	II		P5	**A10.6.**
	UN1701	**XYLYL BROMIDE, LIQUID**	6.1	II		P4, A3, A6, A7, N33	**A10.7.**
	UN3417	**XYLYL BROMIDE, SOLID**	6.1	II		P4, A3, A6, A7, N33	**A10.7.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
		p-Xylyl diazide					FORBIDDEN
	UN1512	**ZINC AMMONIUM NITRITE**	5.1	II		P5	**A9.6.**
	UN1712	**ZINC ARSENATE** *or* **ZINC ARSENITE** *or* **ZINC ARSENATE AND ZINC ARSENITE MIXTURES**	6.1	II		P5	**A10.5.**
	UN1435	**ZINC ASHES**	4.3	III		P5, A1, A19	**A8.3.**
		Zinc bisulfiite solution, *see* **BISULFITES, INORGANIC AQUEOUS SOLUTIONS, N.O.S.**					
	UN2469	**ZINC BROMATE**	5.1	III		P5, A1, A29	**A9.6.**
	UN1513	**ZINC CHLORATE**	5.1	II		P5, A9, N34	**A9.6.**
	UN2331	**ZINC CHLORIDE, ANHYDROUS**	8	III		P5	**A12.3.**
	UN1840	**ZINC CHLORIDE, SOLUTION**	8	III		P5	**A12.2.**
	UN1713	**ZINC CYANIDE**	6.1	I		P5	**A10.5.**
	UN1931	**ZINC DITHIONITE** *or* **ZINC HYDROSULPHITE**	9	III		P5	**A13.2.**
		Zinc ethyl, *see* **DIETHYLZINC**					
	UN2855	**ZINC FLUOROSILICATE**	6.1	III		P5	**A10.5.**
		***Zinc muriate solution, see* ZINC CHLORIDE, SOLUTION**					
	UN1514	**ZINC NITRATE**	5.1	II		P5	**A9.6.**
	UN1515	**ZINC PERMANGANATE**	5.1	II		P5	**A9.6.**
	UN1516	**ZINC PEROXIDE**	5.1	II		P5	**A9.6.**
	UN1714	**ZINC PHOSPHIDE**	4.3	I	6.1	P3, A19, N40	**A8.3.**
	UN1436	**ZINC POWDER** or **ZINC DUST**	4.3	I II III	4.2 4.2 4.2	P3, A19, N40 P4, A19 P5	**A8.3.** **A8.3.** **A8.3.**
	UN2714	**ZINC RESINATE**	4.1	III		P5, A1	**A8.3.**
		Zinc selenates, see **SELENATES**					
		Zinc selenite, see **SELENITES**					
		Zinc silicofluoride, see **ZINC FLUOROSILICATE**					
	UN2858	**ZIRCONIUM, DRY**, coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns)	4.1	III		P5, A1	**A8.3.**
	UN2009	**ZIRCONIUM, DRY**, finished sheets, strip, or coiled wire	4.2	III		P5, A1, A19	**A8.3.**
	UN1437	**ZIRCONIUM HYDRIDE**	4.1	II		P5, A19, A20, N34	**A8.3.**
	UN2728	**ZIRCONIUM NITRATE**	5.1	III		P5, A1, A29	**A9.6.**
	UN0236	**ZIRCONIUM PICRAMATE**, dry or wetted with less than 20% water, by mass	1.3C			P4	**A5.10.**
	UN1517	**ZIRCONIUM PICRAMATE, WETTED** with not less than 20% water, by mass	4.1	I		P4, 23, N41	**A8.3.**
	UN2008	**ZIRCONIUM POWDER, DRY**	4.2	I II III		P3 P5, A19, A20, N5, N34 P5	**A8.3.** **A8.3.** **A8.3.**

	UN/ID NUMBER	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN1358	**ZIRCONIUM POWDER, WETTED**, with not less than 25% water (a visible excess of water must be present (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns)	4.1	II		P5, A19, A20, N34	**A8.3.**
	UN1932	**ZIRCONIUM SCRAP**	4.2	III		P5, N34	**A8.3.**
	UN1308	**ZIRCONIUM SUSPENDED IN A LIQUID**	3	I II III		P3 P5 P5	**A7.2.** **A7.2.** **A7.2.**
	UN2503	**ZIRCONIUM TETRACHLORIDE**	8	III		P5	**A12.3.**

Table A4.2. Special Provisions

When column 7 of **Table A4.1.** refers to a special provision for a hazardous material, the meaning and requirements of that provision are defined in this Table. The following list identifies the requirements of the special provisions referred to in column 7 of **Table A4.1.**:

Passenger Eligibility "P" Codes. These provisions apply to passenger movement with hazardous materials (see also **Attachment 22**).

P1 Transport this material on Special Assignment Airlift Mission aircraft as identified in **Attachment 24**. Material authorized on cargo aircraft only. Passenger deviations are not authorized.

P2 Transport this material on cargo aircraft only. Passenger deviations are not authorized.

P3 Transport this material on cargo aircraft only. Deviations are authorized according to paragraph **2.2.** and **Attachment 22**.

P4 Transport this material on cargo aircraft only. Deviations are authorized according to paragraph **2.2.** and **Attachment 22**. DOD duty passengers do not require a deviation.

P5 Transport this material on passenger or cargo aircraft without passenger restriction.

Numeric Special Provisions.

1 This material is poisonous by inhalation in Hazard Zone A, describe as an inhalation hazard.

2 This material is poisonous by inhalation in Hazard Zone B, describe as an inhalation hazard.

3 This material is poisonous by inhalation in Hazard Zone C, describe as an inhalation hazard.

4 This material is poisonous by inhalation in Hazard Zone D, describe as an inhalation hazard.

5 If this material meets the defining criteria for a material poisonous by inhalation (49 CFR 173.116(a) or 173.133(a)) use an appropriate Class 2.3 or Class 6.1 generic PSN that identifies the inhalation hazard.

6 This material is poisonous by inhalation and must be described as an inhalation hazard.

7 An ammonia nitrate fertilizer is a fertilizer formulation, containing 90 percent or more ammonium nitrate and no more than 0.2 percent organic combustible material which does not meet the definition and criteria of a Class 1 material.

8 A hazardous substance that is not a hazardous waste may be shipped under the shipping description "Other regulated substance, liquid or solid", as appropriate.

9 EPA in 40 CFR 761.60 and 761.65 prescribes packaging for certain PCBs for disposal and storage.

11 Package material either as a liquid or solid, as appropriate, depending on its physical form at 55 degrees C (131 degrees F) at atmospheric pressure.

12 In concentrations greater than 40 percent, this material has strong oxidizing properties and is capable of starting fires in contact with combustible materials. If applicable, a package containing this material must comply with the subsidiary risk labeling requirements of **Attachment 15**.

13 The words "Inhalation Hazard" shall be entered on each shipping paper in association with the shipping description.

17 Aqueous solutions of hydrogen peroxide containing less than 8 percent hydrogen peroxide are not subject to the requirements of this manual.

21 This material must be stabilized by appropriate means to prevent dangerous polymerization.

22 If the hazardous material is in dispersion in organic liquid, the organic liquid must have a flash point above 50 degrees C (122 degrees F).

23 Classify this material as Class 4.1 only if it is packed so that the percentage of diluent will not fall below that stated in the shipping description at any time during transport.

27 Sodium carbonate peroxyhydrate is considered nonhazardous.

30 Sulphur is not regulated if transported in a non-bulk packaging or if formed to a specific shape (e.g., prills, granules, pellets, pastilles, or flakes).

31 Materials that have undergone sufficient heat treatment to render them nonhazardous are not subject to the requirements of this manual.

33 Ammonium nitrites and mixtures of an inorganic nitrite with an ammonium salt are prohibited.

36 The maximum net quantity per package is 5 L (1 gallon) or 5 kg (11 lbs.).

43 The nitrogen content of the nitrocellulose must not exceed 11.5 percent. Pack each single filter sheet between sheets of glazed paper. Ensure the portion of glazed paper between the filter sheets is not less than 65 percent, by mass. The membrane filters/paper arrangement must not be liable to propagate a detonation.

46 During transport, it must be protected from direct sunshine and stored (or kept) in a cool and well-ventilated place, away from all sources of heat.

47 Mixtures of solids which are not subject to this subchapter and flammable liquids may be transported under this entry without first applying the classification criteria of Division 4.1, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level. Small inner packagings consisting of sealed packets containing less than 10 mL of a Class 3 liquid in Packing Group II or III absorbed onto a solid material are not subject to this subchapter provided there is no free liquid in the packet.

48 Mixtures of solids which are not subject to this subchapter and toxic liquids may be transported under this entry without first applying the classification criteria of Division 6.1, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level. This entry may not be used for solids containing a Packing Group I liquid.

49 Mixtures of solids which are not subject to this subchapter and corrosive liquids may be transported under this entry without first applying the classification criteria of Class 8, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level.

51 This description applies to items previously described as “Toy propellant devices, Class C” and includes reloaded kits. Model rocket motors containing 30 grams or less propellant are classes as Division 1.4S and items containing more than 30 grams of propellant but not more than 62.5 grams of propellant are classed as Division 1.4C.

53 Packages of these materials must bear a subsidiary risk label, "EXPLOSIVE", unless exempted by the DOT. A copy of the permit must accompany the shipment.

56 Ensure a means to interrupt and prevent detonation of the detonator from initiating the detonating cord is installed between each electric detonator and the detonating cord ends of the jet perforating guns.

60 An oxygen generator, chemical, that is shipped with its means of initiation attached must incorporate at least two positive means of preventing unintentional actuation of the generator, and be classed and approved by the Associate Administrator for Hazardous Materials Safety.

102 This article may be transported as Class 1.4D if all of the conditions specified in 49 CFR 173.63(a) are met. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to **A3.3.1.4.**

103 Detonators that will not mass detonate and undergo only limited propagation in the shipping package may be assigned to Class 1.4B. Mass detonate means that more than 90 percent of the devices tested in a package explode practically simultaneously. Limited propagation means that if one detonator near the center of a shipping package is exploded, the aggregate weight of explosives, excluding ignition and delay charges, in this and all additional detonators in the outer packaging that explode, may not exceed 25 g. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to **A3.3.1.4.**

104 Detonators which meet the following conditions may be assigned to Class 1.4S: Each detonator may contain no more than 1 g of explosive, excluding ignition and delay charges, and if one detonator near the center of the package detonates it will not cause functioning of any other device in the same or adjacent packages. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to **A3.3.1.4.**

105 The word "Agents" may be used instead of "Explosives" when approved by the DOT.

106 The recognized name of the particular explosive may be specified in addition to the type.

107 The classification of the substance is expected to vary especially with the particle size and packaging, but the border lines have not been experimentally determined; appropriate classifications should be verified following the test procedures in 49 CFR 173.57 and 173.58. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to **A3.3.1.4.**

108 Fireworks must be constructed and packaged so that loose pyrotechnic composition is not present in packages during transportation.

109 Rocket motors must be nonpropulsive in transportation unless approved according to **A3.3.1.4.** To be considered "nonpropulsive", a rocket motor must be capable of unrestrained burning and must not appreciably move in any direction when ignited by any means.

110 Fire extinguisher charges containing 3.2 g or less of propellant explosives per unit are not subject to the requirements of this manual unless listed as a Class 1 material in the JHCS. Reclassification as a non-explosive requires approval by a DOD Explosive Hazard Classification Authority according to **A3.3.1.4.**

111 Explosive substances of Class 1.1A are forbidden for transportation if dry or not desensitized, unless incorporated in a device.

112 Cartridges, small arms, Class 1.4S, may be reclassed and offered for domestic transportation as ORM-D material if they are offered for transportation and transported according to the limitations and packaging requirements of 49 CFR 173.144. For Class 1 material listed in the JHCS, reclassification requires approval by a DOD Explosive Hazard Classification Authority according to **A3.3.1.4.**

113 The sample must be given a tentative approval by an agency or laboratory according to the provisions of 49 CFR 173.56.

115 Boosters with detonator (detonating primers) in which the total explosive charge per unit does not exceed 25 g, and which will not mass detonate and undergo only limited propagation in the shipping package may be assigned to Class 1.4B. Mass detonate means more than 90 percent of the devices tested in a package explode practically simultaneously. Limited propagation means that if one booster near the center of the package is exploded, the aggregate weight of explosives, excluding ignition and delay charges, in this and all additional boosters in the outer packaging that explode may not exceed 25 g. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to **A3.3.1.4.**

116 Fuzes, detonating, may be classed in Class 1.4 if the fuzes do not contain more than 25 g of explosive per fuze and are made and packaged so that they will not cause functioning of other fuzes, explosives, or other explosive devices if one of the fuzes detonates in a shipping packaging or in adjacent packages. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to **A3.3.1.4.**

117 If a shipment of the explosive substance is to take place at a time that freezing weather is anticipated, the water contained in the explosive substance must be mixed with denatured alcohol so that freezing will not occur.

123 Any explosive, blasting, type C containing chlorate must be segregated from explosives containing ammonium nitrate or other ammonium salts.

134 This entry applies to vehicles, machinery and equipment that are powered by wet batteries, sodium batteries, or lithium batteries and which are transported with these batteries installed.

135 Change PSN to “Vehicle, flammable gas powered” or “Vehicle, flammable liquid powered”, as appropriate, when internal combustion engines are installed in a vehicle.

139 Use of the "special arrangement" proper shipping names for international shipments must be made under an IAEA Certificate of Competent Authority issued by the Associate Administrator in accordance with the requirements in 49 CFR 173.471, 173.472, or 173.473. Use of these proper shipping names for domestic shipments may be made only under a DOT special permit.

"A" Provisions. These special provisions are in addition to other requirements for military air shipment.

A1 Single packaging is not permitted on aircraft carrying passengers. P4 restrictions apply.

A2 Single packagings are not permitted.

A3 For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packagings.

A4 Liquids having an inhalation toxicity of PG I and are identified as P1, P2, or P3 are not permitted on passenger aircraft. Deviations are not allowed.

A5 Solids having an inhalation toxicity of PG I and are identified as P1, P2, or P3, are not permitted on passenger aircraft and may not exceed a maximum net quantity per package of 15 kg (33 pounds) on cargo aircraft. See paragraph **2.2.** for deviation authority.

A6 For combination packagings, if plastic inner packagings are used, pack in tightly closed metal receptacles before packing into outer packagings.

A7 Steel packagings must be corrosion-resistant or have protection against corrosion.

A8 For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with cushioning material in tightly closed metal receptacles before packing in outer packagings.

A9 For combination packages, if plastic bags are used, they must be packed in tightly closed metal receptacles before packing in outer packagings.

A10 When aluminum or aluminum alloy construction materials are used, they must be resistant to corrosion.

A11 For combination packagings, when metal inner packagings are permitted, only specification cylinders constructed of metals which are compatible with the hazardous material may be used.

A19 Combination packagings consisting of outer fiber drums or plywood drums, with inner plastic packagings, are not authorized.

A20 Plastic bags as inner receptacles of combination packagings are not authorized.

A29 Combination packagings consisting of outer expanded plastic boxes with inner plastic bags are not authorized.

A30 Ammonium permanganate is not authorized.

A33 Ammonium nitrates and mixtures of an inorganic nitrite with an ammonium salt are prohibited.

A35 This includes material which is not covered by any other hazard class but has anesthetic, narcotic, noxious or other properties such that, in the event of spillage or leakage on the aircraft, extreme annoyance or discomfort could be caused to aircrew members so as to prevent correct performance of assigned duties. For material containing aromatic extract or flavoring, use packaging paragraph **A13.2.** For all other material shipped under this PSN, use packaging paragraph **A13.14.**

A37 This entry applies only to a material meeting the definition in 49 CFR 171.8 for self-defense spray.

A43 Toxins from plant, animal or bacterial sources, which contain infectious substances, or toxins that are contained in infectious substances, must be classified as Division 6.2.

A56 Radioactive material with a subsidiary hazard of Division 4.2 Packing Group I must be transported in Type B packages when offered for transportation by aircraft. Radioactive material with a subsidiary hazard of Division 2.1 is forbidden from transport on passenger aircraft.

A58 An aqueous solution containing 24% or less alcohol by volume is not subject to these regulations.

A67 Nonspillable batteries are considered dry batteries and not subject to any other requirements of this manual if:

(1) At a temperature of 55 degrees C (130 degrees F), the electrolyte will not flow from a ruptured or cracked case and there is no free liquid to flow.

(2) Packaged for transport in inner packagings or installed in equipment that effectively prevents activation or short circuit and prevents movement that could lead to short circuit.

A69 May be transported using a DOT hazard classification approval. Except for Class/Division 1.4S, a copy of the approval must accompany the shipment. See **A3.3.1.4.**

A117 Wastes transported under UN 3291 are wastes derived from the medical treatment of humans or animals or from bio-research, where there is a relatively low probability that infectious substances are present. Waste infectious substances which can be specified must be assigned to UN2814 or UN2900. Decontaminated wastes which previously contained infectious substances may be considered as not subject to these regulations unless the criteria of another Class or Division are met.

A124 Only mixtures with not more than 23.5% oxygen may be transported under this entry. A Division 5.1 subsidiary risk label is not required for any concentration within this limit.

A500 P2 Code applies if rocket motor contains hypergolic liquids.

A501 P3 does not apply to unit maintenance and support personnel traveling on Special Assignment Airlift Missions.

A502 With approval of Shipper's HAZMAT service focal point (see paragraph **1.2.2.**), may be shipped as P2.

A503 Only Class 2 (non-toxic aerosols only), Class 3 (Packing Group II or III only) and Division 6.1 (Packing Group III only) provided such substances do not have a subsidiary risk may be shipped to an international (non-domestic) location as a Class 9.

A504 ORM-D designation may only be used for domestic shipments. Substances may also be classified as a Class 9 for domestic shipment. Comply with Special Provision A503 for international shipments.

A505 Cartridges, Small Arms (1.4S) and Cartridges, Power Devices (1.4S) classified by the manufacturer as ORM-D may only be shipped to domestic locations. Ammunition shipped internationally must be classified as explosives (Class 1) and packaged according to **Attachment 5**.

A506 Inner receptacles of a combination package and a single package must be capable of meeting the internal air gauge pressure requirements for a PG III liquid.

A507 Determine passenger eligibility ("P" Coded special provisions) for radioactive materials as follows:

(1) Radioactive materials requiring a Category III-Yellow label will be transported under the provisions of P3. Deviations not authorized unless radioactive material intended for use in, or incident to, research, medical diagnosis, or treatment. Also see **A22.1.7.2.**.

(2) Radioactive materials requiring a Category II-Yellow label will be transported under the provisions of P4. Deviations not authorized unless radioactive material intended for use in, or incident to, research, medical diagnosis, or treatment. Also see **A22.1.7.2.**

(3) Radioactive materials requiring a Category I-White or no label will be transported under the provisions of P5. Also see **A22.1.7.2.**.

A508 Diagnostic, Patient, or Clinical Specimens not containing a Category A or B infectious substances are not regulated by this manual.

"N" Provisions.

N4 For combination or composite packagings, glass inner packagings, other than ampoules, are not permitted.

N5 Glass materials of construction are not authorized for any part of the packaging which is normally in contact with the hazardous material.

N6 Battery fluid packaged with electric storage batteries, wet or dry, must conform to the packaging provisions of **A12.4.4.**

N7 The hazard class or division number of the material must be marked on the package according to 49 CFR 172.302. However, the hazard label corresponding to the hazard class or division may be substituted for the marking.

N8 Nitroglycerin solution in alcohol may be transported under this entry only when the solution is packed in metal cans of not more than 1 L capacity each, overpacked in a wooden box containing not more than 5 L. Completely surround metal cans with absorbent cushioning material. Completely line wooden boxes with a suitable material impervious to water and nitroglycerin.

N10 Lighters and their inner packaging which have been approved by the Associate Administrator must be packaged in one of the following outer packagings at the PG II level: 4C1 or 4C2 wooden boxes; 4D plywood boxes; 4F reconstituted wood boxes; 4G fiberboard boxes; or 4H1 or 4H2 plastic boxes. The approval number (T-****) must be marked on each outer packaging and in Key 19 of the Shipper's Declaration for Dangerous Goods. A copy of the approval does not have to accompany the shipment. Lighters must remain in original packaging approved by the DOT. Repackaging is prohibited.

N12 Plastic packagings are not authorized.

N25 Steel single packagings are not authorized.

N32 Aluminum materials of construction are not authorized for single packagings.

N33 Aluminum drums are not authorized.

N34 Aluminum construction materials are not authorized for any part of a packaging which is normally in contact with the hazardous materials.

N36 Aluminum or aluminum alloy construction materials are permitted only for halogenated hydrocarbons that will not react with aluminum.

N37 This material may be shipped in an integrally-lined fiber drum (1G) which meets the general packaging requirements of **Attachment 3**, the UN performance tests required based on the PG assigned to the material and to any other special provisions of column 7 of **Table A4.1.**

N40 This material is not authorized in the following packagings:

(1) A combination packaging consisting of a 4G fiberboard box with inner receptacles of glass or earthenware.

(2) A single packaging of a 4C2 sift-proof, natural wood box.

(3) A composite packaging 6PG2 (glass, porcelain, or stoneware receptacles within a fiberboard box).

N41 Metal construction materials are not authorized for any part of a packaging that is normally in contact with the hazardous material.

N43 Metal drums are permitted as single packagings only if constructed of nickel or Monel.

N45 For combination packagings, copper cartridges are permitted as inner packagings when the hazardous material is not in dispersion.

N65 Outage must be sufficient to prevent cylinders or spheres from becoming liquid full at 55 degrees C (130 degrees F). The vacant space (outage) may be charged with a nonflammable, nonliquefied compressed gas if the pressure in the cylinder or sphere at 55 degrees C (130 degrees F) does not exceed 125 percent of the marked service pressure.

N73 Packagings consisting of outer wooden or fiberboard boxes with inner glass, metal, or other strong containers; metal or fiber drums; kegs or barrels; or strong metal cans are authorized and need not conform to the UN test requirements for domestic shipment.

N74 Packages consisting of tightly closed inner containers of glass, earthenware, metal or polyethylene, capacity not over 0.5 kg (1.1 pounds) securely cushioned and packed in outer wooden barrels or wooden or fiberboard boxes, not over 15 kg (33 pounds) net weight, are authorized and need not conform to the UN test requirements for domestic shipment.

N75 Packages consisting of tightly closed inner packagings of glass, earthenware, or metal, securely cushioned and packed in outer wooden barrels, or wooden or fiberboard boxes, capacity not over 2.5 kg (5.5 pounds) net weight, are authorized and need not conform to the UN test requirements for domestic shipment.

N76 For materials of not more than 25 percent active ingredient by weight, packages consisting of inner metal packagings not greater than 250 ml (8 ounces) capacity each, packed in strong outer packagings together with sufficient absorbent material to completely absorb the liquid contents are authorized and need not conform to the UN test requirements for domestic shipment.

N77 For materials of not more than two percent active ingredients by weight and the liquid contents are absorbed in an inert material, the packagings need not conform to the UN test requirements for domestic shipment.

N78 Packages consisting of inner glass, earthenware, polyethylene, or other nonfragile plastic bottles or jars not over 0.5 kg (1.1 pounds) capacity each, or metal cans not over 5 pounds capacity each, packed in outer wooden boxes, barrels, kegs, or fiberboard boxes, are authorized and need not conform to the UN test requirements for domestic shipments. Net weight of contents in fiberboard boxes may not exceed 29 kg (64 pounds). Net weight of contents in wooden boxes, barrels, or kegs may not exceed 45 kg (99 pounds).

N79 Packages consisting of tightly closed metal inner packagings not over 0.5 kg (1.1 pounds) capacity each, packed in outer wooden or fiberboard boxes, or wooden barrels, are authorized and need not conform to UN test requirements for domestic shipment. Net weight of contents may not exceed 15 kg (33 pounds).

N86 UN pressure receptacles made of aluminum alloy are not authorized.

N87 The use of copper valves on UN pressure receptacles is prohibited.

N88 Any metal part of a UN pressure receptacle in contact with the contents may not contain more than 65% copper, with a tolerance of 1%.

N89 When steel UN pressure receptacles are used, only those bearing the “H” mark are authorized.

Table A4.3. Hazardous Substance and Reportable Quantities.

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Acenaphthene	100 (45.4)
Acenaphthylene	5000 (2270)
Acetaldehyde	1000 (454)
Acetaldehyde, chloro-	1000 (454)
Acetaldehyde, trichloro-	5000 (2270)
Acetamide	100 (45.4)
Acetamide, N-(aminothioxomethyl)-	1000 (454)
Acetamide, N-(4-ethoxyphenyl)-	100 (45.4)
Acetamide, N-fluoren-2-yl-	1 (0.454)
Acetamide, 2-fluoro-	100 (45.4)
Acetic acid	5000 (2270)
Acetic acid (2,4-dichlorophenoxy)-	100 (45.4)
Acetic acid, ethyl ester	5000 (2270)
Acetic acid, fluoro-, sodium salt	10 (4.54)
Acetic acid, lead (2+) salt	10 (4.54)
Acetic acid, thallium (I+) salt	1000 (454)
Acetic acid, (2,4,5-trichlorophenoxy)	1000 (454)
Acetic anhydride	5000 (2270)
Acetone	5000 (2270)
Acetone cyanohydrin	10 (4.54)
Acetonitrile	5000 (2270)
Acetophenone	5000 (2270)
2-Acetylaminofluorene	1 (0.454)
Acetyl bromide	5000 (2270)
Acetyl chloride	5000 (2270)
1-Acetyl-2-thiourea	1000 (454)
Acrolein	1 (0.454)
Acrylamide	5000 (2270)
Acrylic acid	5000 (2270)
Acrylonitrile	100 (45.4)
Adipic acid	5000 (2270)
Aldicarb	1 (0.454)
Aldrin	1 (0.454)
Allyl alcohol	100 (45.4)
Allyl chloride	1000 (454)
Aluminum phosphide	100 (45.4)
Aluminum sulfate	5000 (2270)
4-Aminobiphenyl	1 (0.454)
4-Aminopyridine	1000 (454)
5-(Aminomethyl)-3-isoxazolol	1000 (454)
Amitrole	10 (4.54)
Ammonia	100 (45.4)
Ammonium acetate	5000 (2270)
Ammonium benzoate	5000 (2270)
Ammonium bicarbonate	5000 (2270)
Ammonium bichromate	10 (4.54)
Ammonium bifluoride	100 (45.4)
Ammonium bisulfite	5000 (2270)
Ammonium carbamate	5000 (2270)
Ammonium carbonate	5000 (2270)
Ammonium chloride	5000 (2270)
Ammonium chromate	10 (4.54)
Ammonium citrate, dibasic	5000 (2270)
Ammonium dichromate *	10 (4.54)
Ammonium fluoborate	5000 (2270)
Ammonium fluoride	100 (45.4)
Ammonium hydroxide	1000 (454)
Ammonium oxalate	5000 (2270)
Ammonium picrate	10 (4.54)
Ammonium silicofluoride	1000 (454)
Ammonium sulfamate	5000 (2270)
Ammonium sulfide	100 (45.4)
Ammonium sulfite	5000 (2270)
Ammonium tartrate	5000 (2270)
Ammonium thiocyanate	5000 (2270)
Ammonium vanadate	1000 (454)
Amyl acetate	5000 (2270)
iso-Amyl acetate	
sec-Amyl acetate	
tert-Amyl acetate	
Aniline	5000 (2270)
o-Anisidine	100 (45.4)
Anthracene	5000 (2270)
Antimony +	5000 (2270)
Antimony pentachloride	1000 (454)
Antimony potassium tartrate	100 (45.4)
Antimony tribromide	1000 (454)
Antimony trichloride	1000 (454)
Antimony trifluoride	1000 (454)
Antimony trioxide	1000 (454)
Argentate(1-), bis(cyano-C)-, potassium	1 (0.454)
Aroclor 1016	1 (0.454)
Aroclor 1221	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Aroclor 1232	1 (0.454)
Aroclor 1242	1 (0.454)
Aroclor 1248	1 (0.454)
Aroclor 1254	1 (0.454)
Aroclor 1260	1 (0.454)
Arsenic +	1 (0.454)
Arsenic acid	1 (0.454)
Arsenic acid H3AsO4	1 (0.454)
Arsenic disulfide	1 (0.454)
Arsenic oxide As203	1 (0.454)
Arsenic oxide As205	1 (0.454)
Arsenic pentoxide	1 (0.454)
Arsenic trichloride	1 (0.454)
Arsenic trioxide	1 (0.454)
Arsenic trisulfide	1 (0.454)
Arsine, diethyl-	1 (0.454)
Arsinic acid, dimethyl-	1 (0.454)
Arsonous dichloride, phenyl-	1 (0.454)
Asbestos ++	1 (0.454)
Auramine	100 (45.4)
Azaserine	1 (0.454)
Aziridine	1 (0.454)
Aziridine, 2-methyl-	1 (0.454)
Azirino[2',3':3,4]pyrrolo(1,2-a)indole-4, 7-dione, 6-amino-8-[[aminocarbonyl)oxy]methyl]-1,1a,2, 8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(aalpha,8beta,8aalpha,8balpha)]	10 (4.54)
Barium cyanide	10 (4.54)
Benz[j]aceanthrylene,1,2-dihydro-3-methyl-	10 (4.54)
Benz[c]acridine	100 (45.4)
3,4-Benzacridine	100 (45.4)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Benzal chloride	5000 (2270)
Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)	5000 (2270)
Benz[a]anthracene	10 (4.54)
1,2-Benzanthracene	10 (4.54)
Benz[a]anthracene 7,12-dimethyl-	1 (0.454)
Benzenamine	5000 (2270)
Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl-	100 (45.4)
Benzenamine, 4-chloro-	1000 (454)
Benzenamine, 4-chloro-2-methyl-, hydrochloride	100 (45.4)
Benzenamine, N,N-dimethyl-4-(phenylazo)-	10 (4.54)
Benzenamine, 2-methyl-	100 (45.4)
Benzenamine, 4-methyl-	100 (45.4)
Benzenamine, 4,4'-methylenebis(2-chloro-	10 (4.54)
Benzenamine, 2- methyl-,hydrochloride	100 (45.4)
Benzenamine, 2-methyl-5-nitro-	100 (45.4)
Benzenamine, 4-nitro-	5000 (2270)
Benzene	10 (4.54)
Benzene, 1-bromo-4-phenoxy-	100 (45.4)
Benzene, chloro-	100 (45.4)
Benzene, chloromethyl-	100 (45.4)
Benzene, 1,2-dichloro-	100 (45.4)
Benzene, 1,3-dichloro-	100 (45.4)
Benzene, 1,4-dichloro-	100 (45.4)
Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro	1 (0.454)
Benzene, dichloromethyl-	5000 (2270)
Benzene, 1,3-diisocyanatomethyl	100 (45.4)
Benzene, dimethyl-	100 (45.4)
Benzene, m-dimethyl-	1000 (454)
Benzene, o-dimethyl-	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Benzene, p-dimethyl-	100 (45.4)
Benzene, hexachloro-	10 (4.54)
Benzene, hexahydro-	1000 (454)
Benzene, hydroxy-	1000 (454)
Benzene, methyl-	1000 (454)
Benzene, 1-methyl-2,4-dinitro-	10 (4.54)
Benzene, 2-methyl-1,3-dinitro-	100 (45.4)
Benzene, 1-methylethyl-	5000 (2270)
Benzene, nitro-	1000 (454)
Benzene, pentachloro-	10 (4.54)
Benzene, pentachloronitro-	100 (45.4)
Benzene, 1,2,4,5-tetrachloro-	5000 (2270)
Benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4-chloro-	1 (0.454)
Benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4-methoxy]-	1 (0.454)
Benzene, (trichloromethyl)	10 (4.54)
Benzene, 1,3,5-trinitro-	10 (4.54)
Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)- alpha- hydroxy, ethyl ester	10 (4.54)
Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	10 (4.54)
Benzenediamine, ar-methyl-	10 (4.54)
1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)] ester	100 (45.4)
1,2-Benzenedicarboxylic acid, dibutyl ester	10 (4.54)
1,2-Benzenedicarboxylic acid, diethyl ester	1000 (454)
1,2-Benzenedicarboxylic acid, dimethyl ester	5000 (2270)
1,2-Benzenedicarboxylic acid, dioctyl ester	5000 (2270)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
1,3-Benzenediol	5000 (2270)
1,2-Benzenediol,4-[1-hydroxy-2-(methylamino) ethyl]-	1000 (454)
Benzeneethanamine, alpha,alpha-dimethyl-	5000 (2270)
Benzenesulfonic acid chloride	100 (45.4)
Benzenesulfonyl chloride	100 (4.54)
Benzenethiol	100 (45.4)
Benzidine	1 (0.454)
1,2-Benzisothiazol-3(2H)-one,1, 1-dioxide	100 (45.4)
Benz[o]aanthracene	10 (4.54)
1,3-Benzodioxole, 5-(2-propenyl)-	100 (45.4)
1,3-Benzodioxole, 5-(1-propenyl)-	100 (45.4)
1,3-Benzodioxole, 5-propyl-	10 (4.54)
Benzo[b]fluoranthene	1 (0.454)
Benzo[k]fluoranthene	5000 (2270)
Benzo[j,k]fluorene	100 (45.4)
Benzoic acid	5000 (2270)
Benzonitrile	5000 (2270)
Benzo[g,h,i]perylene	5000 (2270)
2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenyl-buthyl)-, & salts, when present at concentrations greater than 0.3%	100 (45.4)
Benzo[a]pyrene	1 (0.454)
3,4-Benzopyrene	1 (0.454)
p-Benzoquinone	10 (4.54)
Benzo [rst]pentaphene	10 (4.54)
Benzotrichloride	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Benzoyl chloride	1000 (454)
1,2-Benzphenanthrene	100 (45.4)
Benzyl chloride	100 (45.4)
Beryllium +	10 (4.54)
Beryllium chloride	1 (0.454)
Beryllium dust +	10 (4.54)
Beryllium fluoride	1 (0.454)
Beryllium nitrate	1 (0.454)
alpha - BHC	10 (4.54)
beta - BHC	1 (0.454)
delta - BHC	1 (0.454)
gamma - BHC	1 (0.454)
2,2'-Bioxirane	10 (4.54)
Biphenyl	100 (45.4)
(1,1'-Biphenyl)-4,4'-diamine	1 (0.454)
(1,1'-Biphenyl)-4,4'-diamine,3,3'-dichloro-	1 (0.454)
(1,1'-Biphenyl)-4,4'-diamine,3,3'-dimethoxy-	10 (4.54)
(1,1'-Biphenyl)-4,4'-diamine,3,3'-dimethyl-	10 (4.54)
Bis(2-chloroethoxy) methane	1000 (454)
Bis(2-chloroethyl) ether	10 (4.54)
Bis(2-ethylhexyl)phthalate	100 (45.4)
Bromoacetone	1000 (454)
Bromoform	100 (45.4)
4-Bromophenyl phenyl ether	100 (45.4)
Brucine	100 (45.4)
1,3-Butadiene	10 (4.54)
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	1 (0.454)
1-Butanamine, N-butyl-N-nitroso-	10 (4.54)
1-Butanol	5000 (2270)
2-Butanone	5000 (2270)
2-Butanone, 3,3-dimethyl-1-(methylthio)-,O-[(methylamino) carbonyl] oxime	100 (45.4)
2-Butanone peroxide	10 (4.54)
2-Butenal	100 (45.4)
2-Butene, 1,4-dichloro-	1 (0.454)
2-Butenoic acid,2-methyl-, 7 [[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5, 7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z), 7 (2S*,3R*),7aalpha]]-	10 (4.54)
Butyl acetate	5000 (2270)
iso-Butyl acetate	
sec-Butyl acetate	
tert-Butyl acetate	
n-Butyl alcohol	5000 (2270)
Butylamine	1000 (454)
iso-Butylamine	
sec-Butylamine	
tert-Butylamine	
Butyl benzyl phthalate	100 (45.4)
n-Butyl phthalate	10 (4.54)
Butyric acid	5000 (2270)
iso-Butyric acid	
Cacodylic acid	1 (0.454)
Cadmium +	10 (4.54)
Cadmium acetate	10 (4.54)
Cadmium bromide	10 (4.54)
Cadmium chloride	10 (4.54)
Calcium arsenate	1 (0.454)
Calcium arsenite	1 (0.454)
Calcium carbide	10 (4.54)
Calcium chromate	10 (4.54)
Calcium cyanamide	1000 (454)
Calcium cyanide	10 (4.54)
Calcium cyanide Ca(CN)2	10 (4.54)
Calcium DODecylbenzene sulfonate	1000 (454)
Calcium hypochlorite	10 (4.54)
Camphene, octachloro-	1 (0.454)
Caprolactam	5000 (2270)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Captan	10 (4.54)
Carbamic acid, ethyl ester	100 (45.4)
Carbamic acid, methylnitroso-, ethyl ester	1 (0.454)
Carbamic chloride, dimethyl-	1 (0.454)
Carbamide, thio-	10 (4.54)
Carbamimidoselenoic acid	1000 (454)
Carbamothioic acid, bis (1-methylethyl)-,S-(2,3-dichloro-2-propenyl) ester	100 (45.4)
Carbaryl	100 (45.4)
Carbofuran	10 (4.54)
Carbon bisulfide	100 (45.4)
Carbon disulfide	100 (45.4)
Carbonic acid, dithallium (1+)	100 (45.4)
Carbonic dichloride	10 (4.54)
Carbonic difluoride	1000 (454)
Carbonochloridic acid, methyl ester	1000 (454)
Carbon oxyfluoride	1000 (454)
Carbon tetrachloride	10 (4.54)
Carbonyl sulfide	100 (45.4)
Catechol	100 (45.4)
Chloral	5000 (2270)
Chloramben	100 (45.4)
Chlorambucil	10 (4.54)
Chlordane	1 (0.454)
Chlordane, alpha & gamma isomers	1 (0.454)
Chlordane, technical	1 (0.454)
Chlorine	10 (4.54)
Chlornaphazine	100 (45.4)
Chloroacetaldehyde	1000 (454)
Chloroacetic acid	100 (45.4)
2-Chloroacetophenone	100 (45.4)
p-Chloroaniline	1000 (454)
Chlorobenzene	100 (45.4)
Chlorobenzilate	10 (4.54)
4-Chloro-m-cresol	5000 (2270)
p-Chloro-m-cresol	5000 (2270)
Chlorodibromomethane	100 (45.4)
Chloroethane	100 (45.4)
2-Chloroethyl vinyl ether	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Chloroform	10 (4.54)
Chloromethane	100 (45.4)
Chloromethyl methyl ether	10 (4.54)
beta-Chloronaphthalene	5000 (2270)
2-Chloronaphthalene	5000 (2270)
2-Chlorophenol	100 (45.4)
o-Chlorophenol	100 (45.4)
4-Chlorophenyl phenyl ether	5000 (2270)
1-(o-Chlorophenyl)thiourea	100 (45.4)
Chloroprene	100 (45.4)
3-Chloropropionitrile	1000 (454)
Chlorosulfonic acid	1000 (454)
4-Chloro-o-toluidine, hydrochloride	100 (45.4)
Chlorpyrifos	1 (0.454)
Chromic acetate	1000 (454)
Chromic acid	10 (4.54)
Chromic acid H2CrO4, calcium salt	10 (4.54)
Chromic sulfate	1000 (454)
Chromium +	5000 (2270)
Chromous chloride	1000 (454)
Chrysene	100 (45.4)
Cobaltous bromide	1000 (454)
Cobaltous formate	1000 (454)
Cobaltous sulfamate	1000 (454)
Coke Oven Emissions	1 (0.454)
Copper +	5000 (2270)
Copper chloride *	10 (4.54)
Copper cyanide	10 (4.54)
Copper cyanide CuCN	10 (4.54)
Coumaphos	10 (4.54)
Creosote	1 (0.454)
Cresols (isomers and mixture)	100 (45.4)
m-Cresol	100 (45.4)
o-Cresol	100 (45.4)
p-Cresol	100 (45.4)
Cresylic acid (isomers and mixture)	100 (45.4)
m-Cresylic acid	100 (45.4)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
o-Cresylic acid	100 (45.4)
p-Cresylic acid	100 (45.4)
Crotonaldehyde	100 (45.4)
Cumene	5000 (2270)
Cupric acetate	100 (45.4)
Cupric acetoarsenite	1 (0.454)
Cupric chloride	10 (4.54)
Cupric nitrate	100 (45.4)
Cupric oxalate	100 (45.4)
Cupric sulfate	10 (4.54)
Cupric sulfate ammoniated	100 (45.4)
Cupric tartrate	100 (45.4)
Cyanides (soluble salts and complexes) not otherwise specified	10 (4.54)
Cyanogen	100 (45.4)
Cyanogen bromide	1000 (454)
Cyanogen bromide (CN)Br	1000 (454)
Cyanogen chloride	10 (4.54)
Cyanogen chloride (CN)Cl	10 (4.54)
2,5-Cyclohexadiene-1,4-dione	10 (4.54)
Cyclohexane	1000 (454)
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha, 3beta, 4alpha,5alpha,6beta)-	1 (0.454)
Cyclohexanone	5000 (2270)
2-Cyclohexyl-4,6-dinitrophenol	100 (45.4)
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	10 (4.54)
Cyclophosphamide	10 (4.54)
2,4-D Acid	100 (45.4)
2,4-D Ester	100 (45.4)
Daunomycin	10 (4.54)
DDD	1 (0.454)
4,4'-DDD	1 (0.454)
DDE	5000 (2270)
4,4'-DDE	5000 (2270)
DDT	1 (0.454)
4,4'-DDT	1 (0.454)
Diallate	100 (45.4)
Diamine	1 (0.454)
Diazinon	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Diazomethane	100 (45.4)
Dibenz[a,h]anthracene	1 (0.454)
1,2:5,6-Dibenzanthracene	1 (0.454)
Dibenzo[a,h]anthracene	1 (0.454)
Dibenz[a,i]pyrene	10 (4.54)
Dibenzofuran	100 (45.4)
1,2-Dibromo-3-chloropropane	1 (0.454)
Dibutyl phthalate	10 (4.54)
Di-n-butyl phthalate	10 (4.54)
Dicamba	1000 (454)
Dichlobenil	100 (45.4)
Dichlone	1 (0.454)
Dichlorobenzene	100 (45.4)
1,2-Dichlorobenzene	100 (45.4)
1,3-Dichlorobenzene	100 (45.4)
1,4 Dichlorobenzene	100 (45.4)
m-Dichlorobenzene	100 (45.4)
o-Dichlorobenzene	100 (45.4)
p-Dichlorobenzene	100 (45.4)
3,3'-Dichlorobenzidine	1 (0.454)
Dichlorobromomethane	5000 (2270)
1,4 Dichloro-2-butene	1 (0.454)
Dichlorodifluoromethane	5000 (2270)
1,1 Dichloroethane	1000 (454)
1,2 Dichloroethane	100 (45.4)
1,1-Dichloroethylene	100 (45.4)
1,2 Dichloroethylene	1000 (454)
Dichloroethyl ether	10 (4.54)
Dichloroisopropyl--ether	1000 (454)
Dichloromethane *	1000 (454)
Dichloromethoxy ethane	1000 (454)
Dichloromethyl ether	10 (4.54)
2,4 Dichlorophenol	100 (45.4)
2,6-Dichlorophenol	100 (45.4)
Dichlorophenylarsine	1 (0.454)
Dichloropropane	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
1,1-Dichloropropane	
1,3-Dichloropropane	
1,2-Dichloropropane	1000 (454)
Dichloropropane - Dichloropropene (mixture)	100 (45.4)
Dichloropropene	100 (45.4)
2,3-Dichloropropene	
1,3-Dichloropropene	100 (45.4)
2,2-Dichloropropionic acid	5000 (2270)
Dichlorvos	10 (4.54)
Dicofol	10 (4.54)
Dieldrin	1 (0.454)
1,2:3,4-Diepoxybutane	10 (4.54)
Diethanolamine	100 (45.4)
Diethylamine	1000 (454)
N,N-diethylaniline	1000 (454)
Diethylarsine	1 (0.454)
1,4-Diethylenedioxide	100 (45.4)
Diethylhexyl phthalate	100 (45.4)
N,N'-Diethylhydrazine	10 (4.54)
O,O-Diethyl S-methyl dithiophosphate	5000 (2270)
Diethyl-p-nitrophenyl phosphate	100 (45.4)
Diethyl phthalate	1000 (454)
O,O-Diethyl O-pyrazinyl phosphorothioate	100 (45.4)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Diethylstilbestrol	1 (0.454)
Diethyl sulfate	10 (4.54)
Dihydrosafrole	10 (4.54)
Diisopropyl fluorophosphate	100 (45.4)
1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10, 10-hexachloro-1,4, 4a,5, 8,8a-hexahydro, (1alpha, 4alpha, 4abeta, 5abeta,8beta, 8abeta)-	1 (0.454)
1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10, 10-10-hexachloro-1,4, 4a,5,8,8a-hexahydro-,(1alpha, 4alpha, 4abeta,5alpha,8alpha, 8abeta)-	1 (0.454)
2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7, 7a-octahydro-, (1aalpha,2beta, 2abeta, 3alpha,6alpha,6abeta, 7beta, 7aalpha)-	1 (0.454)
2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro -1a,2,2a,3,6,6a,7, 7a-octahydro-, (1aalpha,2beta,2aalpha, 3beta, 6beta,6aalpha,7beta, 7aalpha)-	1 (0.454)
Dimethoate	10 (4.54)
3,3'-Dimethoxybenzidine	10 (4.54)
Dimethylamine	1000 (454)
p-Dimethylaminoazobenzene	10 (4.54)
N,N-dimethylaniline	100 (45.4)
7,12-Dimethylbenz[a]anthracene	1 (0.454)
3,3'-Dimethylbenzidine	10 (4.54)
alpha,alpha-Dimethylbenzylhydroperoxide	10 (4.54)
Dimethylcarbamoyl chloride	1 (0.454)
Dimethylformamide	100 (45.4)
1,1-Dimethylhydrazine	10 (4.54)
1,2-Dimethylhydrazine	1 (0.454)
Dimethylhydrazine, unsymmetrical *	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
alpha,alpha-Dimethylphenethylamine	5000 (2270)
2,4-Dimethylphenol	100 (45.4)
Dimethyl phthalate	5000 (2270)
Dimethyl sulfate	100 (45.4)
Dinitrobenzene (mixed)	100 (45.4)
m-Dinitrobenzene	
o-Dinitrobenzene	
p-Dinitrobenzene	
4,6-Dinitro-o-cresol and salts	10 (4.54)
Dinitrogen tetroxide *	10 (4.54)
Dinitrophenol	10 (4.54)
2,5-Dinitrophenol	
2,6-Dinitrophenol	
2,4-Dinitrophenol	10 (4.54)
Dinitrotoluene	10 (4.54)
3,4-Dinitrotoluene	
2,4-Dinitrotoluene	10 (4.54)
2,6-Dinitrotoluene	100 (45.4)
Dinoseb	1000 (454)
Di-n-octyl phthalate	5000 (2270)
1,4-Dioxane	100 (45.4)
1,2-Diphenylhydrazine	10 (4.54)
Diphosphoramide, octamethyl-	100 (45.4)
Diphosphoric acid, tetraethyl ester	10 (4.54)
Dipropylamine	5000 (2270)
Di-n-propylnitrosamine	10 (4.54)
Diquat	1000 (454)
Disulfoton	1 (0.454)
Dithiobiuret	100 (45.4)
Diuron	100 (45.4)
DODecylbenzenesulfonic acid	1000 (454)
2,4-D,salts and esters	100 (45.4)
Endosulfan	1 (0.454)
alpha - Endosulfan	1 (0.454)
beta - Endosulfan	1 (0.454)
Endosulfan sulfate	1 (0.454)
Endothall	1000 (454)
Endrin	1 (0.454)
Endrin, & metabolites	1 (0.454)
Endrin aldehyde	1 (0.454)
Epichlorohydrin	100 (45.4)
Epinephrine	1000 (454)
1,2-Epoxybutane	100 (45.4)
Ethanol	1000 (454)
Ethanamine, N-ethyl-N-nitroso-	1 (0.454)
Ethane, 1,2-dibromo-	1 (0.454)
Ethane, 1,1-dichloro-	1000 (454)
Ethane, 1,2-dichloro-	100 (45.4)
Ethane, hexachloro-	100 (45.4)
Ethane, 1,1'-[methylenebis (oxy)]bis(2-chloro-	1000 (454)
Ethane, 1,1'-oxybis-	100 (45.4)
Ethane, 1,1'-oxybis(2-chloro-	10 (4.54)
Ethane, pentachloro-	10 (4.54)
Ethane, 1,1,1,2-tetrachloro-	100 (45.4)
Ethane, 1,1,2,2 tetrachloro-	100 (45.4)
Ethane, 1,1,2-trichloro-	100 (45.4)
Ethane, 1,1,1-trichloro-	1000 (454)
1,2-Ethanediamine, N, N-dimethyl-N'-2-pyridinyl-N'-(2-thienyl-methyl)-	5000 (2270)
Ethanedinitrile	100 (45.4)
Ethanenitrile	5000 (2270)
Ethanethioamide	10 (4.54)
Ethanimidothioic acid, N-[[(methylamino) carbonyl] oxy]-, methyl ester	100 (45.4)
Ethanol, 2-ethoxy-	1000 (454)
Ethanol, 2,2'-(nitrosoimino)bis-	1 (0.454)
Ethanone, 1-phenyl-	5000 (2270)
Ethanoyl chloride	5000 (2270)
Ethene, chloro-	1 (0.454)
Ethene, 2-chloroethoxy-	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Ethene, 1,1-dichloro-	100 (45.4)
Ethene, 1,2-dichloro- (E)	1000 (454)
Ethene, tetrachloro-	100 (45.4)
Ethene, trichloro-	100 (45.4)
Ethion	10 (4.54)
Ethyl acetate	5000 (2270)
Ethyl acrylate	1000 (454)
Ethylbenzene	1000 (454)
Ethyl carbamate (Urethan)	100 (45.4)
Ethyl chloride *	100 (45.4)
Ethyl cyanide	10 (4.54)
Ethylene dibromide	1 (0.454)
Ethylene dichloride	100 (45.4)
Ethylene glycol	5000 (2270)
Ethylene glycol monoethyl ether	1000 (454)
Ethylene oxide	10 (4.54)
Ethylenebisdithiocarbamic acid	5000 (2270)
Ethylenebisdithiocarbamic acid, salts and esters	5000 (2270)
Ethylenediamine	5000 (2270)
Ethylenediamine tetraacetic acid (EDTA)	5000 (2270)
Ethylenethiourea	10 (4.54)
Ethylenimine	1 (0.454)
Ethyl ether	100 (45.4)
Ethylidene dichloride	1000 (454)
Ethyl methacrylate	1000 (454)
Ethyl methanesulfonate	1 (0.454)
Ethyl methyl ketone *	5000 (2270)
Famphur	1000 (454)
Ferric ammonium citrate	1000 (454)
Ferric ammonium oxalate	1000 (454)
Ferric chloride	1000 (454)
Ferric fluoride	100 (45.4)
Ferric nitrate	1000 (454)
Ferric sulfate	1000 (454)
Ferrous ammonium sulfate	1000 (454)
Ferrous chloride	100 (45.4)
Ferrous sulfate	1000 (454)
Fluoranthene	100 (45.4)
Fluorene	5000 (2270)
Fluorine	10 (4.54)
Fluoroacetamide	100 (45.4)
Fluoroacetic acid, sodium salt	10 (4.54)
Formaldehyde	100 (45.4)
Formic acid	5000 (2270)
Fulminic acid, mercury(2+)salt	10 (4.54)
Fumaric acid	5000 (2270)
Furan	100 (45.4)
Furan, tetrahydro-	1000 (454)
2-Furancarboxaldehyde	5000 (2270)
2,5-Furandione	5000 (2270)
Furfural	5000 (2270)
Furfuran	100 (45.4)
Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	1 (0.454)
D-Glucose, 2-deoxy-2-[[methylnitrosoamino)-carbonyl]amino]-	1 (0.454)
Glycidylaldehyde	10 (4.54)
Guanidine, N-methyl-N'nitro-N-nitroso	10 (4.54)
Guthion	1 (0.454)
Heptachlor	1 (0.454)
Heptachlor epoxide	1 (0.454)
Hexachlorobenzene	10 (4.54)
Hexachlorobutadiene	1 (0.454)
Hexachlorocyclohexane (gamma isomer)	1 (0.454)
Hexachlorocyclopentadiene	10 (4.54)
Hexachloroethane	100 (45.4)
1,2,3,4,10-10-Hexachloro-1,4,4a,5,8, 8a-hexahydro-1,4:5, 8-endo,exo- dimethanonaphthalene	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Hexachlorophene	100 (45.4)
Hexachloropropene	1000 (454)
Hexaethyl tetraphosphate	100 (45.4)
Hexamethylene-1,6-diisocyanate	100 (45.4)
Hexamethylphosphoramide	1 (0.454)
Hexane	5000 (2270)
Hydrazine	1 (0.454)
Hydrazine, 1,2-diethyl-	10 (4.54)
Hydrazine, 1,1-dimethyl-	10 (4.54)
Hydrazine, 1,2-dimethyl-	1 (0.454)
Hydrazine, 1,2-diphenyl-	10 (4.54)
Hydrazine, methyl-	10 (4.54)
Hydrazinecarbothioamide	100 (45.4)
Hydrochloric acid	5000 (2270)
Hydrocyanic acid	10 (4.54)
Hydrofluoric acid	100 (45.4)
Hydrogen chloride	5000 (2270)
Hydrogen cyanide	10 (4.54)
Hydrogen fluoride	100 (45.4)
Hydrogen phosphide	100 (45.4)
Hydrogen sulfide	100 (45.4)
Hydrogen sulfide H2S	100 (45.4)
Hydroperoxide, 1-methyl-1-phenylethyl-	10 (4.54)
Hydroquinone	100 (45.4)
2-Imidazolidinethione	10 (4.54)
Indeno(1,2,3-cd)pyrene	100 (45.4)
1,3-Isobenzofurandione	5000 (2270)
Isobutyl alcohol	5000 (2270)
Isodrin	1 (0.454)
Isophorone	5000 (2270)
Isoprene	100 (45.4)
Isopropanolamine DODecylbenzene sulfonate	1000 (454)
Isosafrole	100 (45.4)
3(2H)-Isoxazolone, 5-(aminomethyl)-	1000 (454)
Kepone	1 (0.454)
Lasiocarpine	10 (4.54)
Lead +	10 (4.54)
Lead acetate	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Lead arsenate	1 (0.454)
Lead, bis(acetato-O) tetrahydroxytri	10 (4.54)
Lead chloride	10 (4.54)
Lead fluoborate	10 (4.54)
Lead fluoride	10 (4.54)
Lead iodide	10 (4.54)
Lead nitrate	10 (4.54)
Lead phosphate	10 (4.54)
Lead stearate	10 (4.54)
Lead subacetate	10 (4.54)
Lead sulfate	10 (4.54)
Lead sulfide	10 (4.54)
Lead thiocyanate	10 (4.54)
Lindane	1 (0.454)
Lithium chromate	10 (4.54)
Malathion	100 (45.4)
Maleic acid	5000 (2270)
Maleic anhydride	5000 (2270)
Maleic hydrazide	5000 (2270)
Malononitrile	1000 (454)
MDI	5000 (2270)
Melphalan	1 (0.454)
Mercaptodimethur	10 (4.54)
Mercuric cyanide	1 (0.454)
Mercuric nitrate	10 (4.54)
Mercuric sulfate	10 (4.54)
Mercuric thiocyanate	10 (4.54)
Mercurous nitrate	10 (4.54)
Mercury	1 (0.454)
Mercury, (acetato-O)phenyl-	100 (45.4)
Mercury fulminate	10 (4.54)
Methacrylonitrile	1000 (454)
Methanamine, N-methyl-	1000 (454)
Methanamine, N-methyl-N-nitroso	10 (4.54)
Methane, bromo	1000 (454)
Methane, chloro-	100 (45.4)
Methane, chloromethoxy-	10 (4.54)
Methane, dibromo-	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Methane, dichloro-	1000 (454)
Methane, dichlorodifluoro	5000 (2270)
Methane, iodo-	100 (45.4)
Methane, isocyanato-	10 (4.54)
Methane, oxybis(chloro-	10 (4.54)
Methane, tetrachloro-	10 (4.54)
Methane, tetranitro-	10 (4.54)
Methane, tribromo-	100 (45.4)
Methane, trichloro-	10 (4.54)
Methane, trichlorofluoro-	5000 (2270)
Methanesulfenyl chloride, trichloro-	100 (45.4)
Methanesulfonic acid, ethyl ester	1 (0.454)
Methanethiol	100 (45.4)
6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro -1,5,5a,6,9, 9a-hexahydro-, 3-oxide	1 (0.454)
Methanoic acid	5000 (2270)
4,7-Methano-1H-indene, 1,4,5,6,7,8, 8-heptachloro-a,4,7,7a-tetrahydro-	1 (0.454)
4,7-Methano-1H-indene, 1,4,5,6,7,8, 8-octachloro-2,3,3a,4,7,7a-hexahydro-	1 (0.454)
Methanol	5000 (2270)
Methapyrilene	5000 (2270)
1,3,4-Metheno-2H-cyclobutal[cd]- pentalen-2 -one, 1, 1a, 3, 3a, 4, 5, 5,5a,5b, 6- decachloroctahydro-	1 (0.454)
Methomyl	100 (45.4)
Methoxychlor	1 (0.454)
Methyl alcohol	5000 (2270)
Methylamine *	100 (45.4)
Methyl bromide	1000 (454)
1-Methylbutadiene	100 (45.4)
Methyl chloride	100 (45.4)
Methyl chlorocarbonate	1000 (454)
Methyl chloroform	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Methyl chloroformate	1000 (454)
Methylchloromethyl ether *	1 (0.454)
3-Methylcholanthrene	10 (4.54)
4,4'-Methylenebis(2-chloroaniline)	10 (4.54)
Methylene bromide	1000 (454)
Methylene chloride	1000 (454)
4,4'-Methylenedianiline	10 (4.54)
Methylene diphenyl diisocyanate	5000 (2270)
Methylene oxide	100 (45.4)
Methyl ethyl ketone (MEK)	5000 (2270)
Methyl ethyl ketone peroxide	10 (4.54)
Methyl hydrazine	10 (4.54)
Methyl iodide	100 (45.4)
Methyl isobutyl ketone	5000 (2270)
Methyl isocyanate	1 (0.454)
2-Methyllactonitrile	10 (4.54)
Methyl mercaptan	100 (45.4)
Methyl methacrylate	1000 (454)
Methyl parathion	100 (45.4)
4-Methyl-2-pentanone	5000 (2270)
Methyl tert-butyl ether	1000 (454)
Methylthiouracil	10 (4.54)
Mevinphos	10 (4.54)
Mexacarbate	1000 (454)
Mitomycin C	10 (4.54)
MNNG	10 (4.54)
Monoethylamine	100 (45.4)
Monomethylamine	100 (45.4)
Muscimol	1000 (454)
Naled	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
5,12-Naphthacenedione, 8-acetyl-10-[3-amino-2,3,6-trideoxy-alpha-L-lyxo- hexopyranosyl) oxy]-7,8,9,10-tetrahydro-6,8, 11-trihydroxy-1-methoxy-,(8S-cis)-	10 (4.54)
Naphthalenamine, N,N-bis(2-chloroethyl)-	100 (45.4)
Naphthalene	100 (45.4)
Naphthalene, 2-chloro-	5000 (2270)
1,4-Naphthalenedione	5000 (2270)
2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4, 4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt	10 (4.54)
Naphthenic acid	100 (45.4)
1,4-Naphthoquinone	5000 (2270)
alpha-Naphthylamine	100 (45.4)
beta-Naphthylamine	1 (0.454)
1-Naphthylamine	100 (45.4)
2-Naphthylamine	1 (0.454)
alpha-Naphthylthiourea	100 (45.4)
Nickel +	100 (45.4)
Nickel ammonium sulfate	100 (45.4)
Nickel carbonyl	10 (4.54)
Nickel carbonyl Ni(CO)4,(T-4)-	10 (4.54)
Nickel chloride	100 (45.4)
Nickel cyanide	10 (4.54)
Nickel cyanide Ni(CN)2	10 (4.54)
Nickel hydroxide	10 (4.54)
Nickel nitrate	100 (45.4)
Nickel sulfate	100 (45.4)
Nicotine and salts	100 (45.4)
Nitric acid	1000 (454)
Nitric acid, thallium (1+) salt	100 (45.4)
Nitric oxide	10 (4.54)
p-Nitroaniline	5000 (2270)
Nitrobenzene	1000 (454)
4-nitrobiphenyl	10 (4.54)
Nitrogen dioxide	10 (4.54)
Nitrogen oxide NO	10 (4.54)
Nitrogen oxide NO2	10 (4.54)
Nitroglycerine	10 (4.54)
Nitrophenol (mixed)	100 (45.4)
m-	
o-	
p-	
o-Nitrophenol	100 (45.4)
p-Nitrophenol	100 (45.4)
2-Nitrophenol	100 (45.4)
4-Nitrophenol	100 (45.4)
2-Nitropropane	10 (4.54)
N-Nitrosodi-n-butylamine	10 (4.54)
N-Nitrosodiethanolamine	1 (0.454)
N-Nitrosodiethylamine	1 (0.454)
N-Nitrosodimethylamine	10 (4.54)
N-Nitrosodiphenylamine	100 (45.4)
N-Nitroso-N-ethylurea	1 (0.454)
N-Nitroso-N-methylurea	1 (0.454)
N-Nitroso-N-methylurethane	1 (0.454)
N-Nitrosomethylvinylamine	10 (4.54)
n-Nitrosomorpholine	1 (0.454)
N-Nitrosopiperidine	10 (4.54)
N-Nitrosopyrrolidine	1 (0.454)
Nitrotoluene	1000 (454)
m-Nitrotoluene	
o-Nitrotoluene	
p-Nitrotoluene	
5-Nitro-o-toluidine	100 (45.4)
Octamethylpyrophosphoramide	100 (45.4)
Osmium oxide OsO4 (T-4)-	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Osmium tetroxide	1000 (454)
7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	1000 (454)
1,2-Oxathiolane, 2,2-dioxide	10 (4.54)
2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl) tetrahydro-2-oxide	10 (4.54)
Oxirane	10 (4.54)
Oxiranecarboxyaldehyde	10 (4.54)
Oxirane, (chloromethyl)-	100 (45.4)
Paraformaldehyde	1000 (454)
Paraldehyde	1000 (454)
Parathion	10 (4.54)
Pentachlorobenzene	10 (4.54)
Pentachloroethane	10 (4.54)
Pentachloronitrobenzene (PCNB)	100 (45.4)
Pentachlorophenol	10 (4.54)
1,3-Pentadiene	100 (45.4)
Perchloroethylene	100 (45.4)
Perchloromethyl mercaptan *	100 (45.4)
Phenacetin	100 (45.4)
Phenanthrene	5000 (2270)
Phenol	1000 (454)
Phenol, 2-chloro-	100 (45.4)
Phenol, 4-chloro-3-methyl-	5000 (2270)
Phenol, 2-cyclohexyl-4,6-dinitro-	100 (45.4)
Phenol, 2,4-dichloro-	100 (45.4)
Phenol, 2,6-dichloro-	100 (45.4)
Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)	1 (0.454)
Phenol, 2,4-dimethyl-	100 (45.4)
Phenol, 2,4-dinitro-	10 (4.54)
Phenol, methyl-	100 (45.4)
Phenol, 2-methyl-4,6-dinitro-	10 (4.54)
Phenol, 2,2'-methylenebis [3,4,6-trichloro-	100 (45.4)
Phenol, 2-(1-methylpropyl)-4,6-dinitro	1000 (454)
Phenol, 4-nitro-	100 (45.4)
Phenol, pentachloro-	10 (4.54)
Phenol, 2,3,4,6-tetrachloro-	10 (4.54)
Phenol, 2,4,5-trichloro-	10 (4.54)
Phenol, 2,4,6-trichloro-	10 (4.54)
Phenol, 2,4,6-trinitro-, ammonium salt	10 (4.54)
L-Phenylalanine, 4-[bis(2-chloroethyl)aminol]	1 (0.454)
p-Phenylenedimine	5000 (2270)
1,10-(1,2-Phenylene)pyrene	100 (45.4)
Phenyl mercaptan *	100 (45.4)
Phenylmercuric acetate	100 (45.4)
Phenylthiourea	100 (45.4)
Phorate	10 (4.54)
Phosgene	10 (4.54)
Phosphine	100 (45.4)
Phosphoric acid	5000 (2270)
Phosphoric acid, diethyl 4-nitrophenyl ester	100 (45.4)
Phosphoric acid, lead(2+) salt (2:3)	10 (4.54)
Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio) ethyl]ester	1 (0.454)
Phosphorodithioic acid, O,O-diethyl S-(ethylthio), methyl ester	10 (4.54)
Phosphorodithioic acid, O,O-diethyl S-methyl ester	5000 (2270)
Phosphorodithioic acid, O,O-dimethyl S-[2 (methylamino)-2- oxoethyl] ester	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Phosphorofluoridic acid, bis(1-methylethyl) ester	100 (45.4)
Phosphorothioic acid, O,O-diethyl O- (4-nitrophenyl) ester	10 (4.54)
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	100 (45.4)
Phosphorothioic acid, O, O-dimethyl O-(4-nitrophenyl) ester	100 (45.4)
Phosphorothioic acid, O,[4-[(dimethylamino) sulfonyl phenyl]O,O-dimethyl ester	1000 (454)
Phosphorus	1 (0.454)
Phosphorus oxychloride	1000 (454)
Phosphorus pentasulfide	100 (45.4)
Phosphorus sulfide	100 (45.4)
Phosphorus trichloride	1000 (454)
Phthalic anhydride	5000 (2270)
2-Picoline	5000 (2270)
Piperidine, 1-nitroso-	10 (4.54)
Plumbane, tetraethyl-	10 (4.54)
POLYCHLORINATED BIPHENYLS (PCBs)	1 (0.454)
Potassium arsenate	1 (0.454)
Potassium arsenite	1 (0.454)
Potassium bichromate	10 (4.54)
Potassium chromate	10 (4.54)
Potassium cyanide	10 (4.54)
Potassium cyanide K(CN)	10 (4.54)
Potassium hydroxide	1000 (454)
Potassium permanganate	100 (45.4)
Potassium silver cyanide	1 (0.454)
Pronamide	5000 (2270)
Propanal, 2-methyl-2-(methylthio)-, O- [(methylamino)carbonyl] oxime	1 (0.454)
1-Propanamine	5000 (2270)
1-Propanamine, N-nitroso-N-propyl-	10 (4.54)
1-Propanamine, N-propyl-	5000 (2270)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Propane, 1,2-dibromo-3-chloro-	1 (0.454)
Propane, 1,2-dichloro-	1000 (454)
Propane, 2-nitro-	10 (4.54)
Propane, 2,2'-oxybis [2-chloro-	1000 (454)
1,3-Propane sultone	10 (4.54)
Propanedinitrile	1000 (454)
Propanenitrile	10 (4.54)
Propanenitrile, 3-chloro-	1000 (454)
Propanenitrile, 2-hydroxy-2-methyl-	10 (4.54)
1,2,3-Propanetriol, trinitrate-	10 (4.54)
1-Propanol, 2,3-dibromo-, phosphate (3:1)	10 (4.54)
1-Propanol, 2-methyl-	5000 (2270)
2-Propanone	5000 (2270)
2-Propanone, 1-bromo-	1000 (454)
Propargite	10 (4.54)
Propargyl alcohol	1000 (454)
2-Propenal	1 (0.454)
2-Propenamide	5000 (2270)
1-Propene, 1,3-dichloro-	100 (45.4)
1-Propene, 1,1,2,3,3,3-hexachloro-	1000 (454)
2-Propenenitrile	100 (45.4)
2-Propenenitrile, 2-methyl	1000 (454)
2-Propenoic acid	5000 (2270)
2-Propenoic acid, ethyl ester	1000 (454)
2-Propenoic acid, 2-methyl-, ethyl ester	1000 (454)
2-Propenoic acid, 2-methyl-, methyl ester	1000 (454)
2-Propen-1-ol	100 (45.4)
beta-Propioaldehyde	1000 (454)
Propionic acid	5000 (2270)
Propionic acid, 2-(2,4,5-trichlorophenoxy)-	100 (45.4)
Propionic anhydride	5000 (2270)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Propoxur (baygon)	100 (45.4)
n-Propylamine	5000 (2270)
Propylene dichloride	1000 (454)
Propylene oxide	100 (45.4)
1,2-Propyleimine	1 (0.454)
2-Propyn-1-ol	1000 (454)
Pyrene	5000 (2270)
Pyrethrins	1 (0.454)
3,6-Pyridazinedione, 1,2-dihydro-	5000 (2270)
4-Pyridinamine	1000 (454)
Pyridine	1000 (454)
Pyridine, 2-methyl-	5000 (2270)
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)	100 (45.4)
2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2- chloroethyl)amino]-	10 (4.54)
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	10 (4.54)
Pyrrolidine, 1-nitroso-	1 (0.454)
Quinoline	5000 (2270)
Reserpine	5000 (2270)
Resorcinol	5000 (2270)
Saccharin and salts	100 (45.4)
Safrole	100 (45.4)
Selenious acid	10 (4.54)
Selenious acid, dithallium(1+) salt	1000 (454)
Selenium +	100 (45.4)
Selenium dioxide	10 (4.54)
Selenium oxide	10 (4.54)
Selenium sulfide	10 (4.54)
Selenium sulfide SeS2	10 (4.54)
Selenourea	1000 (454)
L-Serine, diazoacetate (ester)	1 (0.454)
Silver	1000 (454)
Silver cyanide	1 (0.454)
Silver cyanide Ag(CN)	1 (0.454)
Silver nitrate	1 (0.454)
Silvex (2,4,5-TP)	100 (45.4)
Sodium	10 (4.54)
Sodium arsenate	1 (0.454)
Sodium arsenite	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Sodium azide	1000 (454)
Sodium bichromate	10 (4.54)
Sodium bifluoride	100 (45.4)
Sodium bisulfite	5000 (2270)
Sodium chromate	10 (4.54)
Sodium cyanide	10 (4.54)
Sodium cyanide Na(CN)	10 (4.54)
Sodium DODecylbenzene sulfonate	1000 (454)
Sodium fluoride	1000 (454)
Sodium hydrosulfide	5000 (2270)
Sodium hydroxide	1000 (454)
Sodium hypochlorite	100 (45.4)
Sodium methylate	1000 (454)
Sodium nitrite	100 (45.4)
Sodium phosphate, dibasic	5000 (2270)
Sodium phosphate, tribasic	5000 (2270)
Sodium selenite	100 (45.4)
Streptozotocin	1 (0.454)
Strontium chromate	10 (4.54)
Strychnidin-10-one	10 (4.54)
Strychnidin-10-one, 2,3-dimethoxy-	100 (45.4)
Strychnine and salts	10 (4.54)
Styrene	1000 (454)
Styrene oxide	100 (45.4)
Sulfur chloride *	1000 (454)
Sulfur monochloride	1000 (454)
Sulfur phosphide	100 (45.4)
Sulfuric acid	1000 (454)
Sulfuric acid, dimethyl ester	100 (45.4)
Sulfuric acid, dithallium(I+) salt	100 (45.4)
2,4,5-T	1000 (454)
2,4,5-T acid	1000 (454)
2,4,5-T amines	5000 (2270)
2,4,5-T esters	1000 (454)
2,4,5-T salts	1000 (454)
TDE	1 (0.454)
1,2,4,5-Tetrachlorobenzene	5000 (2270)
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
1,1,1,2-Tetrachloroethane	100 (45.4)
1,1,2,2-Tetrachloroethane	100 (45.4)
Tetrachloroethane *	100 (45.4)
Tetrachloroethene	100 (45.4)
Tetrachloroethylene	100 (45.4)
2,3,4,6-Tetrachlorophenol	10 (4.54)
Tetraethyl lead	10 (4.54)
Tetraethyl pyrophosphate	10 (4.54)
Tetraethyldithiopyrophosphate	100 (45.4)
Tetrahydrofuran	1000 (454)
Tetranitromethane	10 (4.54)
Tetraphosphoric acid, hexaethyl ester	100 (45.4)
Thallic oxide	100 (45.4)
Thallium +	1000 (454)
Thallium(I) acetate	100 (45.4)
Thallium(I) carbonate	100 (45.4)
Thallium(I) chloride	100 (45.4)
Thallium chloride TICI	100 (45.4)
Thallium(I) nitrate	100 (45.4)
Thallium oxide T1203	100 (45.4)
Thallium selenite	1000 (454)
Thallium(I) sulfate	100 (45.4)
Thioacetamide	10 (4.54)
Thiodiphosphoric acid, tetraethyl ester	100 (45.4)
Thiofanox	100 (45.4)
ThioimiDODicarbonic diamide [(H2N)C(S)]2NH	100 (45.4)
Thiomethanol	100 (45.4)
Thioperoxydicarbonic diamide [(H2N)C(S)]2S2, tetramethyl-	10 (4.54)
Thiophenol	100 (45.4)
Thiosemicarbazide	100 (45.4)
Thiourea	10 (4.54)
Thiourea, (2-chlorophenyl)-	100 (45.4)
Thiourea, 1-naphthalenyl-	100 (45.4)
Thiourea, phenyl-	100 (45.4)
Thiram	10 (4.54)
Titanium tetrachloride	1000 (454)
Toluene	1000 (454)
Toluenediamine	10 (4.54)
Toluene diisocyanate	100 (45.4)
o-Toluidine	100 (45.4)
p-Toluidine	100 (45.4)
o-Toluidine hydrochloride	100 (45.4)
Toxaphene	1 (0.454)
2,4,5-TP acid	100 (45.4)
2,4,5-TP acid esters	100 (45.4)
1H-1,2,4-Triazol-3-amine	10 (4.54)
Trichlorfon	100 (45.4)
1,2,4-Trichlorobenzene	100 (45.4)
1,1,1-Trichloroethane	1000 (454)
1,1,2-Trichloroethane	100 (45.4)
Trichloroethene	100 (45.4)
Trichloroethylene	100 (45.4)
Trichloromethanesulfenyl chloride	100 (45.4)
Trichloromonofluoromethane	5000 (2270)
Trichlorophenol	10 (4.54)
2,3,4-Trichlorophenol	
2,3,5-Trichlorophenol	
2,3,6-Trichlorophenol	
2,4,5-Trichlorophenol	
2,4,6-Trichlorophenol	
3,4,5-Trichlorophenol	
2,4,5-Trichlorophenol	10 (4.54)
2,4,6-Trichlorophenol	10 (4.54)
Triethanolamine DODecylbenzene sulfonate	1000 (45.4)
Triethylamine	5000 (2270)
Trifluralin	10 (4.54)
Trimethylamine	100 (45.4)
2,2,4-Trimethylpentane	1000 (454)
1,3,5-Trinitrobenzene	10 (4.54)
1,3,5-Trioxane, 2,4,6-trimethyl-	1000 (45.4)
Tris(2,3-dibromopropyl) phosphate	10 (4.54)
Trypan blue	10 (4.54)
Uracil mustard	10 (4.54)
Uranyl acetate	100 (45.4)
Uranyl nitrate	100 (45.4)
Urea, N-ethyl-N-nitroso-	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Urea, N-methyl-N-nitroso-	1 (0.454)
Vanadic acid, ammonium salt	1000 (454)
Vanadium oxide V205	1000 (454)
Vanadium pentoxide	1000 (454)
Vanadyl sulfate	1000 (454)
Vinyl acetate	5000 (2270)
Vinyl acetate monomer	5000 (2270)
Vinylamine, N-methyl-N-nitroso-	10 (4.54)
Vinyl bromide	100 (45.4)
Vinyl chloride	1 (0.454)
Vinylidene chloride	100 (45.4)
Warfarin, & salts, when present at concentrations greater than 0.3%	100 (45.4)
Xylene	100 (45.4)
m-Xylene	1000 (454)
o-Xylene	1000 (454)
p-Xylene	100 (45.4)
Xylene (mixed)	100 (45.4)
Xylenes (isomers and mixture)	100 (45.4)
Xylenol	1000 (454)
Yohimban-16-carboxylic acid, 11, 17-dimethoxy-18-[(3,4,5- trimethoxybenzoyl) oxy]-, methyl ester(3beta, 16beta, 17alpha, 18beta, 20alpha)-	5000 (2270)
Zinc +	1000 (454)
Zinc acetate	1000 (454)
Zinc ammonium chloride	1000 (454)
Zinc borate	1000 (454)
Zinc bromide	1000 (454)
Zinc carbonate	1000 (454)
Zinc chloride	1000 (454)
Zinc cyanide	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Zinc cyanide Zn(CN)2	10 (4.54)
Zinc fluoride	1000 (454)
Zinc formate	1000 (454)
Zinc hydrosulfite	1000 (454)
Zinc nitrate	1000 (454)
Zinc phenolsulfonate	5000 (2270)
Zinc phosphide	100 (45.4)
Zinc phosphide Zn3P2, when present at concentrations greater than 10%	100 (45.4)
Zinc silicofluoride	5000 (2270)
Zinc sulfate	1000 (454)
Zirconium nitrate	5000 (2270)
Zirconium potassium fluoride	1000 (454)
Zirconium sulfate	5000 (2270)
Zirconium tetrachloride	5000 (2270)
D001 Unlisted Hazardous Wastes Characteristic of Ignitability	100 (45.4)
D002 Unlisted Hazardous Wastes Characteristic of Corrosivity	100 (45.4)
D003 Unlisted Hazardous Wastes Characteristic of Reactivity	100 (45.4)
D004 - D043 Specific Hazardous Wastes with Toxicity Characteristics	
D004 Arsenic	1 (0.454)
D005 Barium	1000 (454)
D006 Cadmium	10 (4.54)
D007 Chromium	10 (4.54)
D008 Lead	10 (4.54)
D009 Mercury	1 (0.454)
D010 Selenium	10 (4.54)
D011 Silver	1 (0.454)
D012 Endrin	1 (0.454)
D013 Lindane	1 (0.454)
D014 Methoxychlor	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
D015 Toxaphene	1 (0.454)
D016 2,4-D	100 (45.4)
D017 2,4,5-TP (Silvex)	100 (45.4)
D018 Benzene	10 (4.54)
D019 Carbon tetrachloride	10 (4.54)
D020 Chlordane	1 (0.454)
D021 Chlorobenzene	100 (45.4)
D022 Chloroform	10 (4.54)
D023 o-Cresol	100 (45.4)
D024 m-Cresol	100 (45.4)
D025 p-Cresol	100 (45.4)
D026 Cresol	100 (45.4)
D027 1,4-Dichlorobenzene	100 (45.4)
D028 1,2-Dichloroethane	100 (45.4)
D029 1,1-Dichloroethylene	100 (45.4)
D030 2,4-Dinitrotoluene	10 (4.54)
D031 Heptachlor (and hydroxide)	1 (0.454)
D032 Hexachlorobenzene	10 (4.54)
D033 Hexachlorobutadiene	1 (0.454)
D034 Hexachloroethane	100 (45.4)
D035 Methyl ethyl ketone	5000 (2270)
D036 Nitrobenzene	1000 (454)
D037 Pentachlorophenol	10 (4.54)
D038 Pyridine	1000 (454)
D039 Tetrachloroethylene	100 (45.4)
D040 Tricholorethylene	100 (45.4)
D041 2,4,5-Trichlorophenol	10 (4.54)
D042 2,4,6-Trichlorophenol	10 (4.54)
D043 Vinyl chloride	1 (0.454)
F001	10 (4.54)
The following spent halogenated solvents used in degreasing; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more, (by volume) of one or more of the below listed halogenated solvents or those solvents listed in F002, F004 and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	
(a) Tetrachloroethylene	100 (45.4)
(b) Trichloroethylene	100 (45.4)
(c) Methylene chloride	1000 (454)
(d) 1,1,1-Trichloroethane	1000 (454)
(e) Carbon tetrachloride	10 (45.4)
(f) Chlorinated fluorocarbons	5000 (2270)
F002	10 (45.4)
The following spent halogenated solvents; all spent solvent mixtures/ blends containing, before use, a total of ten percent or more (by volume) of one or more of the below listed halogenated solvents or those listed in F001, F004, F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	
(a) Tetrachloroethylene	100 (45.4)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
(b) Methylene chloride	1000 (454)
(c) Trichloroethylene	100 (45.4)
(d) 1,1,1-Trichloroethane	1000 (454)
(e) Chlorobenzene	100 (45.4)
(f) 1,1,2-Trichloro-1,2,2-trifluoroethane	5000 (2270)
(g) o-Dichlorobenzene	100 (45.4)
(h) Trichlorofluoromethane	5000 (2270)
(i) 1,1,2 Trichloroethane	100 (45.4)
F003	100 (45.4)
The following spent non-halogenated solvents and solvents:	
(a) Xylene	1000 (454)
(b) Acetone	5000 (2270)
(c) Ethyl acetate	5000 (2270)
(d) Ethylbenzene	1000 (454)
(e) Ethyl ether	100 (45.4)
(f) Methyl isobutyl ketone	5000 (2270)
(g) n-Butyl alcohol	5000 (2270)
(h) Cyclohexanone	5000 (2270)
(i) Methanol	5000 (2270)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
F004	100 (45.4)
The following spent non-halogenated solvents and the stillbottoms from the recovery of these solvents	
(a) Cresols/Cresylic acid	1000 (454)
(b) Nitrobenzene	100 (45.4)
F005	100 (45.4)
The following spent non-halogenated solvents and the stillbottoms from the recovery of these solvents:	
(a) Toluene	1000 (454)
(b) Methyl ethyl ketone	5000 (2270)
(c) Carbon disulfide	100 (45.4)
(d) Isobutanol	5000 (2270)
(e) Pyridine	1000 (454)
F006	10 (4.54)
Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum,(2) tin plating on carbon steel, (3) zinc plating (segregated basis) on carbon steel, (4) aluminum or zinc-aluminum plating on carbon steel, (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel, and (6) chemical etching and milling of aluminum.	
F007	10 (4.54)
Spent cyanide plating bath solutions from electroplating operations.	
F008	10 (4.54)
Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
F009	10 (4.54)
Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	
F010	10 (4.54)
Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	
F011	10 (4.54)
Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations (except for precious metals heat treating spent cyanide solutions from salt bath pot cleaning).	
F012	10 (4.54)
Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.	
F019	10 (4.54)
Wastewater treatment sludges from the chemical conversion coating of aluminum-- except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process.	
F020	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in formulating process) of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of hexachlorophene from highly purified 2,4,5,- trichlorophenol.	
F021	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.	
F022	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions	
F023	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of hexachlorophene from highly purified 2,4,5-trichlorophenol.).	
F024	1 (0.454)
Wastes, including but not limited to distillation residues, heavy ends, tars, and reactor cleanout wastes, from the production of chlorinated aliphatichydrocarbons, having carbon content from one to five, utilizing free radical catalyzed processes. (This listing does not include light ends, spent filters and filter aids, spent dessicants(sic), wastewater, wastewater treatment sludges, spent catalysts, and wastes listed in 40 CFR 261.32.).	

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
F025	1 (0.454)
Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic with varying amounts and positions of with varying amounts and positions of chlorine substitution.	
F026	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions.	
F027	1 (0.454)
Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.).	
Footnotes:	
+ The RQ for these hazardous substances is limited to those pieces of metal having a diameter smaller than 100 micrometer (0.004 inches)	
++ The RQ for asbestos is limited to	
friable forms only	
*** Indicates that the name was added by DOT because (1) the name is a synonym for a specific hazardous substance for a specific hazardous substance and (2) the name appears in the Hazardous Materials Table as a proper shipping name.**	

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
F028	1 (0.454)
Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027.	
F032	1 (0.454)
F034	1 (0.454)
F035	1 (0.454)
F037	1 (0.454)
F038	1 (0.454)
F039	1 (0.454)

Attachment 5

CLASS 1--EXPLOSIVES AND AMMUNITION

A5.1. General Requirements. This attachment contains information concerning packaging and general handling instructions for Class 1 material. See **Attachment 3** for additional information concerning Class 1 material.

A5.2. Installed Explosive Devices. Remove installed explosive devices from aircraft systems unless removal is not required according to a technical directive or the directive identifies the explosives are permanently imbedded in the system. When installation is authorized, comply with the technical directive and the following requirements:

A5.2.1. The safety devices must be in place and secured to the maximum extent possible (including blocking or banding when advantageous) to prevent arming.

A5.2.2. The aircraft system's packaging must provide reasonable security against tampering with the installed explosive items or the arming systems.

A5.2.3. Mark items according to **Attachment 14**.

A5.2.4. Complete Shipper’s Declaration for Dangerous Goods according to **Attachment 17**.

A5.3. Unpackaged Explosives. Unless otherwise authorized in this manual, package all explosives according to **Attachment 5**. Explosives may only be removed from their required packaging to meet operational requirements of **Chapter 3** under the following circumstances:

A5.3.1. On airdrop parachute platforms configured according to TO 13C7/FM 10-500 series publications.

A5.3.2. When stored in approved racks or containers, or secured in/on tactical equipment or vehicles as operational components according to technical orders or publications.

A5.3.3. When secured/restrained in freight containers according to service drawings approved for air movement.

A5.4. Items requiring Special Approval. Ship according to a Special Approval (includes CAA or COE) issued for the particular item. See paragraphs **2.5.** and **2.6.** for more information on CAAs and COEs. Comply with the following handling instructions only when shipping items containing a fuel that is corrosive or toxic.

A5.4.1. Handling Instructions. Exercise extreme caution in handling this item. Keep well ventilated, away from sparks, fire hazards, and oxidizing materials. Vapors are toxic when inhaled. Liquid is corrosive. Fuel in presence of an oxidizer is self-igniting and highly reactive. Personnel exposed to this material must wear protective clothing, gloves, safety goggles, and must use a positive pressure breathing apparatus.

A5.4.2. Shipping Requirements. The following requirements apply:

A5.4.2.1. Load containers having an installed indicator in such a manner as to provide access to the indicator during flight. Inspect the indicator before aircraft loading, after aircraft loading, at cruise altitude, during flight every hour or as required by the applicable technical manual, as cargo

tiedown is inspected, and after landing. The normal color of the indicator is white or off-white. The color will change to yellow if inhibited red fuming nitric acid (IRFNA) leak occurs. The color will change to black if an amine fuel mixture (AFM) leak occurs. Changes are obvious and do not require technical escort personnel to monitor.

A5.4.2.2. Containers that do not have an indicator installed must be preplanned under the same conditions as described in paragraph **2.8.** The shipper must contact the carrier no less than 72 hours before movement. The shipper must also furnish the following:

A5.4.2.3. Protective clothing, gloves, and a positive pressure breathing apparatus for all personnel aboard the aircraft (see also paragraph **1.12.**).

A5.4.2.4. Fume-detecting equipment.

A5.4.2.5. A qualified technical escort or courier with equipment to monitor the item for leaks and is prepared to take emergency in-flight action.

A5.4.3. Emergency Procedures. When a leak is detected, either by observation of the indicator or by monitoring equipment:

A5.4.3.1. Get personnel out of the cargo compartment.

A5.4.3.2. Alert pilot and crew.

A5.4.3.3. Depressurize cargo compartment and ventilate as soon as possible.

A5.4.3.4. All personnel should go on 100 percent oxygen.

A5.4.3.5. Declare an in-flight emergency.

A5.4.3.6. Be prepared to jettison cargo if possible.

A5.4.3.7. Descend and land as soon as possible.

A5.4.3.8. Aircraft must be parked in an isolated area.

A5.4.3.9. Aircraft must be unloaded by EOD personnel as soon as possible.

A5.5. Barium Azide; Barium Styphnate; Diazodinitrophenol, Wetted; Guanyl Nitrosaminoguanylidene Hydrazine, Wetted; Guanyl Nitrosaminoguanyltetrazene, Wetted; Tetrazene, Wetted; Lead Azide, Wetted; Lead Mononitroresorcinate; Lead Styphnate, Wetted; Lead Trinitroresorcinate, Wetted; and Mercury Fulminate, Wetted, must be packaged as follows:

A5.5.1. Fill the intermediate and outer packagings with an appropriate water-saturated material. The outer drum must have a watertight seal (except UN0224 when shipped dry). Package in drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: plastic textile, plastic coated or lined rubber textile, or rubberized textile	Bags: plastic textile, plastic coated or lined rubber textile, or rubberized textile bag *or* Receptacles: plastic or metal	Drums: removable head steel (1A2) or removable head plastic (1H2)

A5.5.2. Inner packagings must not contain more than 50 g of explosive substance (quantity corresponding to dry substance); separate inner packagings from each other with dividing partitions; and do not partition within the outer packaging with more than 25 compartments. Package in boxes as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: conductive rubber or plastic *or* Receptacles: conductive rubber or plastic, metal, or wood	Dividing partitions: metal, wood, plastic, or fiberboard	Boxes: natural wood, sift-proof wall (4C2), plywood (4D), or reconstituted wood (4F)

A5.6. Powder Cake or Powder Paste, Wetted; or Nitrocellulose Plasticized. Inner packagings are not required for UN0159 when metal (1A2 or 1B2) or plastic (1H2) drums are used as the outer packaging.

A5.6.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: waterproof paper, plastic, or rubberized textile *or* Sheets: plastic or rubberized textile	Boxes: steel (4A), aluminum (4B), fiberboard (4G), ordinary wood (4C1), natural sift-proof wood (4C2), plywood (4D), reconstituted wood (4F), expanded plastic (4H1), or solid plastic (4H2)

A5.6.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: waterproof paper, plastic, or rubberized textile *or* Sheets: plastic or rubberized textile	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), or fiberboard (1G)

A5.7. Ammonium Picrate; Cyclotetramethylenetetranitramine, HMX, or Octogen Wetted; Cyclotrimethylenetrinitramine and Octogen, Mixtures, Wetted or Desensitized; Cyclotrimethylenetrinitramine, Cyclonite, Hexogen, or RDX Wetted; Cyclotrimethylenetrinitramine and Cyclotetramethylenetetranitramine, Mixtures, Wetted or Desensitized; Cyclotrimethylenetrinitramine and HMX Mixtures, Wetted or Desensitized; Dinitrophenol; Dinitroresorcinol; Dipicryl Sulfide; Hexolite or Hexotol; Hexotonal; Mannitol Hexanitrate or Nitromannite, Wetted; Nitrocellulose; Nitrostarch; Nitro Urea; Nitroguanidine or Picrite Trinitrophenol or Picric Acid; Octolite or Octol; Pentolite; Pentaerythrite Tetranitrate or Pentaerythritol Tetranitrate or PETN, Wetted; or Pentaerythrite Tetranitrate or Pentaerythritol Tetranitrate or PETN,

Desensitized; RDX and Cyclotetramethylenetetranitramine, Wetted or Desensitized; Trinitrobenzene; Trinitrobenzoic Acid; Trinitroresorcinol or Styphnic Acid; Trinitroresorcinol, Wetted; Trinitrotoluene or TNT Tritonal; RDX and HMX Mixtures, Wetted or Desensitized Urea Nitrate. Packaging must be lead free for UN 0004, 0076, 0078, 0154, 0216, 0219, 0386, and 0394.

A5.7.1. Wetted Solids. Package in drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: multiwall water resistant paper, plastic, textile, rubberized textile, woven plastic *or* Receptacles: metal or plastic	Bags: plastics, plastic coated or lined textile *or* Receptacles: metal or plastic ***NOTE:*** Intermediate packaging not required for UN0072 and UN 00226 or if leakproof drums are used as outer packaging	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.7.2. Dry Solids Other Than Powders. Package in bags as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic ***NOTE:*** Inner packaging not required for UN0222 and UN0223	Bags (required for UN 0150 only): plastics, plastic coated or lined textile	Bags: sift-proof woven plastic (5H2/3), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3), multiwall water resistant paper (5M2)

A5.7.3. Dry Solids Other Than Powders. Package in boxes as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic ***NOTE:*** Inner packaging not required for UN0222 and UN0223	Bags (required for UN 0150 only): plastics, plastic coated or lined textile	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2)

A5.7.4. Dry Solids Other Than Powders. Package in drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic. ***NOTE:*** Inner packaging not required for UN0222 and UN0223	Bags (required for UN 0150 only): plastics, plastic coated or lined textile	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2)

A5.7.5. Solid Dry Powders. Package in boxes as follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging
Bags: multiwall water resistant paper, plastic, woven plastic *or* Receptacles: fiberboard, metal, plastic, wood	Bags: multiwall water resistant paper with inner lining plastic *or* Receptacles: metal or plastic	Boxes: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.7.6. Solid Dry Powders. Package in drums as follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging
Not required	Bags: multiwall water resistant paper with inner lining plastic *or* Receptacles: metal or plastic	Drums: removable head steel (1A2), removable head aluminum (1B2), fiber (1G)

A5.8. Ammonium Nitrate; Ammonium Perchlorate; Cyclotetramethylenetetranitramine, Octogen, or HMX Desensitized; Cyclotrimethylenetrinitramine, Cyclonite, Hexogen, or RDX Desensitized; Dinitroglycoluril or Dingu; Octonal; Tetranitroaniline; Trinitro-Meta-Cresol; Trinitroaniline or Picramide; Trinitroanisole; Trinitrobenzenesulfonic Acid; Trinitrochlorobenzene or Picryl Chloride; Trinitrofluorenone; Trinitronaphthalene; Trinitrophenetole; Trinitrotoluene and Trinitrobenzene Mixtures or TNT and Trinitrobenzene Mixtures or TNT and Hexannitrostilbene Mixtures or

Trinitrotoluene and Hexanitrostilnene Mixtures; Trinitrotoluene Mixtures Containing Trinitrobenzene and Hexanitrostilbene or TNT Mixtures containing Trinitrobenzene and Hexanitrostilbene must be packaged as follows. Packaging must be lead free for UN 0004, 0076, 0078, 0154, 0216, 0219, and 0386.

A5.8.1. Dry Solids Other Than Powders. Package in bags as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic ***NOTE:*** Inner packaging not required for UN0222 and UN0223	Bags (required for UN 0150 only): plastics, plastic coated or lined textile	Bags: sift-proof woven plastic (5H2/3), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3), multiwall water resistant paper (5M2)

A5.8.2. Dry Solids Other Than Powders. Package in boxes as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic ***NOTE:*** Inner packaging not required for UN0222 and UN0223	Bags (required for UN 0150 only): plastics, plastic coated or lined textile	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2)

A5.8.3. Dry Solids Other Than Powders. Package in drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic ***NOTE:*** Inner packaging not required for UN0222 and UN0223	Bags (required for UN 0150 only): plastics, plastic coated or lined textile	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2)

A5.8.4. Solid Dry Powders. Package in boxes as follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging
Bags: multiwall water resistant paper, plastic, woven plastic *or* Receptacles: fiberboard, metal, plastic, wood	Bags: multiwall water resistant paper with inner lining plastic *or* Receptacles: metal or plastic	Boxes: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.8.5. Solid Dry Powders. Package in drums as follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging
Not required	Bags: multiwall water resistant paper with inner lining plastic *or* Receptacles: metal or plastic	Drums: removable head steel (1A2), removable head aluminum (1B2), fiber (1G)

A5.9. Black Powder or Gunpowder; Black Powder, Compressed or Gunpowder, Compressed; Black Powder, in Pellets or Gunpowder, in Pellets, Flash Powder must be packaged as follows. At least one of the packagings must be sift-proof. Do not package more than 50 g (1.8 oz) of flash powder (UN0094 or UN0305) in each inner packaging.

A5.9.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: paper, plastic, or rubberized textile *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: Kraft paper or waxed paper (only authorized for UN0028)	Boxes: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.9.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: paper, plastic, or rubberized textile *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: Kraft paper or waxed paper (only authorized for UN0028) ***NOTE:*** Inner packaging not required for UN0027	Drums: removable head steel (1A2), removable head aluminum (1B2), fiber (1G) ***NOTE:*** Inner packaging not required for UN0027

A5.10. Deflagrating Metal Salts of Aromatic Nitroderivatives, N.O.S.; Dinitrophenolates; Dinitrosobenzene; Nitrocellulose, Wetted; 5-Mercaptotetrazol-1-Acetic Acid; Tetrazol-1-Acetic Acid; Powder, Smokeless; Propellant, Solid; Sodium Dinitro-O-Cresolate; Sodium Picramate; and Zirconium Picramate must be packaged as follows. Packagings must be lead free for UN0077, 0132, 0234, 0235 and 0236. Use paragraph **A5.10.1.** or **A5.10.2.** for UN0342. Use paragraph **A5.10.3.** or **A5.10.4.** for UN0132, 0160, UN0161, 0406, 0497, 0448, 0498, and 0499.

A5.10.1. Wetted Solids. Package in boxes as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: plastic, textile, woven plastic *or* Receptacles: metal or plastic	Bags: plastic, plastic coated or lined textile *or* Receptacles: metal or plastic	Boxes: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.10.2. Wetted Solids. Package in drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: plastic, textile, woven plastic *or* Receptacles: metal or plastic ***NOTE:*** Inner packaging not required for UN0342 when packed in outer 1A2, 1B2, or 1H2 drum	Bags: plastic, plastic coated or lined textile *or* Receptacles: metal or plastic ***NOTE:*** Intermediate packaging not required if packed in outer leakproof removable head drum	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G)

A5.10.3. Dry Solids. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: kraft paper, plastic, sift-proof woven plastic or textile *or* Receptacles: fiberboard, metal, paper, plastic	Boxes: ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G)

A5.10.4. Dry Solids. Package in drums as follows:

Inner packaging	Outer packaging
Bags: kraft paper, plastic, sift-proof woven plastic or textile *or* Receptacles: fiberboard, metal, paper, plastic ***NOTE:*** Inner packaging not required for UN0160 and 0161 when packed in outer 1A2 or 1B2 drum	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G) ***NOTE:*** For UN0160 and 0161, 1A2 and 1B2 drums must be constructed so that risk of explosion caused by increased internal pressure (from internal or external causes) is prevented

A5.11. Nitroglycerin, Desensitized; Nitroglycerin, Solution in Alcohol; and Propellant, Liquid must be packaged as follows. For liquid explosives, surround each inner packaging with sufficient amount of non-combustible absorbent cushioning material to absorb the entire contents. Cushion metal receptacles from each other in all directions. Liquid substances must not freeze at temperatures above 15 degrees C (5 degrees F). A composite packaging consisting of a plastic receptacle in a metal drum (6HA1) may be used instead of the inner and intermediate packagings.

A5.11.1. Package in boxes as follows. Maximum net mass must not exceed 30 kg.

Inner packaging	Intermediate packaging	Outer packaging
Receptacles: metal or plastic ***NOTE:*** Tape screw cap closures and do not exceed 5 liters capacity each (does not apply to UN 0144)	Bags: plastic in metal receptacles *or* Drums: metal ***NOTE:*** Intermediate packaging not required for UN0144	Boxes: ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G)

A5.11.2. Package in drums as follows. Maximum net volume must not exceed 120 liters.

Inner packaging	Intermediate packaging	Outer packaging
Receptacles: metal or plastic	Bags: plastic in metal receptacles *or* Drums: metal ***NOTE:*** Intermediate packaging not required for UN0144	Drums: removable head steel (1A2), removable head aluminum (1B2), plywood (1D), fiber (1G)

A5.12. Ammonium Nitrate-Fuel Oil Mixture; Explosive, Blasting, Type A (UN 0081); Explosive, Blasting, Type B (UN 0082); and Explosive, Blasting, Type E (UN 0241); Explosive, Blasting, Type B (UN 0331) or Agent Blasting, Type B; Explosive, Blasting, Type C (UN 0083); Explosive, Blasting, Type D (UN 0084) and Explosive, Blasting, Type E (UN 0332) must be packaged as follows. Inner packaging is not required for UN 0082, 0241, 0331, and 0332 when the explosive is contained in a material impervious to liquid.

A5.12.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: water and oil resistant paper, plastic, plastic coated or lined textile, sift-proof woven plastic *or* Receptacles: water resistant fiberboard, metal, plastic, sift-proof wood *or* Sheets: water resistant paper, waxed paper, plastic	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.12.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: water and oil resistant paper, plastic, plastic coated or lined textile, sift-proof woven plastic *or* Receptacles: water resistant fiberboard, metal, plastic, sift-proof wood *or* Sheets: water resistant paper, waxed paper, plastic ***NOTE:*** Inner packaging not required for UN 0082, 0241, 0331, and 0332 if outer drum is leakproof	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2)

A5.12.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Bags: water and oil resistant paper, plastic, plastic coated or lined textile, sift-proof woven plastic *or* Receptacles: water resistant fiberboard, metal, plastic, sift-proof wood *or* Sheets: water resistant paper, waxed paper, plastic	Jerricans: removable head steel (3A2), removable head plastic (3H2)

A5.12.4. Package in bags as follows:

Inner packaging	Outer packaging
Bags: water and oil resistant paper, plastic, plastic coated or lined textile, sift-proof woven plastic *or* Receptacles: water resistant fiberboard, metal, plastic, sift-proof wood *or* Sheets: water resistant paper, waxed paper, plastic ***NOTE:*** Inner packaging not required for UN 0331 when 5H2, 5H3 or 5H4 bags are outer packaging	Bags: woven plastic (5H1/2/3), multiwall water resistant paper (5M2), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3) ***NOTES:*** 5H2 or 5H3 bags only authorized for UN 0082, 0241, 0331, and 0332 Do not use for UN 0081

A5.13. Ammunition, Illuminating; Ammunition, Incendiary; Ammunition, Incendiary, White Phosphorus; Ammunition, Practice; Ammunition, Proof; Ammunition, Smoke; Ammunition, Smoke, White Phosphorus; Ammunition, Tear-Producing; Bombs; Bombs, Photo-Flash; Cartridges, Depth; Cartridges for Weapons; Cartridges for Weapons, Blank; Cartridges for Weapons, Inert Projectile; Cartridges, Small Arms; Cartridges, Small Arms, Blank; Charges, Bursting, Charges, Demolition; Plastic Bonded; Charges, Propelling for Cannon; Mines; Projectiles; Rocket Motors; Rockets; Rockets, Line-Throwing; Torpedoes; Warheads, Rocket; and Warheads, Torpedo must be packaged as follows:

A5.13.1. Package in boxes as follows:

Inner packaging	Outer packaging
Inner packaging not required	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2)

A5.13.2. Package in drums as follows:

Inner packaging	Outer packaging
Inner packaging not required	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.13.3. Large and Robust Articles must be packaged as follows. Large and robust articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked provided that a negative result was obtained in Test Series 4 of the UN Manual of Tests and Criteria on an unpackaged article. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of transport. Such articles may be in DOD-approved containers, crates, cradles, or other suitable handling, storage, or launching devices which have been tested to show that they will not become loose during normal conditions of transport.

A5.14. Detonators, Electric must be packaged as follows: Inner packagings is not required when detonators are packed in pasteboard tubes, or when their leg wires are wound on spools with the caps either placed inside the spool or securely taped to the wire on the spool restricting movement of the caps and protecting from impact.

A5.14.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic *or* Reels	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G)

A5.14.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic *or* Reels	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.15. Detonators, Non-electric and Detonator Assemblies, Non-electric must be packaged as follows: For detonators assemblies (UN 0360, 0361, 0500), detonators are not required to be attached to the safety fuse, metal clad mild detonating cord, detonating cord, or shock tube. Inner packagings are not required if the packing configuration restricts free movement of the caps and protects them from impact forces. For UN 0029, 0267, and 0455, bags and reels may not be used as inner packagings.

A5.15.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic *or* Reels	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G)

A5.15.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic *or* Reels	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.16. Boosters and Charges, Supplementary Explosive must be packaged as follows:

A5.16.1. Package in boxes as follows:

Inner packaging	Outer packaging
Inner packaging not required	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.16.2. Package in combination packages as follows:

Inner packaging	Outer packaging
Receptacles: fiberboard, metal, plastic *or* Sheets: paper, plastic	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.17. Boosters with Detonator; Bursters; Detonators for Ammunition; Grenades, Empty Primed; Primers, Cap Type; Primers, Tubular; and Tracers for Ammunition must be packaged in boxes as follows:

Inner packaging	Intermediate packaging	Outer packaging
Receptacles: fiberboard, metal, plastic, wood *or* Trays (fitted with dividing partitions): fiberboard, plastics, wood. Do not use trays for UN 0043, 0212, 0225, 0268 or 0306.	Receptacles: fiberboard, metal, plastic, wood. ***NOTE:*** Intermediate packaging only required when trays are used as inner packaging.	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.18. Cutters, Cable, Explosive; Cartridges, Power Device; Cartridges, Oil Well; Fracturing Devices, Explosive; Release Devices, Explosive; Rivets, Explosive; and Sounding Devices, Explosive must be packaged as follows:

A5.18.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: water resistant material *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: fiberboard corrugated *or* Tubes: fiberboard	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics

A5.18.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: water resistant material *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: fiberboard corrugated *or* Tubes: fiberboard	Drums: removable head steel (1A2), removable head aluminum (1B2)

A5.19. Air Bag Inflators; Air Bag Modules; Articles, Pyrotechnic; Cartridges, Flash; Cartridges, Signal; Fireworks; Flares, Aerial; Flares, Surface; Seat-Belt Pretensioners; Signal Devices, Hand; Signals, Distress; Signals, Smoke; and Signals, Railway Track, Explosive must be packaged as follows:

A5.19.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: paper, plastic	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastics (4H1), and solid plastics (4H2)

A5.19.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: paper, plastic	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.20. Cases, Cartridge, Empty with Primer and Cases, Combustible, Empty, without Primer must be packaged as follows:

A5.20.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: plastic, textile *or* Boxes: fiberboard, plastic, wood *or* Dividing partitions within outer packaging	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.20.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: plastic, textile *or* Boxes: fiberboard, plastic, wood *or* Dividing partitions within outer packaging	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.21. Charges, Shaped or Explosive, Commercial must be packaged in boxes as follows. For UN0059, 0439, 0440, and 0441, when shaped charges are packed singly, the conical cavity must face downwards and the package marked "THIS END UP". When shaped charges are packed in pairs, the conical cavities must face inwards. Package as follows:

Inner packaging	Outer packaging
Bags: plastic *or* Boxes: fiberboard *or* Tubes: fiberboard, metal, plastic *or* Dividing partitions within outer packaging	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G)

A5.22. Charges, Shaped, Flexible, Linear must be packaged as follows:

A5.22.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: plastic ***NOTE:*** If ends of articles are sealed, inner packaging is not required	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.22.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: plastic ***NOTE:*** If ends of articles are sealed, inner packaging is not required	Drums: removable head steel (1A2) removable head aluminum (1B2)

A5.23. Cord or Fuse, Detonating; Cord or Fuse, Detonating Mild Effect must be packaged as follows. Seal and tie securely the ends of the detonating cord. Inner packaging is not required for UN 0065 and 0289 when securely fastened in coils.

A5.23.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: plastic *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: paper, plastic *or* Reels	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.23.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: plastic *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: paper, plastic *or* Reels	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G)

A5.24. Cord, Igniter; Fuse, Igniter; Fuse, Non-detonating; or Fuse, Safety must be packaged as follows. For UN 0101, do not use steel or aluminum packaging and the packaging must be sift-proof unless the fuse is covered by a paper tube and both ends of tube are covered with removable caps.

A5.24.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: plastic *or* Sheets: kraft paper, plastic *or* Reels ***NOTE:*** Inner packaging not required for UN 0105 if ends are sealed	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.24.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: plastic *or* Sheets: kraft paper, plastic *or* Reels ***NOTE:*** Inner packaging not required for UN 0105 if ends are sealed	Drums: removable head steel (1A2), removable head aluminum (1B2), fiber (1G)

A5.25. Fuzes, Detonating; Fuzes, Igniting; Grenades; and Grenades, Practice must be packaged as follows:

A5.25.1. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: fiberboard, metal, plastic, wood *or* Trays (individual partitions): plastic wood *or* Dividing partitions in the outer packaging	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.25.2. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: fiberboard, metal, plastic, wood *or* Trays (individual partitions): plastic wood *or* Dividing partitions in the outer packaging	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.26. Igniters or Lighters, Fuse must be packaged as follows:

A5.26.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: paper *or* Trays (individual partitions): plastic	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.26.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: paper *or* Trays (individual partitions): plastic	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.27. Charges, Propelling must be packaged as follows. Ensure metal packagings are constructed so that risk of explosion, by reason of increase in internal pressure (from internal or external causes), is prevented.

A5.27.1. Package in boxes as follows:

Inner packaging	Outer packaging
Bags: kraft paper, plastic, textile, rubberized textile *or* Receptacles: fiberboard, metal, plastic *or* Trays (individual partitions): plastic, wood	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.27.2. Package in drums as follows:

Inner packaging	Outer packaging
Bags: kraft paper, plastic, textile, rubberized textile *or* Receptacles: fiberboard, metal, plastic *or* Trays (individual partitions): plastic, wood	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G)

A5.27.3. Package in composite packaging as follows:

Inner packaging	Outer packaging
Inner packaging not required with use of 6HH2 package	Plastic receptacle with outer solid box (6HH2)

A5.28. Contrivances, Water-Activated must be packaged as follows:

A5.28.1. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: fiberboard, metal, plastic *or* Dividing partitions in the outer packaging	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), plywood (4D), reconstituted wood (4F), expanded plastic (4H1). Wooden boxes 4C1, 4D and 4F must contain a metal liner. Seal packagings against the ingress of water.

A5.28.2. Large and Robust Articles must be packaged as follows. Large and robust articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked provided that a negative result was obtained in Test Series 4 of the UN Manual of Tests and Criteria on an unpackaged article. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of transport. Such articles may be in DOD-approved containers, crates, cradles, or other suitable handling, storage, or launching devices which have been tested to show that they will not become loose during normal conditions of transport. Must contain at least two independent features which prevent the ingress of water.

Attachment 6

CLASS 2--COMPRESSED GASES

A6.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 2.1 (flammable gas), Class 2.2 (nonflammable, nontoxic compressed gas), and Class 2.3 (toxic gas). See **Attachment 3** for additional information concerning Class 2 material.

A6.2. Aerosols. Prepare aerosols meeting the definition of "Consumer Commodity" as authorized under paragraph **A13.3.** Aerosol products identified under the proper shipping name "Aerosols" must be packaged as follows:

A6.2.1. Aerosols Containing Non-Toxic Substances. For an aerosol containing non-toxic substances, pack in inner non-refillable non-metal receptacles not exceeding 120 mL (4 fluid-ounce) capacity each, or in inner non-refillable metal or plastic receptacles not exceeding 1 L (34 fluid-ounces) provided all of the following conditions are met:

A6.2.1.1. Pressure in the aerosol container must not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55 degrees C (130 degrees F).

A6.2.1.2. If the pressure exceeds 970 kPa at 55 degrees C (140 psig at 130 degrees F) but does not exceed 1105 kPa at 55 degrees C (160 psig at 130 degrees F) use a DOT 2P, IP7, IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1105 kPa at 55 degrees C (160 psig at 130 degrees F) but does not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) use a DOT 2Q, IP7A, or IP7B inner metal receptacle.

A6.2.1.3. Liquid content of the material and the gas must not completely fill the receptacle at 55 degrees C (130 degrees F).

A6.2.1.4. Each aerosol exceeding 120 mL (4 fluid ounce) capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the content at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.2.1.5. Protect the valves by a cap or other suitable means.

A6.2.1.6. Tightly pack aerosols in a strong outer packaging capable of meeting packaging performance test outlined in **A19.3.4.** UN specification (UN marked) packaging is not required. The complete package must not exceed 30 kg (66 lbs) gross weight.

A6.2.2. Other Aerosols. For other aerosols (including those containing toxic substances), pack in inner non-refillable non-metal receptacles not exceeding 120 mL (4 fluid ounce) capacity each, or in inner non-refillable metal receptacles not exceeding 1 L (34 fluid ounces) provided all of the following conditions are met:

A6.2.2.1. Pressure in the aerosol container must not exceed 1500 kPa at 55 degrees C (217 psig at 130 degrees F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55 degrees C (130 degrees F).

A6.2.2.2. If the pressure exceeds 970 kPa at 55 degrees C (140 psig at 130 degrees F) but does not exceed 1105 kPa at 55 degrees C (160 psig at 130 degrees F) use a DOT 2P, IP7, IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1105 kPa at 55 degrees C (160 psig at 130 degrees

F) but does not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) use a DOT 2Q, IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1245 kPa at 55 degrees C (180 psig at 130 degrees F) but does not exceed 1500 kPa at 55 degrees C (217 psig at 130 degrees F) use an IP7B inner metal receptacle.

A6.2.2.3. Liquid content of the material and the gas must not completely fill the receptacle at 55 degrees C (130 degrees F).

A6.2.2.4. Each aerosol exceeding 120 mL (4 fluid ounce) capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.2.2.5. Protect the valves by a cap or other suitable means.

A6.2.2.6. Tightly pack aerosols in an outer fiberboard (4G), wooden (4C1, 4C2), plywood (4D), reconstituted (4F), or plastic (4H1, 4H2) box. The packaging must meet PG II requirements.

A6.2.3. For an aerosol charged with a non-toxic solution containing a biological product or medical preparation that could be deteriorated by heat and compressed gases (except Class 6.1, PG III material that are poisonous or nonflammable) pack in inner non-refillable metal receptacles provided all of the following conditions are met:

A6.2.3.1. The capacity of each inner receptacle must not exceed 575 mL (20 fluid ounces).

A6.2.3.2. Pressure in the receptacle must not exceed 970 kPa at 55 degrees C (140 psig at 130 degrees F).

A6.2.3.3. The liquid content of the product and gas must not completely fill the receptacle at 55 degrees C.

A6.2.3.4. One aerosol out of each lot of 500 or less, filled for shipment, must be heated until the pressure in the container is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.2.3.5. Protect the valves by a cap or other suitable means.

A6.2.3.6. Package inner receptacles in a strong outer packaging. The outer packaging must be capable of meeting the limited quantity performance standards outlined in **A19.3.4.** UN specification (UN marked) packaging is not required.

A6.2.3.7. The complete package must not exceed 30 kg (66 lbs) gross weight.

A6.2.4. For an aerosol containing a biological product or medical preparation that could be deteriorated by heat and is nonflammable pack in inner non-refillable metal receptacles provided all of the following conditions are met:

A6.2.4.1. The first five subparagraph requirements of **A6.2.3.** related to the aerosol receptacles apply.

A6.2.4.2. Tightly pack aerosol containers in an outer fiberboard (4G), wooden (4C1, 4C2), plywood (4D), reconstituted (4F), or plastic (4H1, 4H2) box. The packaging must meet PG II requirements.

A6.3. Small Receptacles Containing Compressed Gas. Small receptacles of compressed gases, other than aerosols or Consumer Commodities, as identified in this paragraph, must be packaged as follows.

Unless otherwise specified, UN specification (UN marked) packaging is not required. Each package must not exceed 30 kg (66 lbs) gross weight. For unregulated compressed gases, comply with general handling requirements in **A3.3.2.**

A6.3.1. Use containers, except cigarette lighters, of not more than 120 mL (4 fluid ounces, 7.22 cubic inches or less) capacity each. Package inner receptacles in strong outer packaging.

A6.3.2. Use metal containers filled with nonhazardous material not over 90 percent capacity at 21 degrees C (70 degrees F) then charged with a nonflammable, nonliquefied gas. Each container must be tested to three times the gas pressure at 21 degrees C (70 degrees F). When refilled, the container must be retested to three times the gas pressure at 21 degrees C (70 degrees F) provided one of the following conditions are met:

A6.3.2.1. Container is not over 1 L (1 quart) capacity and charged to not more than 1172 kPa at 21 degrees C (170 psig at 70 degrees F.

A6.3.2.2. Container is not over 114L (30 gallon) capacity and charged to not more than 517 kPa at 21 degrees C (75 psig at 70 degrees F).

A6.3.3. Package electronic tubes of not more than 489 mL (30 cubic inch) volume charged with gas to a pressure of not more than 241 kPa (35 psig). Package in strong outer packaging.

A6.3.4. Use inside metal containers of a capacity not over 570.7 mL (35 cubic inches, 19.3 fluid ounces), charged with nonflammable, nonpoisonous or noncorrosive liquefied compressed gas designed for audible fire alarm systems. Pressure in the container must not exceed 482.6 kPa at 21 degrees C (70 psig at 70 degrees F). The completely assembled non-refillable container must be designed and fabricated with a burst pressure of not less than four times its charged pressure at 55 degrees C (130 degrees F.) Each refillable inside container must be designed and fabricated with a burst pressure of not less than five times its charged pressure at 55 degrees C (130 degrees F). The liquid portion of the gas must not completely fill the container at 55 degrees C (130 degrees F).

A6.3.5. A cylinder that is a component part of a passenger restraint system and is installed in a motor vehicle, charged with nonliquefied, nonflammable compressed gas and having no more than two actuating cartridges per valve, is exempt from the requirements of this manual with the following exceptions:

A6.3.5.1. Cylinder must comply with one of the cylinder specifications in 49 CFR, Part 178, and be authorized for use in **A6.6.** for the gas it contains.

A6.3.5.2. Cylinder must comply with the filling requirements of **A3.3.2.6.**

A6.3.6. A cylinder that is part of a tire inflation system in a motor vehicle, charged with a nonliquefied, nonflammable compressed gas, and is excepted from the requirements of this manual except the following:

A6.3.6.1. Cylinder must comply with one of the cylinder specifications in 49 CFR, Part 178, and be authorized for use in **Table A6.1.** for the gas it contains.

A6.3.6.2. Cylinder must comply with the filling requirements of **A3.3.2.6.**

A6.3.6.3. Each cylinder must be securely installed in the trunk of the motor vehicle, and the valve must be protected against accidental discharge.

A6.4. Liquefied Compressed Gases. Liquefied compressed gases must be packaged as follows:

A6.4.1. Ship a nontoxic and nonflammable mixture (including insecticides) that contains a compressed gas according to this paragraph. Ship liquefied compressed gases in accordance with the filling, pressure, and DOT cylinder specification requirements of **Table A6.1.** If the compressed gas is not specifically identified in **Table A6.1.**, ship (except gas in solution) in DOT 3, 3A, 3AA, 3B, 3BN, 3D, 3E, 4, 4A, 4B, 4BA, 4B240ET, 4BW, 4E, 9, 25, 26, 38, 39, 40, or 41 cylinders. Ensure compliance with general handling requirements in **A3.2.2.** Do not charge and ship DOT 4E, 9, 39, 40, or 41 cylinders with a mixture containing a pyrophoric liquid, carbon bisulfide (disulfide), ethyl chloride, ethylene oxide, nickel carbonyl, spirits of nitroglycerin, or toxic material, (Class 6.1 or 2.3) unless authorized in a specific packaging paragraph. Use of existing cylinders, DOT 3, 3D, 4, 4A, 9, 25, 26, 38, 40, and 41 is authorized, but new construction of these cylinders is not authorized.

A6.4.2. DOT 3AL Cylinders. Use DOT 3AL cylinders to ship Carbonyl sulfide, cyclobutane, dimethyl ether, hydrogen selenide, propylene, silane, and vinyl bromide. Shipments are authorized on cargo aircraft only.

A6.4.3. Nitrous Oxide. Use DOT 3AL cylinders to ship nitrous oxide only under the following conditions:

A6.4.3.1. The cylinder must be equipped only with brass or stainless steel valve.

A6.4.3.2. Each cylinder must be cleaned and in compliance with the requirements of Federal Specification RR-C-901c.

A6.4.4. Mixtures With Class 2.3. Ship a mixture containing any Class 2.3 material or irritating material, in such proportion that the mixture would be classed as toxic, in containers authorized in **Attachment 10**.

A6.4.5. Refrigerant Gases. Ship refrigerant gases that are nonpoisonous and nonflammable in cylinders prescribed in **A6.4.1.** or as follows: In DOT 2P and 2Q inside metal containers packed in a strong wooden or fiberboard box designed to protect valves from injury or accidental functioning under conditions incident to transportation. Pressure in the container must not exceed 586 kPa at 21 degrees C (85 psia at 70 degrees F). Each completed metal container filled for shipment must be heated until contents reach a minimum temperature of 55 degrees C (130 degrees F), without evidence of leakage, distortion, or other defects.

A6.4.6. Engine Starting Fluid. Engine-starting fluids containing compressed gas (or gases) that are flammable in cylinders prescribed in **A6.4.1.** or as follows:

A6.4.6.1. Inside nonrefillable metal containers not over 522 mL (32 cubic inch) capacity. Pressure in the container must not exceed 966 kPa at 55 degrees C (140 psia at 130 degrees F).

A6.4.6.2. If the pressure exceeds 966 kPa at 55 degrees C (140 psia at 130 degrees F) use a DOT 2P container.

A6.4.6.3. Any metal container must be capable of withstanding a pressure of 1 1/2 times the pressure of the content at 55 degrees C (130 degrees F) without bursting.

A6.4.6.4. Each container filled for shipment must have been heated until the contents reach a minimum temperature of 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.4.6.5. Pack inside nonrefillable metal containers in a strong tight outer packaging.

A6.4.7. Foreign Cylinders. Foreign cylinders meeting the requirements of **A3.3.2.8.**

A6.4.8. UN Specification cylinders marked with "USA" as country of approval.

A6.5. Nonliquefied Compressed Gases. Nonliquefied compressed gases must be packaged as follows:

A6.5.1. Ship nonliquefied, compressed gases in accordance with the filling, pressure, and DOT cylinder specification requirements of **Table A6.1.** If the compressed gas is not specifically identified in **Table A6.1.**, ship in DOT 3, 3A, 3AA, 3B, 3C, 3D, 3E, 4, 4A, 4B, 4BA, 4BW, 4C, 25, 26, 33, or 38. Use of existing cylinders, DOT 3, 3C, 3D, 4, 4A, 4C, 25, 26, 33, and 38 is authorized, but new construction of these cylinders is not authorized.

A6.5.2. DOT-3HT Cylinders. DOT-3HT cylinders for use in aircraft only, having a maximum service life of 24 years, are only authorized for nonflammable gases. They must be equipped with a frangible disc safety relief device, without fusible metal backing, with a rated bursting pressure not over 90 percent of the minimum required test pressure of the cylinder with which the device is used. Pack cylinders in strong outer packagings.

A6.5.3. DOT 39 Cylinder. Use DOT 39 cylinder. For flammable gases, the internal volume must not exceed 1.2 L (75 cubic inches). Use aluminum cylinders for oxygen only under the following conditions:

A6.5.3.1. Cylinder threads must be straight threads.

A6.5.3.2. Valves must be made of brass or stainless steel.

A6.5.3.3. Each cylinder must be cleaned to comply with the requirements of Federal Specification R-C-901c.

A6.5.4. DOT 3AL Cylinder. Use DOT 3AL cylinder only for the following nonliquefied gases: air, argon, carbon monoxide, ethylene, helium, mercury free hydrogen, krypton, methane, nitrogen, neon, oxygen, and xenon. Ship flammable gases in 3AL cylinders on cargo aircraft only. When used in oxygen service, the cylinders must comply with 49 CFR 173.302(a)(5).

A6.5.5. Carbon Monoxide. Ship carbon monoxide in a DOT-3A, 3AX, 3AA, 3AAX, 3AL, 3, 3E, or 3T cylinder having a minimum service pressure of 12,411 kPa (1800 psig). The pressure in the cylinder must not exceed 6895 kPa at 21 degrees C (1000 psig at 70 degrees F), except that if the gas is dry and sulfur free, the cylinder may be charged to five-sixths of the cylinder service pressure of 13,790 kPa (2000 psig), whichever is the least.

A6.5.6. DOT 3AX, 3AAX, 3T Cylinders. Use cylinders, DOT 3AX, 3AAX, or 3T only for the following nonliquefied gases: air, argon, boron trifluoride, carbon monoxide, ethane, ethylene, helium, hydrogen, methane, neon, nitrogen, or oxygen, except that specification 3T is not authorized for hydrogen. As used in this paragraph, methane is a nonliquefied gas which has a minimum purity of 98.0 percent methane and which is commercially free of corroding components.

A6.5.7. Fluorine. For fluorine gas use only DOT 3A1000, 3AA1000, or 3BN400 cylinders without a safety relief device and equipped with valve protection caps. Do not charge cylinders over 2758 kPa at 21 degrees C (400 psig at 70 degrees F) and ensure contents do not exceed 2.7 kg (6 pounds) of gas.

A6.5.8. Recoil Mechanisms/Artillery Gun Mounts. Pack recoil mechanisms or artillery gun mounts containing nitrogen charged to a maximum pressure of 15,858 kPa at 21 degrees C (2300 psig at 70 degrees F) in strong outer wooden containers. Ship recoil mechanisms or artillery gun mounts containing nitrogen unpackaged when securely attached to the weapon system.

A6.5.9. Liquid Argon, Oxygen, and Nitrogen Samples. Liquid argon, oxygen, or nitrogen samples under pressure, may be shipped in Cosmodyne Gas Samplers, Models CS 4.4 and CS 2.0 or in TTU-131/E Sampler (MIL-S-27626). See applicable technical directive for overpack instructions. Take samples in the liquid state but vaporize before shipment.

A6.5.10. LAU-7/A Launcher-Receiver Assembly. Ship LAU-7/A launcher-receiver assemblies charged with nitrogen not over 1724 kPa (250 psig).

A6.5.11. Satellites, Spacecraft, and Other Articles Charged with Nitrogen or Dry Air. These items may be transported inside a protective shipping container with a nitrogen or air purge during flight. The compressed gas must be in authorized cylinders and protected from damage during transport. The system must be equipped with a safety valve, enabling the nitrogen flow to be immediately shut off in the event of a problem while on the aircraft. Transport authorized on C-141, C-5, and C-17 aircraft only. The following limitations apply:

A6.5.11.1. Nitrogen may be purged into the shipping container at a rate not to exceed five (5) cubic feet per hour.

A6.5.11.2. Nitrogen may be purged into the shipping container at a rate not to exceed twenty (20) cubic feet per hour during transport. A technical escort must, using a portable oxygen monitor, continuously check the atmosphere inside the aircraft during flight. If the percentage of oxygen drops to 19.5% per volume, the escort must notify the aircraft commander immediately and the nitrogen purge immediately discontinued. All personnel will utilize supplemental oxygen until the percentage of oxygen exceeds 19.5% per volume. Provide maximum airflow rate in the cargo compartment during flight. Cargo doors must remain open during ground operations to provide adequate ventilation.

A6.5.11.3. Dry air may be purged into the shipping container at a rate not to exceed 70 cubic feet per hour.

A6.5.11.4. All other requirements of this manual must be met.

A6.5.11.5. See **Attachment 17** for additional certification requirements.

A6.5.12. Diborane and Diborane Mixtures. For Diborane and Diborane mixtures, use only a DOT 3AL or 3AA Cylinders having a minimum service pressure of 12,411 kPa (1800 psig). The maximum filling density of the diborane may not exceed 7 percent. Diborane mixed with compatible compressed gas may not have a pressure exceeding the service pressure of the cylinder if complete decomposition of the diborane occurs.

A6.5.13. Foreign Cylinders. Foreign cylinders meeting the requirements of **A3.3.2.8.**

A6.5.14. UN Specification cylinders marked with "USA" as country of approval.

Table A6.1. Cylinder Requirements for Compressed Gases.

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.6.)	Cylinders Marked as Shown Below Must be Used
Bromotrifluoromethane (R-13B1 or H-1301)	124	DOT-3A400, DOT-3AA400, DOT-3AL400, DOT-3B400, DOT-3E1800, DOT-4A400, DOT-4AA480, DOT-4B400, DOT-4BA400, DOT-4BW400, DOT-39
Carbon dioxide (see notes 3 and 4)	68	DOT-3, DOT-3A1800, DOT-3AA1800, DOT-3AL1800, DOT-3AX1800, DOT-3AAX1800, DOT-3E1800, DOT-3HT2000, DOT-3T1800, DOT-39
Chlorine (see note 1)	125	DOT-3, DOT-3A480, DOT-3AA480, DOT-3BN480, DOT-3E1800, DOT-25
Chlorodifluroethane (R142b) or Chloro-1,1-Difluoroethane (see note 4)	100	DOT-3A150, DOT-3AA150, DOT-3AL150, DOT-3B150, DOT-3E1800, DOT-4B150, DOT-4BA225, DOT-4BW225, DOT-39
Chlorodifluoromethane (R22) (see note 4)	105	DOT-3A240, DOT-3AA240, DOT-3ALA240, DOT-3B240, DOT-3E1800, DOT-4B240, DOT-4B240ET, DOT-4BA240, DOT-4BW240, DOT-4E240, DOT-39, DOT-41
Chloropentafluorethane (R-115)	110	DOT-3A225, DOT-3AA225, DOT-3AL225, DOT-3B225, DOT-3E1800, DOT-4A225, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-39
Chlorotrifluoromethane (R-13) (see note 4)	100	DOT-3, DOT-3A1800, DOT-3AA1800, DOT-3AL1800, DOT-3E1800, DOT-39

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.6.)	Cylinders Marked as Shown Below Must be Used
Cyclopropane (see notes 4 and 5)	55	DOT-3, DOT-3A225, DOT-3A480X, DOT-3AA225, DOT-3AL225, DOT-3B225, DOT-3E1800, DOT-4A225, DOT-4AA480, DOT-4B225, DOT-4B240ET, DOT-4BA225, DOT-4BW225, DOT-39
Dichlorodifluoromethane (R-12) (see note 4)	119	DOT-3A225, DOT-3AA225, DOT-3AL225, DOT-3B225, DOT-3E1800, DOT-4A225, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-4E225, DOT-9, DOT-39, DOT-41
Dichlorodifluoromethane and difluoroethane mixture (constant boiling mixture) (R-500) (see note 4)	Not liquid full at 54 degrees C (130 degrees F)	DOT-3A240, DOT-3AA240, DOT-3B240, DOT-3E1800, DOT-4A240, DOT-4B240, DOT-4BA240, DOT-4BW240, DOT-4E240, DOT-9, DOT-39
Difluoroethane (R-152a) (see note 4)	79	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-3AL150, DOT-3E1800, DOT-4B150, DOT-4BA225, DOT-4BW225
1,1-Difluoroethylene (R-1132A)	73	DOT-3A2200, DOT-3AA2200, DOT-3AX2200, DOT-3AAX2200, DOT-3T2200, DOT-39
Dimethylamine, anhydrous	59	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-4BW225, ICC-3E1800

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.6.)	Cylinders Marked as Shown Below Must be Used
Ethane (see notes 4 and 5)	35.8	DOT-3, DOT-3A1800, DOT-3AA1800, DOT-3AL1800, DOT-3AAX1800, DOT-3AX1800, DOT 3E1800, DOT-3T1800, DOT-39
Ethane (see notes 4 and 5)	36.8	DOT-3A2000, DOT-3AA2000, DOT-3AAX2000, DOT-3AL2000, DOT-3AX2000, DOT-3T2000, DOT-39
Ethylene (see notes 4 and 5)	31.0	DOT -3, DOT-3A1800, DOT -3AA1800, DOT-3AAX1800, DOT-3AL1800, DOT-3AX1800, DOT-3E1800, DOT-3T1800, DOT-39
Ethylene (see notes 4 and 5)	32.5	DOT-3A2000, DOT-3AA2000, DOT-3AAX2000, DOT-3AL2000, DOT-3AX2000, DOT-3T2000, DOT-39
Ethylene (see notes 4 and 5)	35.5	DOT-3A2400, DOT-3AA2400, DOT-3AAX2400, DOT-3AL2400, DOT-3AX2400, DOT-3T2400, DOT-39
Hydrogen chloride	65	DOT-3, DOT-3A1800, DOT-3AA1800, DOT-3AAX1800, DOT-3AX1800, DOT-3E1800, DOT-3T1800

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.6.)	Cylinders Marked as Shown Below Must be Used
Hydrogen sulfide (see note 6)	62.5	DOT-3A480, DOT -3AA480, DOT-3AL480, DOT-3B480, DOT-3E1800, DOT-4A480, DOT-4B480, DOT-4BA480, DOT-4BW480, DOT-26-480
Insecticide liquefied gas (see note 4 and 8)	Not liquid full at 54 degrees C (130 degrees F)	DOT-3A300, DOT-3AA300, DOT-3B300, DOT-3E1800, DOT-4B300, DOT-4BA300, DOT-4BW300, DOT-9, DOT-40, DOT-41
Liquefied nonflammable gases, liquids other than those classified as flammable, corrosive, or poisonous, and mixtures or solutions thereof, charged with nitrogen, carbon dioxide or air (see notes 3 and 4)	Not liquid full at 54 degrees C (130 degrees F)	DOT specification cylinders identified in A6.4.1. and DOT-3HT, DOT-4D, DOT-4DA, DOT-4DS
Methylacetylene-propadiene stabilized (see note 2)	Not liquid full at 54 degrees C (130 degrees F)	DOT-3A240, DOT-3AA240, DOT-3AL240, DOT-3B240, DOT-3E1800, DOT-4, DOT-4B240, without brazed seams; DOT-4B240ET, DOT-4BA240, without brazed seams; DOT-4BW240, DOT-4E240, DOT-41
Methyl chloride	84	DOT-3, DOT-3A225, DOT-3AA225, DOT-3B225, DOT-3E1800, DOT-4, DOT-4A225, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-25, DOT-26-300, DOT-38, Cylinders complying with DOT-3A150, 3B150, 4A150, and 4B150 manufactured before 7 December 1936 are also authorized.

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.6.)	Cylinders Marked as Shown Below Must be Used
Methyl mercaptan	80	DOT-3A240, DOT-3AA240, DOT-3B240, DOT-3E1800, DOT-4B240, DOT-4B240ET, DOT-4BA204, DOT-4BW240
Monomethylamine, anhydrous	60	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-3E1800, DOT-4B150, DOT-4BA225, DOT-4BW225
Nitrosyl Chloride	110	DOT-3BN400 only
Nitrous Oxide (see notes 3, 4, and 7)	68	DOT-3, DOT-3A1800, DOT-3AA1800, DOT-3AAX1800, DOT-3AL1800, DOT-3AX1800, DOT-3E1800, DOT-3HT2000, DOT-3T1800, DOT-39
Refrigerant gas, NOS or Dispersant gas, NOS (see notes 4 and 9)	Not liquid full at 54 degrees C (130 degrees F)	DOT-3A240, DOT-3AA240, DOT-3AL240, DOT-3B240, DOT-3E1800, DOT-4A240, DOT-4B240, DOT-4BA240, DOT-4BW240, DOT-4E240, DOT-9, DOT-39
Sulfur dioxide (see note 4)	125	DOT-3, DOT-3A225, DOT-3AA225, DOT-3AL225, DOT-3B225, DOT-3E1800, DOT-4, DOT-4A225, DOT-4B225, DOT-4B240ET, DOT-4BA225, DOT-4BW225, DOT-25, DOT-26-150, DOT-38, DOT-39
Sulfur hexafluoride	120	DOT-3, DOT-3A1000, DOT-3AA1000, DOT-3AAX2400, DOT-3AL1000, DOT-3E1800, DOT-3T1800
Sulfuryl fluoride	106	DOT-3A480, DOT-3AA480, DOT-3E1800, DOT-4B480, DOT-4BA480, DOT-4BW480

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.6.)	Cylinders Marked as Shown Below Must be Used
Tetrafluoroethylene, stabilized	90	DOT-3A1200, DOT-3AA1200, DOT-3E1800
Trifluorochloroethylene	115	DOT-3A300, DOT-3AA300, DOT-3B300, DOT-3E1800, DOT-4A300, DOT-4B300, DOT-4BA300, DOT-4BW300
Trimethylamine, anhydrous	57	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-3E1800, DOT-4B150, DOT-4BA225, DOT-4BW225
Vinyl chloride (see note 2)	84	DOT-3A150, DOT- 3AA150, DOT-3AL150, DOT-3E1800, DOT-4B150, without brazed seams; DOT-4BA225, without brazed seams;DOT-4BW225, DOT-25
Vinyl fluoride, stabilized	62	DOT-3A1800, DOT-3AA1800, DOT-3AL1800, DOT-3E1800
Vinyl methyl ether (see note 2)	68	DOT-3A150, DOT-3AA150, DOT-3B150, DOT 3E1800, DOT-4B150, without brazed seams; DOT-4BA225, without brazed seams; DOT-4BW225, DOT-25

NOTES:

1. Cylinders purchased after 1 October 1944 for the transportation of chlorine must contain no aperture other than that provided in the neck of the cylinder for attachment of a valve equipped with an approved safety device. Cylinders purchased after November 1, 1935 and charged with chlorine must not contain over 150 pounds of gas.
2. All parts of valve and safety devices in contact with contents of cylinders must be of a metal or other material, suitably treated if necessary, which will not cause formation of any acetylides.
3. DOT-3HT cylinders are authorized for use in aircraft only for a maximum service life of 24 years. They must be equipped with a frangible disc safety relief device, without fusible metal backing, and with a rated bursting pressure not over 9 percent of the minimum required test pressure of the cylinder with which the device is used. Ship only nonflammable gases in these cylinders and pack in strong outer packagings.

4. Refer to **A3.3.2.5.** for additional packaging requirements, if applicable.
5. When used for shipment of flammable gases, the internal volume of the specification 39 cylinders must not be over 75 cubic inches.
6. Ensure each valve outlet is sealed by a threaded cap or a threaded solid plug.
7. Ensure DOT-3AL cylinders are equipped with brass or stainless steel valves and cleaned in compliance with Federal Specification RR-C-901c.
8. See **A6.4.1.** and **A6.4.5.** (Only DOT 2P is authorized).
9. See **A6.4.5.**

A6.6. Liquefied Petroleum Gas (see **A3.3.2.** for additional cylinder and filling requirements). Liquefied petroleum gas must be packaged as follows:

A6.6.1. Use DOT 3, 3A, 3AA, 3AL, 3B, 3E, 4, 4A, 4B, 4BA, 4BW, 4B240FLW, 4B240ET, 4B240X, 4E, 9, 25, 26, 38, 39, or 41 cylinders. Ensure the internal volume of DOT 39 cylinders is not over 1.2 L (75 cubic inches). Use of existing DOT 3, 4, 4A, 4B240X, 9, 25, 26, 38, and 41 cylinders is authorized, but new construction of these cylinders is not authorized.

A6.6.2. DOT 4B240FLW Cylinders. Use cylinders marked as complying with DOT 4B240FLW, bearing manufacturers symbol WCO and serial numbers 47A-1 to 47A-59200 (inclusive), and varying from the specification requirements for the physical properties of steel.

A6.6.3. DOT 3C or 4C Cylinders. Use DOT 3C or 4C cylinders, when the capacity of cylinders is not over 60.5 L (3,881 cubic inches, 16 gallons) with 5 percent tolerance. Do not exceed a gas pressure over 1000 kPa (145 psig) at 55 degrees C (130 degrees F). Comply with the requirements of **Table A6.1.** for the gases named.

A6.6.4. DOT 2P or 2Q Containers. Use inside metal containers, DOT 2P or 2Q, packed in strong wooden or fiberboard boxes designed to protect valves from injury or accidental functioning under normal transportation conditions. These containers are authorized for liquefied petroleum gas with a gas pressure of 241 kPa (35 psig) at 21 degrees C (70 degrees F) and 689.5 kPa (100 psig) at 55 degrees C (130 degrees F) (or not over 310.3 kPa (45 psig) at 21 degrees C (70 degrees F) and 724 kPa (105 psig) at 55 degrees C (130 degrees F) when equipped with safety devices which will prevent rupture of the container when it is exposed to fire.) Each completed container filled for shipment must have been heated until contents reached a minimum temperature of 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.6.5. Foreign Cylinders. Foreign cylinders meeting the requirements of **A3.3.2.8.**

A6.6.6. UN Specification cylinders marked with "USA" as country of approval.

A6.7. Fire Extinguishers. Fire extinguishers authorized below may be shipped secured in holders as part of a vehicle/equipment (**A13.4.**, **A13.5.**, **A13.6.**) when protected from possible accidental damage. If these fire extinguishers are not fastened in a designed holder, they must be packed in strong outer containers. Ship fire extinguishers in DOT specification cylinders identified in paragraphs **A6.7.1.** and **A6.7.2.** Ship fire extinguishers in non-DOT specification cylinders as identified in paragraphs **A6.7.3.** and **A6.7.4.** Fire suppression bottles in DOT specification 3HT, 4D, 4DA, or 4DS, use description “Liquefied Gases,

UN1058"; "Compressed Gas, N.O.S., UN 1956"; or the hazard classification assigned by the manufacturer. See paragraph **A6.4.1.** and **Table A6.1.**

A6.7.1. DOT 3A, 3AA, 3AL, 3E, 4B, 4BA, 4B240ET, or 4BW Cylinders. Use these cylinders provided:

A6.7.1.1. Cylinders contain only fire extinguishing agents such as ammonium phosphate, sodium bicarbonate, potassium bicarbonate, potassium imido dicarboxamide and bromochlorodifluromethane or bromotriflouromethane, which is commercially free from corroding components.

A6.7.1.2. Cylinders are charged with a nonflammable, nontoxic, noncorrosive, dry gas, having a dew point at or below minus 46.7 degrees C (minus 52 degrees F) at 101 kPa (1 atmosphere), to not more than the service pressure of the cylinder.

A6.7.1.3. Cylinders have an external corrosion-resistant coating.

A6.7.1.4. Cylinders are retested in accordance with Title 49 CFR 178.209(j).

A6.7.1.5. Fire extinguisher, DOT 4BW240, on a cart does not require additional packaging.

A6.7.2. DOT 2P or 2Q Containers. Use DOT 2P or 2Q inner nonrefillable metal containers provided:

A6.7.2.1. The liquid portion of the gas plus any additional liquid or solid does not completely fill the container at 55 degrees C (130 degrees F).

A6.7.2.2. The pressure in the container does not exceed 1250 kPa (181 psig) at 55 degrees C (130 degrees F). If the pressure exceeds 920 kPa (141 psig) at 55 degrees C (130 degrees F), but does not exceed 1100 kPa (160 psig) at 55 degrees C (130 degrees F), use a DOT 2P inner metal container. If the pressure exceeds 1100 kPa (160 psig) at 55 degrees C (130 degrees F) use a DOT 2Q inner metal container. The metal container must be capable of withstanding, without bursting, a pressure of one and one-half times the equilibrium pressure of the contents at 55 degrees C (130 degrees F).

A6.7.2.3. Each completed inner container filled for shipment must have been heated until the pressure in the container is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defect.

A6.7.3. Fire Extinguishers with a Small Amount of Compressed Gas. May not contain more than 1660 kPa at 21 degrees C (241 psig at 70 degrees F). Fire extinguishers marked "MEETS DOT REQUIREMENTS" are excepted from DOT cylinder specification requirements provided:

A6.7.3.1. They are shipped as inside containers. Use original manufacturer's packaging or suitable outer packaging to protect extinguisher during normal transportation.

A6.7.3.2. The contents are not flammable, toxic, or corrosive.

A6.7.3.3. Internal volume is not over 18 L (1,100 cubic inches). For fire extinguishers not over 900 mL (55 cubic inch) capacity, the liquid portion of the gas plus any additional liquid or solid must not completely fill the container at 55 degrees C (130 degrees F). Fire extinguishers over 900 mL (35 cubic inches) may not contain liquefied compressed gas.

A6.7.3.4. Fire extinguishers manufactured on and after 1 January 1976 must be designed and fabricated with a burst pressure not less than six times its charged pressure at 21 degrees C (70 degrees F).

A6.7.3.5. Fire extinguishers are tested to three times the charged pressure at 21 degrees C (70 degrees F), but not less than 825 kPa (120 psig) without failure before the initial shipment. For any subsequent shipments, they must meet retest requirements of 29 CFR 1910.157(e).

A6.7.4. FEU-1/M Extinguisher. Transport extinguisher (FEU-1/M) 10 gallon (37.8 L) capacity on military aircraft without special packing and crating. Use caution during handling and transportation to avoid damage to valves.

A6.7.5. Mounted Extinguishers. Fire extinguishers authorized by **A6.7.** may be shipped secured in holders of non-regulated vehicles/equipment when protected from possible accidental damage and safety pin/clip installed. Certify according to **Attachment 17**. If these fire extinguishers are not fastened in a designed holder, pack in strong outer containers.

A6.7.6. Foreign Fire Extinguishers. Foreign fire extinguishers must meet the requirements of **A3.3.2.8.**

A6.7.7. UN Specification cylinders marked with "USA" as country of approval.

A6.8. Refrigerating Machines, Air Conditioners, and Articles, Pressurized Hydraulic or Pneumatic must be packaged as follows:

A6.8.1. Refrigerating Machines, Air Conditioners, and Components. Factory-tested refrigerating machines, air conditioners, and components are exempted from specification packaging, marking, and labeling except for the name of contents on the outer packaging, provided (see **A3.3.2.9.** for small quantities):

A6.8.1.1. Each pressure vessel is charged to not more than 2268 kg (5,000 pounds) of Group A1 refrigerant as classified in ANSI/ASHRAE Standard 15, or not more than 22.7 kg (50 pounds) of refrigerant other than Group A1.

A6.8.1.2. Machines containing two or more charged vessels may not contain more than 907 kg (2,000 pounds) of Group 1 refrigerant, or more than 45.4 kg (100 pounds) of refrigerant other than Group 1.

A6.8.1.3. Each pressure vessel is equipped with a safety relief device meeting the requirements of ANSI/ASHRAE Standard 15.

A6.8.1.4. Each pressure vessel is equipped with an individual shut-off valve at each opening except openings used for safety devices and with no other connection. Close shut-off valves during transportation.

A6.8.1.5. Pressure vessels are manufactured, inspected, and tested according to ANSI/ASHRAE Standard 15, or when over 152.4 mm (6 inches) internal diameter, according to American Society of Mechanical Engineers (ASME) Code.

A6.8.1.6. All parts subject to refrigerant pressure during shipment are tested under ANSI/ASHRAE Standard 15.

A6.8.1.7. The liquid portion of refrigerant, if any, does not completely fill any pressure vessel at 55 degrees C (130 degrees F).

A6.8.1.8. Filling densities prescribed in **A3.3.2.6.** are not exceeded.

A6.8.2. Articles, Pressurized Hydraulic or Pneumatic. The following apply to Articles, Pressurized, Hydraulic or Pneumatic (e.g., accumulators) containing nonliquefied, nonflammable gas, and non-flammable liquids or pneumatic accumulators containing nonliquefied, nonflammable gas, fabricated from materials that do not fragment upon rupture:

A6.8.2.1. Accumulators installed in motor vehicles, construction equipment, and assembled machinery, designed and fabricated with a burst pressure of not less than five times their charged pressure at 21 degrees C (70 degrees F) are exempt from the requirements of this manual.

A6.8.2.2. When charged to not more than 1380 kPa (200 psig) at 21 degrees C (70 degrees F), the following conditions apply:

A6.8.2.2.1. Each article must have a fluid space no exceeding 41L (2,500 cubic inches) under stored pressure.

A6.8.2.2.2. Ship each article as an inside package. There are no specification requirements.

A6.8.2.2.3. Each article must be tested, without evidence of failure or damage, to at least three times its charged pressure at 21 degrees C (70 degrees F) but not less than 120 psig (830 kPa) before initial shipment and before each refilling and reshipment.

A6.8.2.3. When charged over 1380 kPa (200 psig) at 21 degrees C (70 degrees F) the following conditions apply:

A6.8.2.3.1. Each article must have a fluid space no exceeding 41L (2,500 cubic inches) under stored pressure.

A6.8.2.3.2. Each article must be tested, without evidence of failure or damage, to at least three times its charged pressure at 21 degrees C (70 degrees F) but not less than 120 psig (830 kPa) before initial shipment and before each refilling and reshipment.

A6.8.2.3.3. Each article must be designed and fabricated with a burst pressure of not less than five times its charged pressure when shipped.

A6.9. Acetylene Gas must be packaged as follows:

A6.9.1. Handling Instructions. Do not ship or store acetylene in a horizontal position.

A6.9.2. DOT 8 or 8AL Cylinders. Ship in DOT 8 or 8AL cylinders with the following provisions:

A6.9.2.1. Ensure cylinders are filled with a porous material charged with a suitable solvent as identified in 49 CFR, paragraph 178.59 or 178.60.

A6.9.2.2. The specific gravity of acetone solvent in acetylene cylinders must be 0.796 or over at 15.5 degrees C (60 degrees F). The amount of solvent added in the refilling operation must not cause the tare weight of the cylinder to be over its marked tare weight. The tare weight includes the weight of the cylinder shell, porous filling, safety relief devices, valve, and solvent, but without removable cap.

A6.9.2.3. The pressure in cylinders containing acetylene gas must not exceed 1724 kPa at 21 degrees C (250 psig at 70 degrees F); however, if the cylinders are marked for a lower allowable charging pressure at 21 degrees C (70 degrees F), then do not exceed that pressure.

A6.9.3. Foreign Cylinders. Foreign cylinders must meet the requirements of **A3.3.2.6.**

A6.9.4. UN Specification cylinders marked with "USA" as country of approval.

A6.10. Cigarette Lighters or Other Similar Devices Charged With Fuel must be packaged as follows. Do not ship any package containing a cigarette lighter or other similar ignition device charged with fuel and equipped with an ignition element, or any self-lighting cigarette, unless the design of the device and its packaging has been approved according to 2.3 or by the DOT. Ship a cigarette lighter or other similar device charged with a flammable gas according to the following:

A6.10.1. No more than 70 mL (2.3 fluid ounces) of liquefied gas may be loaded into each device.

A6.10.2. The liquid portion of the gas may not be over 85 percent of the volumetric capacity of each chamber at 15 degrees C (59 degrees F).

A6.10.3. Each device including closures must be capable of withstanding, without leakage or rupture, an internal pressure of at least two times the vapor pressure of the fuel at 55 degrees C (130 degrees F).

A6.10.4. Overpack devices in packaging that is designed or arranged to prevent movement of the device itself.

A6.11. Cryogenic Liquids must be packaged as follows:

A6.11.1. Handling Instructions. Store in cool, well-ventilated area away from fire hazards, direct rays of the sun, and organic or easily oxidizable materials such as grease and oil. Handle containers with extreme care. Avoid direct contact.

A6.11.2. Container Requirements:

A6.11.2.1. Do not load a cylinder with a cryogenic liquid colder than the design service temperature of the packaging.

A6.11.2.2. Do not load a cylinder with any material that may combine chemically with any residue in the packaging to produce an unsafe condition.

A6.11.2.3. The jacket covering the insulation on a cylinder used to transport any flammable cryogenic liquid must be made of steel.

A6.11.2.4. Do not install a valve or fitting made of aluminum, with internal rubbing or abrading aluminum parts that may come in contact with oxygen in the cryogenic liquid form, on any cylinder used to transport oxygen, cryogenic liquid unless the parts are anodized according to ASTM Standard B 580.

A6.11.2.5. Do not install an aluminum valve, pipe, or fitting on any cylinder used to transport any flammable cryogenic liquid.

A6.11.2.6. Provide each cylinder with one or more pressure relief devices.

A6.11.2.7. Install each pressure relief device and locate so that the cooling effect of the contents during venting will not prevent effective operation of the device.

A6.11.2.8. The maximum weight of the contents in a cylinder with a design service temperature colder than -195.5 degrees C (-320 degrees F) may not be over the design weight marked on the cylinder.

A6.11.2.9. Each cylinder containing a cryogenic liquid must have a pressure control system that conforms to 49 CFR 173.316 and must be designed and installed so that it will prevent the cylinder from becoming liquid full.

A6.11.3. Venting Requirements. Protect all containers by vent openings or safety relief devices to prevent excessive pressure buildup within the containers. The shipper must provide required equipment and specific venting instructions in the additional handling information block of the Shipper's Declaration for Dangerous Goods (see **A17.4.2.**), unless venting procedures are provided in a separate instruction accompanying the shipment or attached to the cargo. Crew members must monitor vent valves during flight. The following applies:

A6.11.3.1. Provide at least 4.6 m (15 feet) of 25.4 mm (one inch) inside diameter tubing or hose compatible with the product. Do not use rubber tubing for liquid oxygen.

A6.11.3.2. Provide sufficient clamps to attach tubing to the unit, the aircraft vent adapter, and other hoses if more than one unit is transported. Do not use sealing compound on tubing or hose connections.

A6.11.3.3. Provide T fittings and extra tubing or hose for the manifolding of two or more unit to one aircraft vent. Tubing or hose must be routed to ensure freedom from kinks, sharp bends, or restrictions that prevent free venting and cause pressure buildup in the tubing or hose.

A6.11.3.4. Small containers (net capacity of 25 liters (6.6 gallons) or less) charged with a nonflammable, nonpoisonous cryogenic liquid, are excepted from the overboard venting requirement.

A6.11.4. Packaging Requirements. Ensure all containers are designed to hold low temperature liquefied gases and are strong enough to withstand all shocks and loading normally incident to air shipment and associated handling. Ship cryogenic liquids of argon, helium, neon, nitrogen, and oxygen according to filling density requirements in **Figure A3.4.** Ship hydrogen (minimum 95 percent parahydrogen) according to filling density requirements in **Figure A3.5.** Protect container accessories against damage in handling.

A6.11.4.1. DOT 4L cylinders in a vertical position.

A6.11.4.2. Type TMU-27M, MIL-T-38170, or MA-1, trailer mounted, 189 L (50 gallon) capacity containers.

A6.11.4.3. C-1, 1892 L (500 gallons) capacity containers.

A6.11.4.4. Dewars, 25 L (6.6 gallon) capacity each. Not more than 6 per aircraft.

A6.11.4.5. Nonpressurized metal vacuum-type containers, dewars, 100 liter (26.42 gallon capacity) attached to nonskid base. Ship no more than one container per aircraft.

A6.11.4.6. NRU-5/E air-transportable 1514L (400 gallon tank) (MIL-T-38261).

A6.11.4.7. LS-160 container attached to shipping platform. Ship a maximum of one container per aircraft. Maximum 150 liters (39.63 gallons) nitrogen per container.

A6.11.4.8. TMU-70/M (MIL-A-85415) LOX servicing trailers. The trailers must be equipped with absolute pressure relief valve and vented to outside of aircraft.

A6.11.4.9. TMU-24E (MIL-T-27720), mounted on aircraft cargo pallet, 1514 L (400 gallons), liquid oxygen or liquid nitrogen storage and transfer tanks.

A6.11.4.10. LSHe-102, 109 L (28.79 gallon) capacity, attached to shipping skid. Container must be equipped with an absolute pressure relief valve for air shipment. Authorized for liquid helium.

A6.11.4.11. LSHe-30, 30 L (7.92 gallon) capacity, packed in a specially designed shipping container (P/N 0305-0002) equipped with plastic foam pads. Ship no more than five containers per aircraft. Authorized for liquid helium and neon.

A6.11.4.12. LSNe-75, liquid neon container, with a maximum quantity of 75 L (19.81 gallon) attached to a shipping skid. Ship not more than two containers per aircraft. Containers must be equipped with an absolute pressure relief valve.

A6.11.4.13. Liquid oxygen and liquid nitrogen in specification MIL-T-38170 containers vented to the outside of the aircraft. The container vent valve must be monitored by a crewmember to make sure the pressure buildup within the container is not over 40 psig. The container must be vented down to 5 psig whenever necessary during flight and the valve again shut off.

A6.11.4.14. CRU-87/U, 10-liter, Portable Therapeutic Liquid Oxygen (PTLOX) Converters. Up to 25 PTLOX converters per aircraft may be shipped without overboard venting, except that C-21 aircraft is limited to 10 PTLOX converters without overboard venting.

A6.11.4.15. Foreign cylinders meeting the requirements of **A3.3.2.8.**

A6.11.4.16. UN Specification cylinders marked with "USA" as country of approval.

A6.12. Ethyl Chloride must be packaged as follows. Package ethyl chloride in any of the following single or combination nonbulk packagings which meet the PG I performance level. (Outage for all containers must be 7.5 percent or more at 21 degrees C (70 degrees F.)

A6.12.1. Package in wood boxes as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware or metal ***NOTE:*** Must not be over 500 g (17.6 ounces) capacity each	Boxes: ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), or reconstituted wood (4F)

A6.12.2. Package in drums as follows:

Inner packaging	Outer packaging
Inner packaging not required	Drum: steel (1A1) not over 100 L (26 gallon) capacity each

A6.12.3. Package in fiberboard boxes as follows:

Inner Packaging	Outer Packaging
Receptacles: glass, earthenware or metal ***NOTE:*** Must not be over 500 g (17.6 ounces) capacity each.	Box: fiberboard (4G) ***NOTE:*** Gross weight must not exceed 30 kg (66 pounds).

A6.12.4. DOT Cylinders. Any DOT specification cylinder prescribed for any compressed gas except acetylene.

A6.13. Ethylene Oxide must be packaged as follows. Silver mercury, or any of its alloys, or copper must not be used in any part of a packaging, valve, or other packaging appurtenance if that part, during normal conditions of transportation, may come in contact with ethylene oxide liquid or vapor. Copper alloys may be used only where gas mixtures do not contain free acetylene at any concentration that will form copper acetylene. All packaging and gaskets must be constructed of materials which are compatible with ethylene oxide and do not lower the auto-ignition temperature of ethylene oxide. Each completed package must meet PG I performance requirements.

A6.13.1. Package in boxes as follows:

Inner packaging	Outer packaging
glass ampoules / vials	Box: fiberboard (4G) ***NOTE:*** The total quantity of ethylene oxide must not exceed 100 g (3.5 ounces) per pack age.

A6.13.2. Package in boxes as follows:

Inner packaging	Outer packaging
aluminum receptacles ***NOTE:*** The inner packaging must not contain more than 135 g (4.8 ounces).	fiberboard (4G) box constructed with top and bottom pads and perimeter liner ***NOTE:*** Inner aluminum receptacles must be cushioned with an incombustible material. No more than 12 inner packagings may be packed in one fiberboard (4G) box. No more than 10 fiberboard (4G) boxes may be overpacked.

A6.13.3. Package in boxes as follows:

Inner packaging	Outer packaging
metal receptacles ***NOTE:*** The capacity of the inner packaging must not exceed 340 g (12 ounces). The inner packaging must be capable of withstanding a 1124 kPa (180 psig) burst pressure. Each inner packaging must be insulated and equipped with a relief device of the fusible plug type with a yield temperature of 69 to 77 degrees C (156 to 171 degrees F). The capacity of relief device and insulation must be such that the charged receptacle will not explode when tested by the method described in Compressed Gas Association Pamphlet C-14 or other equivalent method. No more than 12 inner packaging may be packed in one outer packaging. Each inner packaging must not be liquid full below 82 degrees C (180 degrees F)	Boxes: wooden (4C1, 4C2, 4D, or 4F) or fiberboard (4G)

A6.13.4. Steel (1A1) Drums. In steel (1A1) drums of no more than 231L (61 gallons). The drum must be lagged, of all welded construction with the inner shell having a minimum thickness of 1.7 mm (0.068 inches) and the outer shell must have a minimum thickness of 2.4 mm (0.095 inches). Drums must be capable of withstanding a hydrostatic test pressure of 690 kPa (100 psig). Lagging must be of sufficient thickness so that the drum, when filled with ethylene oxide and equipped with the required pressure relief device, will not rupture when exposed to fire. The drum may not be liquid full below 85 degrees C (185 degrees F). Before each refilling, each drum must be pressure tested for leakage at no less than 103 kPa (15 psig). Each drum must be equipped with a fusible-type relief device with a yield temperature of 69 to 77 degrees C (157 to 170 degrees F). The capacity of the relief device and the effectiveness of the insulation must be such that the charged cylinder will not explode when tested by the method described in CGA Pamphlet C-14 or other equivalent method.

A6.13.5. DOT Specification Cylinders. In DOT specification cylinders, as authorized for any compressed gas except acetylene. Pressurizing valves and insulation are required for cylinders over 4 L (1 gallon) capacity. Educator tubes must be provided for cylinders over 19 L (5 gallon) capacity. Cylinders must be seamless or welded steel (not brazed) with nominal capacity of no more than 115 L (30 gallons) and may not be liquid full below 82 degrees C (180 degrees F). Before each refilling, each cylinder must be pressure tested for leakage at no less than 103 kPa (15 psig). Each cylinder must be equipped with a fusible-type relief device with a yield temperature of 69 to 77 degrees C (157 to 170 degrees F). The capacity of the relief device and the effectiveness of the insulation must be such that the charged cylinder will not explode when tested by the method described in CGA Pamphlet C-14 or other equivalent method.

A6.14. Ethylamine (Monoethlamine, Aminoethane) must be packaged as follows:

A6.14.1. Use metal drums (1A1) which meet PG I performance level requirements.

A6.14.2. Use any DOT specification cylinder prescribed for any compressed gas except acetylene.

A6.15. Arsine; Cyanogen Chloride, Stabilized; Cyanogen, Liquefied; Germane; Liquefied Gas, Toxic; Phosgene; Phosphine must be packaged as follows. See paragraph **2.8.** for additional information.

A6.15.1. Handling Instructions. These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material.

A6.15.2. Packaging Requirements. Package in DOT specification 3A1800, 3AA1800, 3AL1800, 3D, 3E1800, and 33 cylinders. Specification 3A, 3AA, 3AL, 3D, and 33 cylinders may not exceed 57 kg (125 pounds) water capacity (nominal). Shipments of "Arsine" or "Phosphine" will not be accepted for transportation if packaged in a specification 3AL cylinder. Cylinders containing "phosgene" may not exceed a filling density of 125 percent (see **A3.3.2.6.**). The cylinder may not contain more than 68 kg (150 pounds) of phosgene. Also, each filled cylinder must be tested for leakage before it is offered for transportation and must show absolutely no leakage. This test must consist of immersing the cylinder and valve, without the protection cap attached, in a bath of water at a temperature of approximately 66 degrees C (150 degrees F) for at least 30 minutes. During which time, frequent examinations must be made to identify any escape of gas. After the test has been accomplished the valve of the cylinder must not be loosened before the cylinder is offered for transportation, and must not be loosened during transportation.

A6.16. Bromoacetone; Methyl Bromide; Chloropicrin and Methyl Bromide, or Methyl Chloride Mixtures; Insecticide Gases, Toxic, NOS must be packaged as follows. See paragraph **2.8.** for additional information.

A6.16.1. Handling Instructions. These materials and mixtures are extremely dangerous poisons. Wear approved chemical safety mask and clothing when handling this material.

A6.16.2. Packaging Requirements:

A6.16.2.1. Pack bromoacetone in ordinary wood (4C1), ordinary wood, with sift-proof walls (4C2), plywood (4D), or reconstituted wood (4F), boxes with inner glass receptacles or tubes in hermetically sealed metal receptacles in corrugated fiberboard cartons. Bottles may not contain over 500 g (17.6 ounces) of liquid each and must be cushioned in cans with at least 12.7 mm (.5 inches) of absorbent cushioning material. The total amount of liquid in the outer box must not exceed 11 kg (24 pounds). Packagings must conform to the PG I performance level.

A6.16.2.2. Pack bromoacetone, methyl bromide, chloropicrin and methyl bromide mixtures, chloropicrin and methyl chloride mixtures, and chloropicrin mixtures charged with a nonflammable, nonliquefied compressed gas in DOT specification 3A, 3AA, 3B, 3C, 3E, 4A, 4B, 4BA, 4BW, or 4C cylinders having not over 113 kg (250 pounds) water capacity (nominal). However, this capacity does not apply to shipments of methyl bromide.

A6.16.2.3. Package methyl bromide mixtures containing up to 2 percent chloropicrin in a fiberboard (4G) box with inside metal cans containing not over 0.454 kg (1 pound) each, or inside metal cans with a minimum wall thickness of 0.178 mm (0.007 inch) containing not over 0.7945 kg (1 3/4 pounds) each. The 0.454 kg (1 pound) can must be capable of withstanding an internal pressure of 896.6 kPa (130 psig) without leakage or permanent distortion. Vapor pressure of the

contents must not exceed 896.6 kPa (130 psig) at 55 degrees C (130 degrees F). The 0.7945 kg (1 3/4 pound) can must be capable of withstanding an internal pressure of 965.6 kPa (140 psig) without leakage or permanent distortion. Vapor pressure of the contents must not exceed 965.6 kPa (140 psig) at 55 degrees C (130 degrees F). Cans must not be liquid full at 55 degrees C (130 degrees F). Cans must be constructed of tinplate or lined with suitable material and must have concave or pressure ends.

A6.17. Gas Identification Sets must be packaged as follows. Gas identification sets containing toxic material must meet the requirements of the PG I performance level.

A6.17.1. Pack in hermetically sealed glass inner receptacles not over 40 ml (1.4 fluid ounces). Each glass inner receptacle must be placed in a sealed fiberboard receptacle cushioned with absorbent material. Not more than 12 fiberboard receptacles may be placed in a 4G fiberboard box. No more than four fiberboard boxes, well-cushioned, may be placed in a steel cylinder. The cylinder must have a wall thickness of at least 3.7 mm (0.146 inches) and must have a hermetically sealed steel closure.

A6.17.2. When the toxic material is absorbed in a medium such as activated charcoal or silica gel, pack gas identification sets as follows:

A6.17.2.1. If the liquid toxic material does not exceed 5 ml (0.2 fluid ounces) or the solid toxic material does not exceed 5 g (0.2 ounces), they may be packed in glass inner receptacles of not over 120 ml (4.1 fluid ounces) each. Each glass receptacle, cushioned with absorbent material, must be packed in a hermetically sealed metal can. The metal can must have a wall thickness of not less than 0.30 mm (0.012 inch). Then the metal cans must be packed in wooden boxes (4C1, 4C2, 4D, or 4F) surrounded on all sides by at least 25 mm (1 inch) of dry sawdust. Not more than 100 ml (3.4 fluid ounces) or 100 g (3.5 ounces) of toxic materials may be packed in one outer wooden box.

A6.17.2.2. If the liquid toxic material does not exceed 5 ml (0.2 fluid ounces) or the solid toxic material does not exceed 20 g (0.7 ounces), they may be packed in glass inner receptacles with screw-top closures of not less than 60 ml (2 ounces) that are hermetically sealed. Twelve bottles containing toxic material not exceeding 100 ml (3.4 ounces) for liquids or 100 g (3.5 ounces) for solids may be placed in a plastic carrying case. Each glass receptacle must be surrounded by absorbent cushioning material and must also be separated from each other by sponge rubber partitions. The plastic carrying case must be placed in a tightly fitted fiberboard box and then placed in a tight fitting wooden box (4C1, 4C2, 4D, or 4F).

A6.18. Hexaethyl Tetraphosphate and Compressed Gas Mixtures; Insecticide Gases, Toxic, NOS; Parathion and Compressed Gas Mixture; Tetraethyl Dithiopyrophosphate and Gases, in Solution or Tetraethyl Dithiopyrophosphate and Gases, Mixtures (LC50 Less Than or Equal to 200 Parts Per Million (ppm)); Tetraethyl Dithiopyrophosphate and Gases, in Solution or Tetraethyl Dithiopyrophosphate and Gases, Mixtures (LC50 over 200 but not Greater Than 5000 ppm); Tetraethyl Pyrophosphate and Compressed Gas Mixture (LC50 Less Than or Equal to 200 ppm); Tetraethyl Pyrophosphate and Compressed Gas Mixture (LC50 Over 200 but not greater than 5000 ppm) must be packaged as follows. See paragraph **2.8.** for additional information.

A6.18.1. Handling Instructions. These materials and mixtures are extremely dangerous poisons. Wear approved chemical safety mask and clothing when handling this material.

A6.18.2. Packaging Requirements.

A6.18.2.1. Hexaethyl tetraphosphate, parathion, tetraethyl dithiopyrophosphate, and tetraethyl pyrophosphate may be mixed with a nonflammable compressed gas. This mixture must not contain more than 20 percent by weight of an organic phosphate and must be packaged in DOT specification 3A240, 3AA240, 3B240, 4A240, 4B240, 4BA240, or 4BW240 cylinders meeting the following requirements:

A6.18.2.1.1. Each cylinder must not be charged with more than 5 kg (11.0pounds) of the mixture. The maximum filling density of the cylinder must not exceed 80 percent of its water capacity.

A6.18.2.1.2. Each cylinder must be charged in compliance with **A3.3.2.6.**

A6.18.2.1.3. No cylinder may be equipped with an education tube or a fusible plug.

A6.18.2.1.4. No cylinder may be equipped with any valve unless the valve is a type approved by the DOT.

A6.18.2.2. Cylinders must be overpacked in a fiberboard box (4G) and packaged in a way to protect each valve or other closing device from damage. Except as provided in **A6.17.2.2.**, no more than four cylinders may be packed in a box. Each box with its closing device protection must be sufficiently strong to protect all parts of each inside cylinder from deformation or breakage if the completed package is dropped 1.8 m (5.9 feet) onto solid concrete impacting at the package's weakest point.

A6.18.2.3. Cylinders may be packed in a strong wooden box (4C1, 4C2, 4D, or 4F) and packed in a way to protect each valve or other closing device from damage. No more than twelve cylinders may be packed in one outer wooden box. Each wooden box with its closing device protection must be sufficiently strong to protect all parts of each inside cylinder from deformation or breakage if the completed package is dropped 1.8 m (5.9 feet) onto solid concrete impacting at the package's weakest point.

A6.19. Packaging for Class 2.3 Materials, Poisonous by Inhalation (Hazard Zone A) must be packaged as follows.

A6.19.1. Handling Instructions. These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material.

A6.19.2. Packaging Requirements. Package Class 2.3, PG I materials with an Inhalation Hazard Zone A as follows:

A6.19.2.1. In DOT cylinders as identified in 49 CFR, part 178, subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of **A3.3.2.**

A6.19.2.2. Pack in an inner drum (1A1, 1B1, 1H1, 1N1, or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The outer 1A2 and 1H2 drums must withstand a hydrostatic test pressure of 100 kPa (15 psi). The capacity of the inner drum must not exceed 220 L (58 gallons). The inner drum must also meet the following requirements:

A6.19.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).

A6.19.2.2.2. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (130 degrees F) of at least twice the vapor pressure of the material to be packaged.

A6.19.2.2.3. Have screw-type closures that are:

A6.19.2.2.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A6.19.2.2.3.2. Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation.

A6.19.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A6.19.2.2.4. Meet the following minimum thickness requirements:

A6.19.2.2.4.1. If the capacity of the inner drum is less than or equal to 120 L (32 gallons) the minimum thickness of the inner drum is: 1.3 mm (0.051 inches) for 1A1 and 1N1 drums, 3.9 mm (0.154 inches) for 1B1 drums, 3.16 mm (0.124 inches) for 1H1 drums, 1.58 mm (0.0622 inches) for the plastic inner container and 0.96 mm (0.0378) for the outer steel drum of a 6HA1 drum.

A6.19.2.2.4.2. If the capacity of the inner drum is greater than 120 L (32 gallons) the minimum thickness of the inner drum is: 1.7 mm (0.067 inches) for 1A1 and 1N1 drums, 4.7 mm (0.185 inches) for 1B1 drums, 3.16 mm (0.124 inches) for 1H1 drums, 1.58 mm (0.0622 inches) for the plastic inner container and 1.08 mm (0.0378) for the outer steel drum of a 6HA1 drum.

A6.19.2.2.5. Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum.

A6.19.2.3. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal securely cushioned with a nonreactive absorbent material. The package must be packed within a leak-tight packaging of metal or plastic, then packed in a steel drum (1A2), aluminum drum (1B2), metal drum (other than steel or aluminum (1N2)), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2.) The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure, must have the closure held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A6.20. Nitric Oxide must be packaged as follows. See paragraph **2.8.** for additional information.

A6.20.1. Handling Instructions. Nitric oxide is extremely dangerous and poisonous. Wear an approved safety mask and clothing when handling this material.

A6.20.2. Packaging Requirements. Pack nitric oxide in DOT 3A1800, 3AA1800, 3E1800, or 3AL1800 cylinders, charged to a pressure of not more than 5,170 kPa (750 psi) at 21 degrees C (70 degrees F). Cylinders must be equipped with a valve of stainless steel and a valve seat of material that is not deteriorated by contact with nitric oxide or nitrogen dioxide. Cylinders or valves must not be equipped with safety devices (pressure relief) of any type. Ensure valve outlets are sealed by a solid threaded cap or plug and an inert gasketing material. Each cylinder must be cleaned as identified in 49 CFR, 173.337(b).

A6.20.2.1. Pack cylinders, DOT 3E1800, in strong wooden boxes to protect valves from injury or accidental functioning under conditions incident to transportation.

A6.20.2.2. Cylinders, DOT 3A, 3AA, and 3AL, must have their valves protected by metal caps, or other equally protective guards, securely attached to the cylinders and be of sufficient strength to protect the valves from injury or accidental functioning under conditions incident to transportation.

A6.21. Ethyl Methyl Ether must be packaged as follows. Each packaging must meet the requirements of the PG I performance level.

A6.21.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, metal or glass ampoules	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G), or plastic (1H1 or 1H2)

A6.21.2. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, metal or glass ampoules	Jerricans: steel (3A1 or 3A2), plastic (3H1 or 3H2)

A6.21.3. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, metal or glass ampoules	Boxes: steel (4A1 or 4A2), aluminum (4B1 or 4B2), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2)

A6.21.4. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2) or plastic (1H1 or 1H2)

A6.21.5. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A6.21.6. Package in the following single composite packages:

Inner receptacle	Outer packaging
plastic	Drums: steel, aluminum, fiber or plastic (6HA1, 6HB1, 6HG1, 6HH)

A6.21.7. Package in the following single composite packages:

Inner receptacle	Outer packaging
plastic	Boxes: steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, 6HG2)

A6.21.8. Package in the following single, composite packages:

Inner receptacle	Outer packaging
glass, porcelain, or stoneware	Drums: steel, aluminum or fiber (6PA1, 6PB1, 6PG1)

A6.21.9. Package in the following single, composite packages:

Inner receptacle	Outer packaging
glass, porcelain, or stoneware	Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, 6PG2)

A6.21.10. Package in the following single, composite packages:

Inner receptacle	Outer packaging
glass, porcelain, or stoneware	solid or expanded plastic packaging (6PH1 or 6PH2)

A6.21.11. DOT Cylinders. Any DOT specification cylinders as prescribed for any compressed gas, except for acetylene.

A6.22. Gas Generator Assemblies must be packaged as follows. Package gas generator assemblies (aircraft) containing liquefied non-flammable, non-toxic gas and a solid propellant cartridge as follows:

A6.22.1. Package the gas in specification steel cylinders authorized for any compressed gas except acetylene not exceeding 10.5L (2.8 gallons) internal volume and having a minimum design burst pressure of 19,000 kPa (2,857 psi).

A6.22.2. Protect fittings against damage under conditions normal to transport, any trigger must be fitted with a safety locking pin, and a non-propulsive plug must be installed on the discharge tube; and

A6.22.3. Individually and tightly pack each complete unit to prevent movement in wooden boxes (4C1 or 4C2), plywood boxes (4D), reconstituted wood boxes (4F), fiberboard boxes (4G), or plastic boxes (4H1 and 4H2) of PG II performance level, or in the original manufacturer's transit box.

Attachment 7

CLASS 3--FLAMMABLE LIQUIDS

A7.1. General Requirements. This attachment contains information concerning the packaging for Class 3 material (flammable liquids). See **Attachment 3** for other details concerning Class 3 material.

A7.2. Packaging for Class 3 Materials. Class 3 materials must be packaged as follows.

A7.2.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, or metal	Drums: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), plastic (1H1), or removable head plastic (1H2)

A7.2.2. Package in barrels as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, or metal	Barrel: wooden (2C2) ***NOTE:*** Not authorized for PG I material.

A7.2.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, or metal	Jerricans: steel (3A1), removable head steel (3A2), plastic (3H1), plastic removable head (3H2), aluminum (3B1), or aluminum removable head (3B2)

A7.2.4. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, or metal	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)

A7.2.5. Package in the following drums:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal drum other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), fiber (1G) with liner, or plastic (1H1 or 1H2) ***NOTE:*** Fiber drum with liner only authorized for PG III material.

A7.2.6. Package in the following barrel:

Inner packaging	Outer packaging
Not required	Barrel: wooden (2C1) ***NOTE:*** _ Not authorized for PG I material.

A7.2.7. Package in the following jerricans:

Inner packaging	Outer packaging
Not required	Jerricans: steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A7.2.8. Package in the following composite packages:

Inner receptacle	Outer packaging
plastic	Drum: steel, aluminum, fiber, plastic or plywood (6HA1, 6HB1, 6HG1, 6HH1, or 6HD1) ***NOTES:*** Plywood drum (6HD1) only authorized for PG II or PG III

A7.2.9. Package in the following composite packages:

Inner receptacle	Outer packaging
plastic	Boxes: steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2 or 6HG2)

A7.2.10. Package in drums as follows:

Inner packaging	Outer packaging
Receptacle: glass, porcelain or stoneware	Drum: steel, aluminum, fiber, plywood drum (6PA1, 6PB1, 6PG1 or 6PD1) or wickerwork hamper (6PD2) ***NOTE:*** _ Plywood drum (6PD1) and wicker work hamper (6PD2) only authorized for PG II or PG III.

A7.2.11. Package in the following composite packages:

Inner receptacle	Outer packaging
Receptacle: glass, porcelain or stoneware	Box: steel (6PA2), aluminum (6PB2), wooden (6PC), fiberboard (6PG2), solid plastic (6PH1), or expanded plastic packaging (6PH2)

A7.2.12. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A7.2.13. BLU-27/BLU-32 Firebombs must be packaged as follows. Pack BLU-27 firebombs according to SPI 1325-912-3175. Pack BLU-32 firebombs according to SPI 1325-912-3175 or SPI 1325-483-3035. Do not stack containers more than two high for air transportation. Ship firebombs as flammable liquids, NOS.

A7.2.14. DOT 5L Jerrican. DOT 5L jerry cans must be completely drained to the maximum extent possible.

A7.2.15. MIL-D-23119 Drum. MIL-D-23119 500-gallon capacity collapsible fabric drums authorized under mobility operations conducted according to DOD 4500.9R, Defense Transportation Regulation, Part III. Five hundred (500) gallon fabric drums shipped on other than mobility missions must be drained to the greatest extent possible.

A7.2.16. Bulk Fuel. Except as authorized in this manual, servicing trucks, trailers, semitrailers, or storage tanks containing bulk fuel, or any bulk hazardous material must not be transported by air. The following draining/purging requirements apply, as appropriate:

A7.2.16.1. Purge bulk tanks for all liquids with a flash point below 38 degrees C (100 degrees F), regardless of whether the technical manual only requires draining. If other hazardous materials are present, certify to the appropriate packaging paragraph. If no other hazards are present, comply with paragraph **1.10.4.** to identify purged tanks.

A7.2.16.2. Drain, but need not purge, liquids with a flash point at or above 38 degrees C (100 degrees F), unless the technical manual specifically requires purging. If other hazardous materials are present, certify to the appropriate packaging paragraph.

A7.3. Refrigerating Machines must be packaged as follows: A refrigerating machine assembled for shipment and containing 7 kg (15 pounds) or less of flammable liquid for operation in a strong, tight receptacle is excepted from specification packaging, marking, and labeling except for the PSN of the flammable liquid.

A7.4. Aircraft Hydraulic Power Unit Fuel Tank must be packaged as follows:

A7.4.1. Handling Instructions. In the event of a leak during transportation of hydrazine, crew members should use their aircraft oxygen masks in a positive pressure mode.

A7.4.2. Packaging Requirements. Aircraft hydraulic power unit fuel tanks containing a mixture of anhydrous hydrazine and monomethyl hydrazine (M86 fuel) and designed for installation as complete units in aircraft are excepted from specification packaging requirements if the units comply with one of the following:

A7.4.2.1. The unit must consist of an aluminum pressure vessel made from tubing and having welded heads. Primary containment of the fuel within this vessel must consist of a welded aluminum bladder having a maximum internal volume of 46 L (12 gallons). The outer vessel must have a minimum design gauge pressure of 1.275 kPa (185 psi) and a minimum burst gauge pressure of 2.755 kPa (400 psi). Each vessel must be leak-checked during manufacture and before shipment and must be found leak proof. The complete inner unit must be securely packed in noncombustible cushioning material, in a strong outer tightly closed metal packaging that will adequately protect all fittings. The maximum quantity of fuel per unit and package is 42 L (11 gallons).

A7.4.2.2. The unit must consist of an aluminum pressure vessel. Primary containment of the fuel within this vessel must consist of a welded hermetically sealed fuel compartment with an elastomeric bladder having a maximum internal volume of 46 L (12 gallons). The pressure vessel must have a minimum design gauge pressure of 5.17 kPa (750 psi). Each vessel must be leak-checked during manufacture and before shipment and must be found leak proof. The complete inner unit must be securely packed in noncombustible cushioning material, in a strong outer tightly closed

metal packaging that will adequately protect all fittings. The maximum quantity of fuel per unit and package is 42 L (11 gallons).

A7.5. Packaging for Class 3 Materials, Poisonous by Inhalation (Hazard Zone A or B). Class 3 materials with an Inhalation Hazard (Hazard Zone A and B) must be packaged as follows:

A7.5.1. DOT Cylinders. Package in DOT specification cylinders as identified in 49 CFR, part 178, subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of **A3.3.2.**

A7.5.2. Pack in an inner drum (1A1, 1B1, 1N1, 1H1, or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, or 1N1) must not exceed 220 L (58 gallons). Cushion the inner drum within the outer drum with a shock-mitigating, non-reactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum. There must also be at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet all of the following requirements:

A7.5.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).

A7.5.2.2. Satisfactorily withstand a leak proof test (as outlined in 49 CFR, 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A7.5.2.3. Have screw-type closures that meet all the following requirements:

A7.5.2.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A7.5.2.3.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A7.5.2.4. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A7.5.2.5. Meet the following minimum thickness requirements:

A7.5.2.5.1. 1A1 and 1N1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.3 mm (0.051 inches). 1B1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches).

A7.5.2.5.2. 1A1 and 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.7 mm (0.067 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches).

A7.5.3. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal securely cushioned with a non reactive absorbent material. The package must be packed within a leak-tight packaging of metal or plastic, then packed in a steel drum (1A2),

aluminum drum (1B2), metal drum (other than steel or aluminum (1N2)), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2). The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure must have a screw-type closure, which is held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A7.5.4. This paragraph is only authorized for Crotonaldehyde, Stabilized; Diketene, Stabilized; Dimethylhydrazine, Symmetrical; Isopropyl Cloroformate and Methyl Orthosilicate. Pack in metal drums (1A1, 1B1, or 1N1), or plastic drum (1H1), then place in metal drums (1A2 or 1H2), or a plastic receptacle with outer steel drum (6HA1). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, 1N1, or 1H1) must not exceed 220 L (58 gallons). Cushion the inner drum within the outer drum with a shock-mitigating, non reactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum. There must also be at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must meet all of the following requirement.

A7.5.4.1. Satisfactorily withstand a leak-proof test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A7.5.4.1.1. Have screw-type closures that meet all the following requirements:

A7.5.4.1.2. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A7.5.4.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A7.5.4.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A7.5.4.4. Meet the following minimum thickness requirements:

A7.5.4.4.1. 1A1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 0.69 mm (0.027 inches). 1B1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 2.79 mm (0.110 inches). 1H1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.14 mm (0.045 inches). 6HA1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.96 mm (0.038 inches) for the outer steel drum.

A7.5.4.4.2. 1A1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.08 mm (0.043 inches). 1B1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches). 1H1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.125 inches). 6HA1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.96 mm (0.038 inches) for the outer steel drum.

A7.5.4.4.3. 1A1 or 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.35 mm (0.053 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches). 1H1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.124 inches). 6HA1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 1.08 mm (0.43 inches) for the outer steel drum.

A7.6. Polyester Resin Kits must be packaged as follows. Polyester resin and fiberglass repair kits consist of two components: a base material in Class 3, PG II or III, and an organic peroxide activator. Only organic peroxides of Type D, E, or F not requiring temperature controls are authorized. Assign PG II or III according to the criteria for Class 3, applied to the base material. Ensure each component is separately packed in an inner packaging. The components may be placed in the same outer packaging provided they will not react dangerous in the event of leakage.

A7.6.1. Package organic peroxides in drums as follows:

Inner packaging	Outer packaging
plastic tube packaging *or* flexible tube packaging *or* ***NOTE:*** Maximum quantity of organic peroxide per inner packaging is 125 ml (4.22 ounces) for liquids and 500 g (1 lb.) for solids.	Drums: steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), or plastic (1H2)

A7.6.2. Package organic peroxides in jerricans as follows:

Inner packaging	Outer packaging
plastic tube packaging *or* flexible tube packaging *or* ***NOTE:*** Maximum quantity of organic peroxide per inner packaging is 125 ml (4.22 ounces) for liquids and 500 g (1 lb.) for solids.	Jerricans: steel (3A2) or plastic (3H2)

A7.6.3. Package organic peroxides in boxes as follows:

Inner packaging	Outer packaging
plastic tube packaging *or* flexible tube packaging *or* ***NOTE:*** Maximum quantity of organic peroxide per inner packaging is 125 ml (4.22 ounces) for liquids and 500 g (1 lb.) for solids.	Boxes: fiberboard (4G), wooden (4C1 or 4C2), reconstituted wood (4F), plywood (4D), or plastic (4H2)

A7.6.4. Package flammable liquids in drums as follows:

Inner packaging	Outer packaging
Receptacle: glass or earthenware, plastic, metal or aluminum	Drums: steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), or plastic (1H2)

A7.6.5. Package flammable liquids in jerricans as follows:

Inner packaging	Outer packaging
Receptacle: glass or earthenware, plastic, metal or aluminum	Jerricans: steel (3A2) or plastic (3H2)

A7.6.6. Package flammable liquids in boxes as follows:

Inner packaging	Outer packaging
Receptacle: glass or earthenware, plastic, metal or aluminum	Boxes: fiberboard (4G), wooden (4C1 or 4C2), reconstituted wood (4F), plywood (4D), or plastic (4H2)

Attachment 8

CLASS 4--FLAMMABLE SOLIDS, SPONTANEOUSLY COMBUSTIBLE MATERIAL, AND DANGEROUS WHEN WET MATERIAL

A8.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 4.1 (flammable solids), Class 4.2 (spontaneously combustible material), and Class 4.3 (dangerous when wet material). See **Attachment 3** for other details concerning Class 4 material.

A8.2. Packaging for Class 4 Liquids. Class 4 liquids must be packaged as follows.

A8.2.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, or metal	Drums: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), plastic (1H1), or removable head plastic (1H2)

A8.2.2. Package in barrels as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, or metal	Barrel: wood (2C2) ***NOTE:*** _ Not authorized for PG I material.

A8.2.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, or metal	Jerrican: steel (3A1), removable head steel (3A2), plastic (3H1), plastic removable head (3H2), aluminum (3B1), or aluminum removable head (3B2)

A8.2.4. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, or metal	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expended plastic box (4H1), solid plastic (4H2)

A8.2.5. Package in the following drums:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), fiber (1G) with liner, plastic (1H1), and removable head plastic ***NOTE:*** Fiber drum (1G) not authorized for PG 1 materials.

A8.2.6. Package in the following barrels:

Inner packaging	Outer packaging
Not required	Barrel: wood (2C1) ***NOTE:*** Not authorized for PG 1 materials.

A8.2.7. Package in the following composite packages:

Inner receptacle	Outer packaging
plastic	Drum: steel, aluminum, plywood, fiber or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) ***NOTE:*** Plywood (6HD1) not authorized for PG I material.

A8.2.8. Package in the following composite packages:

Inner receptacle	Outer packaging
plastic	Box: steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2 or 6HG2)

A8.2.9. Package in the following composite packages:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	Drum: steel, aluminum, fiber, plywood or wickerwork hamper (6PA1, 6PB1, 6PG1, 6PD1 or 6PD2) ***NOTE:*** Plywood drum or wickerwork hamper (6PD1 or 6PD2) not authorized for PG I material.

A8.2.10. Package in the following composite packages:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	Box: steel, aluminum, wooden, fiberboard, or expanded plastic packaging (6PA2, 6PB2, 6PC, 6PG2, 6PH1, or 6PH2)

A8.2.11. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A8.3. Packaging for Class 4 Solids. Class 4 solids must be packaged as follows. See also **A3.3.4.2.**

A8.3.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, metal or glass ampoules	Drums: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal drum other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), plastic (1H1), or removable head plastic (1H2)

A8.3.2. Package in barrels as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, metal or glass ampoules	Barrel: wood (2C2)

A8.3.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, metal or glass ampoules	Jerrican: steel (3A1), removable head steel (3A2), plastic (3H1), plastic removable head (3H2), aluminum (3B1) or aluminum removable head (3B2)

A8.3.4. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, metal or glass ampoules	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic (4H2)

A8.3.5. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal drum other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), plastic (1H1), or removable head plastic (1H2) ***NOTE:*** Plywood (1D) not authorized for PG I material.

A8.3.6. Package in barrels as follows:

Inner packaging	Outer packaging
Not required	Barrel: wood (2C2) ***NOTE:*** Not authorized for PG I material.

A8.3.7. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerrican: steel (3A1), removable head steel (3A2), plastic (3H1), plastic removable head (3H2), aluminum (3B1) or aluminum removable head (3B2)

A8.3.8. Package in boxes as follows:

Inner packaging	Outer packaging
Not required	Boxes: steel (4A), steel (4A) with liner, aluminum (4B), , aluminum (4B) with liner, ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic (4H2 or 4H1)

A8.3.9. Package in bags as follows:

Inner packaging	Outer packaging
Not required	Bags: woven plastic (5H1, 5H2, or 5H3); plastic film (5H4); textile (5L1, 5L2, or 5L3); paper, multiwall, water-resistant (5M2) ***NOTE:*** Not authorized for PG I material.

A8.3.10. Package in the following composite packages:

Inner receptacle	Outer packaging
plastic	Drum: steel, aluminum, plywood, fiber or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1)

A8.3.11. Package in the following composite packages:

Inner receptacle	Outer packaging
plastic	Box: steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2 or 6HG2)

A8.3.12. Package in the following composite packages:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	Drum: steel, aluminum, plywood or fiber (6PA1, 6PB1, 6PD1 or 6PG1)

A8.3.13. Package in the following composite packagings:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	Box: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC or 6PG2)

A8.3.14. Package in the following composite packages:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	expanded plastic packaging (6PH1 or 6PH2)

A8.4. Class 4 Materials requiring CAA. Prepare Class 4 materials referenced in **Table A4.1.** to this paragraph, according to a competent authority approval (CAA). Packaging must be in compliance with the CAA. See paragraph **2.5.** for more information on CAAs.

A8.5. Pyrophoric Liquid Materials (Class 4.2). Pyrophoric liquid materials must be packaged as follows. See also **A3.3.4.2.**

A8.5.1. Steel or Nickel Cylinders. Specification steel or nickel cylinders prescribed for any compressed gas except acetylene having a minimum design pressure of 1206 kPa (175 psi). The following applies:

A8.5.1.1. Cylinders with valves must be equipped with steel valve protection caps or collars, or

A8.5.1.2. Pack in wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), or plastic box (4H1 or 4H2). Secure cylinders to prevent movement in the box and when offered for transportation, load so that the pressure relief devices remain in the vapor space of the cylinder.

A8.5.2. Boxes. Wooden boxes (4C1, 4C2, 4D, or 4F), or fiberboard boxes (4G) with not more than four strong, tight metal cans with inner receptacles of glass or metal. Inner receptacles must not be over 1 L (0.3 gallons) capacity each. Inner receptacles must have a positive screw cap closure with gasket. Cushion inner packagings on all sides with dry, incombustible absorbent cushioning material in a quantity sufficient to absorb the entire contents. The strong, tight metal cans must be closed by positive means, not by friction.

A8.5.3. Drums. Steel drums (1A2) or fiber drums (1G) not exceeding 220 L (58 gallons) capacity each with inner metal cans not over 4 L (1 gallon) capacity each, closed by positive means, not by friction. The following additional requirements must be met:

A8.5.3.1. Inner packaging must have no opening exceeding 25 mm (1 inch) in diameter and must be surrounded with non combustible absorbent cushioning material.

A8.5.3.2. Net quantity of pyrophoric liquids must not exceed two-thirds of the rated capacity of the outer drum. For example, a 220 L (58 gallon) outer drum must not contain more than 147 L (39 gallons) of pyrophoric liquids.

A8.5.3.3. A metal plate separator in addition to the noncombustible absorbent cushioning material must separate each layer of inner packagings.

A8.6. Diphenyloxide-4, 4-Disulphohydrazide; N, N Dinitroso-N, N Dimethyl Teraphthlamide (not more than 72 percent as a paste) must be packaged as follows. Temperature controls are not required. Maximum gross weight must not exceed 110 pounds (50 kg).

A8.6.1. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: fiber (1G) with a plastic liner or internal coating

A8.6.2. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: sift-proof fiber (1G)

A8.7. 1,1 Azodi-(Hexahydrobenzonitrile); Benzene Sulfohydrazide; Benzene-1,3-Disulfohydrazide (not more than 52 percent as a paste); N,N-Dinitrosopentamethylenetetramine (not more than 82 percent with phlegmatizer) must be packaged as follows. Temperature controls are not required.

A8.7.1. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: fiber (1G) with a plastic liner or internal coating ***NOTE:*** Maximum gross weight is 50 kg (110 pounds).

A8.7.2. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacle: single plastic bag	Box: fiberboard (4G) ***NOTE:*** Maximum gross weight is 50 kg (110 pounds).

A8.7.3. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: plastic boxes, plastic bottles, or jars ***NOTE:*** _ Maximum weight of inner packaging is 5 kg (11 pounds).	Box: fiberboard (4G) ***NOTE:*** Maximum gross weight is 40 kg (88 pounds).

A8.7.4. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: sift-proof fiber (1G) ***NOTE:*** Maximum gross weight is 55 kg (110 pounds).

A8.8. 3-Chloro-4-Diethylaminobenzenediazonium Zinc Chloride; 4-Dipropylaminobenzenediazonium Zinc Chloride; Sodium 2-Diazo-1Naphthol-4-Sulphonate; Sodium 2-Diazo-1-Naphthol-5-Sulphonate must be packaged as follows. Temperature controls are not required.

A8.8.1. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: fiber (1G) with a plastic liner or internal coating ***NOTE:*** Maximum gross weight is 50 kg (110 pounds).

A8.8.2. Package in drums as follows:

Inner packaging	Outer packaging
Receptacle: plastic bag	Drums: steel removable head (1A2) or an aluminum removable head (1B2) ***NOTE:*** Maximum gross weight is 55 kg (121 pounds).

A8.9. 2-Diazo-1-Naphthol-4-Sulphochloride and 2-Diazo-1-Naphhthol-5-Sulphochloride. Temperature controls are not required. Must be packaged in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: fiber (1G) with plastic liner or internal coating ***NOTE:*** Maximum gross weight is 50 kg (110 pounds).

A8.10. Barium Azide, Wetted (with not less than 50 percent water by mass) must be packaged as follows. Pack barium azide, wetted (with not less than 50 percent water by mass) in the following packaging. Inner glass receptacles must not be over 0.5 kg (1.1 pounds) capacity each. Inner receptacles must have rubber stoppers wire-tied for securement. If transportation is to take place when freezing weather is possible, a suitable antifreeze solution must be used to prevent freezing.

A8.10.1. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: glass	Boxes: wood (4C1, 4C2, 4D, or 4F)

A8.10.2. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: glass	Drum: fiber (1G)

A8.11. Calcium Pyrophoric; Magnesium Diphenyl; Metal Catalyst, Dry; Pyrophoric Metals, NOS and Pyrophoric Solids, NOS must be packaged as follows.

A8.11.1. Inner receptacles must have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 15 kg (33 pounds) each. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: metal	Boxes: wood (4C1, 4C2, 4D, or 4F)

A8.11.2. Inner receptacles must have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 7.5 kg (17 pounds) each. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: metal	Box: fiberboard (4G)

A8.11.3. Inner receptacles must have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 15 kg (33 pounds) each. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: metal	Drums: fiber (1G) or plywood (1D)

A8.11.4. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: steel (1A1 or 1A2) ***NOTE:*** Gross weight must not exceed 150 kg (331 pounds) each.

A8.11.5. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: metal ***NOTE:*** Maximum net weight for each inner packaging is 15 kg (33 pounds). Inner packages shall be hermetically sealed and have threaded closures	Boxes: steel (4A)

A8.12. Films, Nitrocellulose Base (gelatin coated [except scrap]) must be packaged as follows. Each reel must be in a tightly closed inner packaging with its cover securely held in place with adhesive tape or adhesive paper.

A8.12.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: metal can, polypropylene canister, or strong fiberboard	Drums: steel (1A1), aluminum (1B2), or plywood (1D) *or* Jerrican: steel (3A2) *or* Boxes: wood (4C1 or 4C2), plywood (4D), or reconstituted wood (4F)

A8.12.2. Film Not Exceeding 600 m (1969 feet). Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: metal can, polypropylene canister, or strong fiberboard	Box: fiberboard (4G) *or* Drum: fiber (1G)

A8.13. Fusees (railway or highway) must be packaged as follows.

A8.13.1. General Requirements. Fusees that are equipped with spikes must have reinforced ends to prevent penetration of the spikes through the outer packaging. Also, the packages must be capable of passing at least one drop test with the spike in a downward position.

A8.13.2. Packaging Requirements.

A8.13.2.1. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A2), plywood (1D), or fiber (1G)

A8.13.2.2. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerrican: steel (3A2)

A8.13.2.3. Package in boxes as follows:

Inner packaging	Outer packaging
Not required	Boxes: wood (4C1, 4C2), plywood (4D), reconstituted (4F), fiberboard (4G)

A8.14. Matches, Fusee; Matches, Safety (book, card, or strike-on-box); Matches Strike-Anywhere, and Matches, Wax Vesta must be packaged as follows. Matches must be of a type that will not ignite spontaneously when subjected to a temperature of 93.3 degrees C (200 degrees F) for 8 consecutive hours in a properly conducted laboratory test.

A8.14.1. Do not pack matches, strike-anywhere, in the same outer packaging with any other article except safety matches or wax vesta matches. The safety matches or wax vesta matches must be packaged in separate inside containers. Each inside packaging must not contain over 700 matches. Gross weight must not be over 27.2 kg (60 pounds) for fiberboard boxes or 45.4 kg (100 pounds) for all other outer packagings.

A8.14.1.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	Drums: steel (1A2), aluminum (1B2), plywood (1D) or fiber (1G)

A8.14.1.2. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	Jerrican: steel (3A2)

A8.14.1.3. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	Boxes: wood (4C1, 4C2), plywood (4D), reconstituted (4F) or fiberboard (4G)

A8.14.2. Do not pack fusee matches, in the same outer packaging with any other article except safety matches or wax vesta matches. The safety matches or wax vesta matches must be packaged in separate inside containers. Each inside packaging must not contain over 700 matches. Gross weight must not be over 27.2 kg (60 pounds) for fiberboard boxes or 45.4 kg (100 pounds) for all other outer packagings.

A8.14.2.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	Drums: steel (1A2), aluminum (1B2), plywood (1D) or fiber (1G)

A8.14.2.2. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	Jerrican: steel (3A2)

A8.14.2.3. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	Boxes: wood (4C1, 4C2), plywood (4D), reconstituted (4F) or fiberboard (4G)

A8.14.3. Tightly pack safety matches (strike-on-box, book, and card) or wax vesta matches in securely closed inside containers then packed in an outer packaging. Safety matches may be packed in the same outer packaging with non hazardous materials.

A8.14.3.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	Drums: steel (1A2), aluminum (1B2), plywood (1D), or fiber (1G)

A8.14.3.2. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	Jerrican: steel (3A2)

A8.14.3.3. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	Boxes: wooden (4C1, 4C2), plywood (4D), reconstituted (4F), fiberboard (4G)

A8.15. Pentaborane must be packaged as follows. Package in any DOT specification cylinder, except those specified for acetylene.

A8.16. Phosphorus, White or Yellow, Dry, or Under Water, or in Solution must be packaged as follows. The packaging requirements are:

A8.16.1. Phosphorus White or Yellow. Phosphorus white or yellow, when dry, must be cast solid and shipped in containers as follows:

A8.16.1.1. Steel drums (1A2) not over a 115 L (30 gallons) capacity each.

A8.16.1.2. In projectiles or bombs without bursting elements.

A8.16.2. Phosphorus White or Yellow in Water or Solution. Pack phosphorus, white or yellow, when in water or solution, in:

A8.16.2.1. Wooden boxes (4C1, 4C2, 4D, or 4F) with inside soldered or hermetically-sealed metal cans placed inside another soldered or hermetically-sealed metal can.

A8.16.2.2. Wooden boxes (4C1, 4C2, 4D, or 4F) with inside water-tight metal cans containing not over .45 kg (1 pound) of phosphorus with screw-top closures.

A8.16.2.3. Steel drums (1A1 or 1A2). 1A1 drums must not exceed 250 L (66 gallons), and 1A2 drums must not exceed 114 L (30 gallon) capacity each.

A8.16.3. White Phosphorus Igniters. Pack white phosphorus igniters one each in a hermetically-sealed (soldered) or watertight metal can, sealed airtight and positively fastened. Pack no more than 25 metal cans in a wooden box (4C1, 4C2, 4D, or 4F).

A8.17. Smokeless Powder for Small Arms (100 pounds or less) must be packaged as follows. The PSN "SMOKELESS POWDER FOR SMALL ARMS" is only valid for domestic movement. For international shipment you must use the PSN "POWDER, SMOKELESS" and package the material as required by the packaging paragraph for powder, smokeless. The complete package must be a type examined by the Bureau of Explosives, approved by the DOT, and meet **A3.3.1.** Not more than 45.4 kg (100 pounds) is allowed on the aircraft. Only combination packaging with inner packagings not exceeding 3.6 kg (8 pounds) net mass are authorized. Arrange and protect inner packagings to prevent simultaneous ignition of the contents.

A8.18. Batteries and Cells Containing Sodium must be packaged as follows. Ensure batteries and cells do not contain any hazardous material other than sodium, sulfur, or polysulfides. Do not offer batteries or cells for transportation at a temperature at which there is any liquid elemental sodium present in the battery or cell. Ensure the external battery temperature does not exceed 55 degrees C (130 degrees F). Ensure batteries are protected from external short circuit.

A8.18.1. Batteries must consist of cells secured within and fully enclosed by a metal casing. Ship unpackaged or in nonspecification protective packagings. UN specification containers are not required.

A8.18.2. Cells must consist of hermetically sealed metal casings that completely enclose the hazardous material. Pack cells with sufficient cushioning material to secure against movement; and to prevent contact between cells and between cells and the internal surfaces of the outer packaging. Pack cells in packaging that meets the PG II performance level.

A8.18.2.1. Package in drums as follows:

Inner packaging	Outer packaging
Not Required	Drums: steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), or plastic (1H2)

A8.18.2.2. Package in boxes as follows:

Inner packaging	Outer packaging
Not Required	Boxes: ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), or plastic (4H2)

Attachment 9

CLASS 5--OXIDIZING MATERIALS AND ORGANIC PEROXIDES

A9.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 5.1 (oxidizing material) and Class 5.2 (organic peroxides). See **Attachment 3** for other details concerning Class 5 material.

A9.2. Organic Peroxides Table. Table A9.1., Organic Peroxides Table, specifies, by technical name, the organic peroxides authorized for transportation. An organic peroxide identified by technical name in **Table A9.1.** must comply with all of the applicable provisions of the table. An organic peroxide not identified in **Table A9.1.** by technical name or a new formulation of identified organic peroxides requires written approval from the DOT according to 49 CFR 173.128 before transportation. A description of the column headings of **Table A9.1.** is as follows:

A9.2.1. Technical Name. Column 1 specifies the technical name. Use the technical name to determine the applicable UN identification number in column 2.

A9.2.2. Identification Number. Column 2 specifies the UN identification number for a corresponding technical name. Use the identification number to identify the PSN in **Table A4.1.** The word "EXEMPT" appearing in the column denotes that the material is not regulated as an organic peroxide.

A9.2.3. Concentration of Organic Peroxide. Column 3 specifies the concentration (mass percent of organic peroxide) limitations, if any, in mixtures or solutions. The number listed identifies the amount of organic peroxide (by mass) that is authorized for a mixture or solution containing the organic peroxide listed in column A9.2.3.1. Limitations are given as minimums, maximums, or a range, as appropriate. A range includes the lower and upper limits (i.e., 53-100 means from and including 53 percent to and including 100 percent). It is the responsibility of the party producing the material for shipment (contractor or manufacturer) to develop the material within the safe concentration range specified in the table.

A9.2.4. Concentration of Diluents. Column 4 specifies the concentration (mass percent) of diluent type A; diluent type B in column 5; and inert solid in column 6; that must be mixed with the organic peroxide, when required. It is the responsibility of the party producing the material for shipment (contractor or manufacturer) to comply with the safe concentration requirements specified in columns 4-6.

A9.2.5. Concentration of Water. Column 7 specifies (in mass percent) the minimum amount of water required in the formulation. If the column is blank, there is no specified requirement for water content.

A9.2.6. Control and Emergency Temperatures. Column 8 specifies the control temperature and column 9 specifies the emergency temperature, when required. If a column is left blank, temperature controls are not required.

A9.2.7. Notes. Column 10 identifies additional requirements when applicable. The notes are provided at the end of the table.

Table A9.1. Organic Peroxides.

ORGANIC PEROXIDES	**See A9.2. for instructions on use of this table.**								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ACETYL ACETONE PEROXIDE	3105	≤42	≥48			≥8			1
ACETYL ACETONE PEROXIDE (as a paste)	3106	≤32							14
ACETYL CYCLOHEXANE-SULPHONYL PEROXIDE	3112	≤82			≥12		-10	0	
ACETYL CYCLOHEXANE-SULPHONYL PEROXIDE	3115	≤32		≥68			-10	0	
tert-AMYL HYDROPEROXIDE	3107	≤88	≥6			≥6			
tert-AMYL PEROXYACETATE	3105	≤62	≥38						
tert-AMYL PEROXYBENZOATE	3103	≤100							
tert-AMYL PEROXY-2-ETHYLHEXANOATE	3115	≤100					20	25	
tert-AMYL PEROXY-2-ETHYLHEXYL CARBONATE	3105	≤100							
tert-AMYL PEROXY ISOPROPYL CARBONATE	3103	≤77	≥23						
tert-AMYL PEROXYNEODECANOATE	3115	≤77		≥23			0	10	
tert-AMYL PEROXYPIVALATE	3113	≤77		≥23			10	15	
tert-AMYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	3101	≤100							
tert-BUTYL CUMYL PEROXIDE	3107	>42-100							

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
tert-BUTYL CUMYL PEROXIDE	3108	≤52			≥48				
n-BYTYL-4,4-DI-(tert-BUTYLPEROXY)-VALERAT E	3103	>52-100							
n-BUTY-4,4-DI-(tert-BUTYL – PEROXY)-VALERATE	3108	≤42			≥58				
tert-BUTYL HYDROPEROXIDE	3103	>79-90				≥10			8
tert-BUTYL HYDROPEROXIDE	3105	≤80	≥20						3,8
tert-BUTYL HYDROPEROXIDE	3107	≤79				>14			8,10
tert-BUTYL HYDROPEROXIDE	3109	≤72				≥28			8
tert-BUTYL HYDROPEROXIDE (and) Di-tert-BUTYL PEROXIDE	3103	<82+>9				≥7			8
tert-BUTYL MONOPEROXYMALEATE	3102	>52-100							
tert-BUTYL MONOPEROXYMALEATE	3103	≤52	≥48						
tert-BUTYL MONOPEROXYMALEATE	3108	≤52			≥48				
tert-BUTYL MONOPEROXYMALEATE (as a paste)	3108	≤52							
tert-BUTYL PEROXYACETATE	3101	>52-77	≥23						
tert-BUTYL PEROXYACETATE	3103	>32-52	≥48						
tert-BUTYL PEROXYACETATE	3109	≤32	≥68						
tert-BUTYL PEROXYBENZOATE	3103	>77-100							

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
tert-BUTYL PEROXYBENZOATE	3105	>52-77	≥23						1
tert-BUTYL PEROXYBENZOATE	3106	≤52			≤48				
tert-BUTYL PEROXYBUTYL FUMARATE	3105	≤52	≥48						
tert-BUTYL PEROXYCROTONATE	3105	≤77	≥23						
tert-BUTYL PEROXYDIETHYL-ACETATE	3113	≤100					20	25	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	3113	>52-100					20	25	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	3117	>32-52		≥48			30	35	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	3118	≤52			≥48		20	25	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	3119	≤32		≥68			40	45	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE and 2,2-DI-(TERT-BUTYLPEROXY) BUTANE	3106	≤12+≤14	≥14		≥60				
tert-BUTYL PEROXY-2-ETHYLHEXANOATE and 2,2-DI-(TERT-BUTYLPEROXY) BUTANE	3115	≤31+≤36		≥33			35	40	
tert-BUTYL PEROXY-2-ETHYLHXYLCARBONATE	3105	≤100							

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
tert-BUTYL PEROXYISOBUTYRATE	3111	>52-77		≥23			15	20	
tert-BUTYL PEROXY ISOPROPYLCARBONATE	3103	≤77	≥23						
1-(2-tert-BUTYLPEROXY ISOPROPYL)-3-ISOPROPENYLBENZE	3105	≤77	≥23						
1-(2-tert-BUTYLPEROXY ISOPROPYL)-3-ISOPROPENYLBENZE	3108	≤42			≥58				
tert-BUTYL PEROXY-2-METHYLBENZOATE	3103	≤100							
tert-BUTYL PEROXY-NEODECANOATE	3115	>77-100					-5	5	
tert-BUTYL PEROXY-NEODECANOATE	3115	≤77		≥23			0	10	
tert-BUTYL PEROXY-NEODECANOATE [as a stable dispersion in water]	3119	≤52					0	10	
tert-BUTYL PEROXY-NEODECANOATE [as a stable dispersion in water (frozen)]	3118	≤42					0	10	
tert-BUTYL PEROXY-NEODECANOATE (	3119	≤32	≥68				0	10	
tert-BUTYL PEROXY-NEOHEPTANOATE	3115	≤77	≥23				0	10	
tert- BUTYL PEROXYNEOHEPTANOATE (as a stable dispersion in water)	3117	≤42					0	10	
tert-BUTYL PEROXYPIVALATE	3113	>67-77	≥23				0	10	
tert-BUTYL PEROXYPIVALATE	3115	>27-67		≥33			0	10	

ORGANIC PEROXIDES	**See A9.2. for instructions on use of this table.**								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
tert-BUTYL PEROXYPIVALATE	3119	≤27		≥73			30	35	
tert-BUTYLPEROXY STARYLCARBONATE	3106	≤100							
tert-BUTYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	3105	>32-100							
tert-BUTYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	3109	≤32		≥68					
3-CHLOROPEROXYBENZOIC ACID	3102	>57-86				≥14			
3-CHLOROPEROXYBENZOIC ACID	3106	≤57			≥3	≥40			
3-CHLOROPEROXYBENZOIC ACID	3106	≤77			≥6	≥17			
CUMYL HYDROPEROXIDE	3107	>90-98	≤10						8
CUMYL HYDROPEROXIDE	3109	≤90	≥10						8,9
CUMYL PEROXYNEODECANOATE	3115	≤77		≥23			-10	0	
CUMYL PEROXYNEO-NEODECANOATE [as a stable dispersion in water]	3119	≤52					-15	0	
CUMYL PEROXYNEO-HEPTANOATE	3115	≤77	≥23				-10	0	
CUMYL PEROXYPIVALATE	3115	≤77		≥23			-5	5	
CYCLOHEXANONE PEROXIDE(S)	3104	≤91				≥9			8
CYCLOHEXANONE PEROXIDE(S)	3105	≤72	≥28						4
CYCLOHEXANONE PEROXIDE(S) as a paste	3106	≤72							4,14

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
DIBENZOYL PEROXIDE	3102	>51-100			≤48				2
DIBENZOYL PEROXIDE	3102	>77-94				≥6			2
DIBENZOYL PEROXIDE	3104	≤77				≥23			
DIBENZOYL PEROXIDE	3106	≤62			≥28	≥10			
DIBENZOYL PEROXIDE (as a paste)	3106	>52-62							14
DIBENZOYL PEROXIDE	3106	>35-52			≥48				
DIBENZOYL PEROXIDE	3107	>36-42	≥18			≤40			
DIBENZOYL PEROXIDE (as a paste)	3108	≤565				≥15			
DIBENZOYL PEROXIDE (as a paste)	3108	≤52							14
DIBENZOYL PEROXIDE [as a stable dispersion in water]	3109	≤42							
DIBENZOYL PEROXIDE	EXEMPT	≤35			≥65				
DI-(4-tert-BUTYLCYCLOHEXYL) PEROXYDICARBONATE	3114	≤100					30	35	
DI-(4-tert-BUTYLCYCLOHEXYL)PERO XYDICARBONATE as a stable dispersion in water	3119	≤42					30	35	
DI-tert-BUTYL PEROXIDE	3107	>52-100							
DI-tert-BUTYL PEROXIDE	3109	≤52		≥48					17
DI-tert-BUTYL PEROXYAZELATE	3105	≤52	≥48						
2,2-DI-(tert-BUTYLPEROXY) BUTANE	3103	≤52	≥48						
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3101	>80-100							
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3103	>52-80	≥20						

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emer-gency Temp (°C)**	**Note**
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3105	>42-52	≥48						
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3106	≤42	≥13		≥45				
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3107	≤27	≥25						15
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3109	≤42	≥58						
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3109	≤25	≥25	≥50					
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3109	≤13	≥13	≥74					
DI-N-BUTYL PEROXYDICARBONATE	3115	>27-52		≥48			-15	-5	
DI-N-BUTYL PEROXYDICARBONATE	3117	≤27		≥73			-10	0	
DI-N-BUTYL PEROXYDICARBONATE [as a stable dispersion in water (frozen)]	3118	≤42					-15	-5	
DI-SEC-BUTYLPEROXY DICARBONATE	3113	>52-100					-20	-10	
DI-SEC-BUTYL PEROXYDICARBONATE	3115	≤52		≥48			-15	-5	
DI-(2-tert-BUTYLPEROXYISO-PROPYL)-BENZENE(S)	3106	>42-100			≤57				
DI-(2-tert-BUTYLPEROXYISO-PROPYL)-BENZENE(S)	EXEMPT	≤42			≥58				
DI-(tert-BUTYLPEROXY) PHTHALATE	3105	>42-52	≥48						
DI-(tert-BUTYLPEROXY) PHTHALATE (as a paste)	3106	≤52							14
DI-(tert-BUTYLPEROXY) PHTHALATE	3107	≤42	≥58						

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
2,2-DI-(tert-BUTYLPEROXY)-PROPANE	3105	≤52	≥48						
2,2-DI-(tert-BUTYLPEROXY)-PROPANE	3106	≤42	≥13		≥45				
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	3101	>90-100							
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	3103	>57-90	≥10						
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	3103	≤77		≥23					
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	3110	<57			≥43				
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL – CYCLOHEXANE	3107	≤57	≥43						
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL – CYCLOHEXANE	3107	≤32	≥26	≥42					
DICETYL PEROXYDICARBONATE	3116	≤100					30	35	
DICETYL PEROXYDICARBONATE (as a stable dispersion in water)	3119	≤42					30	35	
DI-4-CHLOROBENZOYL PEROXIDE	3102	≤77				≥23			
DI-4-CHLOROBENZOYL PEROXIDE as a paste	3106	≤52							14
DI-4-CHLOROBENZOYL PEROXIDE	EXEMPT	≤32			≥68				
DICUMYL PEROXIDE	3110	>52-100			≤48				

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
DICUMYL PEROXIDE	EXEMPT	≤52			≥48				
DICYCLOHEXYL PEROXYDICARBONATE	3112	>91-100					10	15	
DICYCLOHEXYL PEROXYDICARBONATE	3114	≤91				≥9	10	15	
DICYCLOHEXYL PEROXYDICARBONATE (as a stable dispersion in water)	3119	≤42					15	20	
DIDECANOYL PEROXIDE	3114	≤100					30	35	
2,2-DI-(4,4-DI(TERT-BUTYLPEROXYCYCLO-HEXYL) PROPANE	3106	≤42			≥58				
2,2-DI-(4,4-DI(TERT-BUTYLPEROXYCYCLO-HEXYL) PROPANE	3107	≤22		≥78					
DI-2,4-DICHLOROBENZOYL PEROXIDE (as a paste with silicon oil)	3106	≤52							
DI-(2-ETHOXYETHYL) PEROXYDICARBONATE	3115	≤52		≥48			-10	0	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE	3113	>77-100					-20	-10	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE	3115	≤77		≥23			-15	-5	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE as a stable dispersion in water	3117	≤62					-15	-5	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE as a stable dispersion in water	3119	≤52					-15	-5	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE as a stable dispersion in water (frozen)	3120	≤52					-15	-5	

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE as a stable dispersion in water	3119	≤52					-15	-5	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE as a stable dispersion in water (frozen)	3120	≤52					-15	-5	
2,2-DIHYDRO-PEROXYPROPANE	3102	≤27			≥73				
DI-(1-HYDRO-XYCYCLOHEXYL) PEROXIDE	3106	≤100							
DIISOBUTYRYL PEROXIDE	3111	>32-52		≥48			-20	-10	
DIISOBUTYRYL PEROXIDE	3115	≤32		≥68			-20	-10	
DI-ISOPROPYLBENZENE DIHYDROPEROXIDE	3106	≤82	≥5			≥5			11
DIISOPROPYL PEROXYDICARBONATE	3112	>52-100					-15	-5	
DIISOPROPYL PEROXYDICARBONATE	3115	≤52		≥48			-20	-10	
DIISOPROPYL PEROXYDICARBONATE	3115	<28	≥72				-15	-5	
DILAUROYL PEROXIDE	3106	≤100							
DILAUROYL PEROXIDE (as a stable dispersion in water)	3109	≤42							
DI-(3-METHOXUYBUTYL)PERO-XYDICARBONATE	3115	≤52		≥48			-5	5	
DI-(2-METHYLBENZOYL) PEROXIDE	3112	≤87				≥13	30	35	
DI-(4-METHYLBENZOYL) PEROXIDE (as a paste with silicone oil)	3106	≤52							

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
DI-(3-METHYLBENZOYL) PEROXIDE + BENZOYL (3-METHYLBENZOYL) PEROXIDE+DIBENZOYL PEROXIDE	3115	≤20+≤ 18+≤4		≥58			30	40	
2,5-DIMETHYL-2,5-DI-(BENZ OYLPEROXY) HEXANE	3102	>82-10 0							
2,5-DIMETHYL-2,5-DI-(BENZ OYLPEROXY) HEXANE	3106	≤82			≥18				
2,5-DIMETHYL-2,5-DI-(BENZ OYLPEROXY) HEXANE	3104	≤82				≥18			
2,5-DIMETHYL-2,5-DI-(tert-B UTYL-PEROXY) HEXANE	3105	>52-10 0							
2,5-DIMETHYL-2,5-DI-(tert-B UTYL-PEROXY) HEXANE	3108	≤77			≥23				
2,5-DIMETHYL-2,5-DI-(tert-B UTYL-PEROXY) HEXANE	3109	≤52	≥48						
2,5-DIMETHYL-2,5-DI-(tert-B UTYL-PEROXY) HEXANE (as a paste)	3108	≤47							
2,5-DIMETHYL-2,5-DI-(tert-B UTYL-PEROXY) HEXYNE-3	3101	>86-10 0							
2,5-DIMETHYL-2,5-DI-(tert-B UTYL-PEROXY) HEXYNE-3	3103	>52-86	≥14						
2,5-DIMETHYL-2,5-DI-(tert-B UTYL- PEROXY) HEXYNE-3	3106	≤52			≥48				
2,5-DIMETHYL-2,5-DI-(2-ETH YLHEXANOYLPEROXY)HEX ANE	3113	<100					20	25	
2,5-DIMETHYL-2,5-DIHYDRO PEROXYHEXANE	3104	≤82				≥18			
2,5-DIMETHYL-2,5-DI-(3,5,5-T RIMETHYLHEXANOYL-PER OXY) HEXANE	3105	≤77	≥23						

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
1,1-DIMETHYL-3-HYDROXY BUTYLPEROXY-NEOHEPTANOATE	3117	≤52	≥48				0	10	
DIMYRISTYL PEROXYDICARBONATE	3116	≤100					20	25	
DIMYRISTYL PEROXYDICARBONATE (as a stable dispersion in water)	3119	≤42					20	25	
DI-(2-NEODECANOYL PEROXYISO-PROPYL BENZENE	3115	≤52	≥48				-10	0	
DI-N-NONANOYL PEROXIDE	3116	≤100					0	10	
DI-N-OCTANOYL PEROXIDE	3114	≤100					10	15	
DI-(2-PHENOXYETHYL) PEROXYDICARBONATE	3102	>85-100							
DIPROPIONYL PEROXIDE	3117	≤27		≥73			15	20	
DI-N-PROPYL PEROXYDICARBONATE	3113	≤100					-25	-15	
DI-N-PROPYL PEROXYDICARBONATE	3113	≤77		≥23			-20	-10	
DISUCCINIC ACID PEROXIDE	3102	>72-100							12
DISUCCINIC ACID PEROXIDE	3116	≤72				≥28	10	15	
DI-(3,5,5-TRIMETHYL-HEXANOYL) PEROXIDE	3115	>38-82	≥18				0	10	
DI-(3,5,5-TRIMETHYLHEXANOYL)PEROXIDE(as a stable dispersion in water)	3119	≤52					10	15	
DI-(3,5,5-TRIMETHYL-HEXANOYL) PEROXIDE	3119	≤38	≥62				20	25	
ETHYL-3,3-DI-(tert-AMYLPEROXY) BUTYRATE	3105	≤67	≥33						

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
ETHYL-3,3-DI-(tert-BUTYLPEROXY) BUTYRATE	3103	>77-100							
ETHYL-3,3-DI-(tert-BUTYLPEROXY) BUTYRATE	3105	≤77	≥23						
ETHYL-3,3-DI-(tert-BUTYLPEROXY) BUTYRATE	3106	≤52			≥48				
1-(2-ETHYLHEXANOYLPERXO-XY)-1,3-DIMETHYLBUTYL PEROXYPIVALATE	3115	≤52	≥45	≥10			-20	-10	
tert-HEXYL PEROXYNEODECANOATE	3115	≤71	≥29				0	10	
tert-HEXYL PEROXYPIVALATE	3115	≤72		≥28			10	15	
ISOPROPYL SEC-BUTYL PEROXYDICARBONATE+ DISEC-BUTYL PEROXYDICARBONATE+ DI-ISOPROPYL PEROXYDICARBONATE	3111	≤52 + ≤28+≤ 22					-20	-10	
ISOPROPYL SEX-BUTYL PEROXYDICARBONATE+DI-SEC-BUTYL PEROXYDICARBONATE+DI-ISOPRPYL PEROXYDICARBONATE	3115	≤32+≤ 15-18+ ≤12-15					-20	-10	
ISOPROPYLCUMYL HYDROPEROXIDE	3109	≤72	≥28						8
p-MENTHYL HYDROPEROXIDE	3105	>72-100							8
p-MENTHYL HYDROPEROXIDE	3109	≤72	≥28						
METHYLCYCLOHEXANONE PEROXIDE(S)	3115	≤67		≥33			35	40	

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
METHYLCYCLOHEXANONE PEROXIDE(S)	3115	≤67		≥33			35	40	
METHYL ETHYL KETONE PEROXIDE(S)	3101	≤52	≥48		-				4,8
METHYL ETHYL KETONE PEROXIDE(S)	3105	≤45	≥55						4
METHYL ETHYL KETONE PEROXIDE(S)	3107	≤40	≥60						4
METHYL ISOBUTYL KETONE PEROXIDE(S)	3105	≤62	≥19						4,16
ORGANIC PEROXIDE, LIQUID, SAMPLE	3103								7
ORGANIC PEROXIDE, LIQUID,SAMPLE, TEMPERATURE CONTROLLED	3113								7
ORGANIC PEROXIDE, SOLID, SAMPLE	3104								7
ORGANIC PEROXIDE, SOLID, SAMPLE, TEMPERATURE CONTROLLED	3114								7
PEROXYACETIC ACID, TYPE D, STABILIZED	3105	≤43							8,13
PEROXYACETIC ACID, TYPE E, STABILIZED	3107	≤43							8,13
PEROXYACETIC ACID, TYPE F, STABILIZED	3109	≤43							8,13, 21
PEROXYACETIC ACID with not more than 7% hydrogen peroxide	3107	≤36				≥15			8,13, 21
PEROXYACETIC ACID ORPERACETIC ACID (with not more than 20% hydrogen peroxide)	EXEMPT	≤6				≥60			21

ORGANIC PEROXIDES	See A9.2. for instructions on use of this table.								
Technical Name	**UN#**	**Con-centra- tion**	**Dilu-ent Mass % A**	**Dilu-ent Mass % B**	**Dilu-ent Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emer-gency Temp (ºC)**	**Note**
PEROXYACETIC ACID with not more than 26% hydrogen peroxide	3109	≤17							8,13, 21
PEROXYLAURIC ACID	3118	≤100					35	40	
PINANYL HYDROPEROXIDE	3105	56 - 100							8
PINANYL HYDROPEROXIDE	3109	≤56	≥44						
POLYETHER POLY-tert-BUTYLPEROXYCARBONA-TE	3107	≤52		≥23					
TETRAHYDRONAPHTHYL HYDROPEROXIDE	3106	≤100							
1,1,3,3-TETRAMETHYLBUTYL HYDROPEROXIDE	3105	≤100							
1,1,3,3-TETRAMETHYLBUTYL PEROXY-2-ETHYLHEXANOATE	3115	≤100					15	20	
1,1,3,3-TETRAMETHYLBUTYL PEROXYNEODECANOATE	3115	≤72		≥28			-5	5	
1,1,3,3-TETRAMETHYLBUTYL PEROXYNEODECANOATE [as a stable dispersion in water]	3119	≤52					-5	5	
1,1,3,3-TETRAMETHYLBUTYL PEROXYPIVALATE	3115	≤77		≥23			0	10	
3,6,9-TRIETHYL-3,6,9-TRIMETHYL-1,4,7-TRIPEROXANANE	3105	≤42	≥58						19

NOTES:

1. Available oxygen must be less than 4.7 percent.
2. For concentration of less than 80 percent, Item 5 is authorized. For concentration of at least 80 percent but less than 85 percent, Item 4 is authorized. For concentration of greater than 85 percent, maximum package quantity is Item 2.

3. The diluent may be replaced by ditert-butyl peroxide.
4. Available oxygen must be less than or equal to 9 percent with or without water.
5. Available oxygen must be less than or equal to 8.2 percent with or without water.
6. Only non-metallic packagings are authorized.
7. Samples may only be offered for transportation when all available data indicates that the sample is no more dangerous than an Organic Peroxide type C, and the sample is packaged in according with **Table A9.2.** or **Table A9.2.**, Item 2, in quantities less than (10 kg) 22 pounds per shipment, employing all required temperature controls.
8. "Corrosive" subsidiary risk label is required.
9. No "Corrosive" subsidiary risk label is required for concentration less than 80 percent.
10. With less than 6 percent DI-tert-BUTYL PEROXIDE.
11. With greater than or equal to 8 percent 1- ISOPRPYLHYDROXYBENZENE.
12. Addition of water to this organic peroxide will decrease its thermal stability.
13. Mixtures with hydrogen peroxide, water and acid.
14. With Diluent type A, with or without water.
15. With greater than 36 percent (by mass), and in addition ethylbenzene.
16. With greater than 19 percent (by mass), and in addition methyl isobutyl ketone.
17. Diluent type B with boiling point greater than 100 C.
18. No "Corrosive" subsidiary risk label is required for concentration below 56 percent.
19. Available oxygen must be less than or equal to 7.6 percent.
20. Formulations derived from distillation of peroxyacetic acid originating from peroxyacetic acid in a concentration of not more than 41 percent with water, total active oxygen less than or equal to 9.5 percent (peroxyacetic acid plus hydrogen peroxide).
21. For the purpose of this section, the names "Peroxyacetic Acid" & "Peracetic Acid" are synonymous.

A9.3. Class 5.2 Organic Peroxides must be packaged as follows. With the exception of organic peroxide samples, packaging requirements for packaging paragraphs does not specify Class 5.2 organic peroxides. Determine appropriate containers by using **Table A4.1.** generic proper shipping names in conjunction with **Table A9.2.** or **Table A9.3.** Containers selected from **Table A9.2.** or **Table A9.3.** must pass PG II performance tests and must be UN marked. **Table A9.2.** applies to liquid organic peroxides. **Table A9.3.** applies to solid organic peroxides. Use paragraphs **A9.3.1.** through **A9.3.6.** to determine the packaging requirements for organic peroxides.

A9.3.1. Determine the applicable generic PSN.

A9.3.2. Locate the packaging reference (table and item number) for the generic PSN in column 8 of **Table A4.1.** The technical name and associated table or item reference will be listed in lower case letters beneath the generic PSN entry. Select the table or item reference pertaining to the technical name,

but use the generic PSN (with technical name in parenthesis) to certify the shipment. The item number is the last number in the packaging reference (i.e., **Table A9.2.**1 is **Table A9.2.**, Item 1). Labels, special provisions, etc., specified for the generic PSN also apply to the technical names listed beneath it.

A9.3.3. Turn to **Table A9.2.** or **Table A9.3.** as specified by column 8 of **Table A4.1.**

A9.3.4. Locate the quantity nearest to the quantity to be shipped. This number represents the maximum net quantity per package authorized. Lesser item numbers (quantities) may be used instead of the item number specified for the material. Quantities specified for greater item numbers will not be used. For example, if the packaging reference is **Table A9.3.**4, item number 4 of **Table A9.3.** represents the maximum net quantity of the material that can be shipped in one package. However, the lesser quantities listed for item numbers 1-3 could also be used; quantities listed for item numbers 5-8 could not be used for the material because the quantities exceed the maximum net quantity per package permitted for the material.

A9.3.5. Go across the row that contains the quantity to be shipped to identify the appropriate container (including applicable notes). Any container fitting the general container description in the table may be used if it has been tested to a PG II (or PG I) performance level.

A9.3.6. Column 8 of **Table A4.1.** specifies the packaging requirements (table and item number) for organic peroxides. **Table A9.2.** specifies the type of packagings and the maximum net quantity per package authorized for liquid organic peroxides. **Table A9.3.** specifies the type of packaging and the maximum net quantity per package authorized for solid organic peroxides.

Table A9.2. Packaging For Liquid Organic Peroxides.

PACKAGING FOR LIQUID ORGANIC PEROXIDES (See A9.3. for instructions on use of this table.)									
Maximum Quantity or Net Mass Permitted per Container									
TYPE CONTAINERS AND MATERIALS	**PKG CODE**	**A9.2.1**	**A9.2.2**	**A9.2.3**	**A9.2.4**	**A9.2.5**	**A9.2.6**	**A9.2.7**	**A9.2.8**
STEEL DRUM	1A1							60L	225L
STEEL DRUM (1)	1A2							50Kg	200Kg
ALUMINUM DRUM	1B1							60L	225L
FIBER DRUM	1G	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	200Kg
PLASTIC DRUM	1H1	0.5L	0.5L	5L	5L	30L	60L	60L	255L
PLASTIC JERRICAN	3H1	0.5L	0.5L	5L	5L	30L	60L	60L	60L
WOOD BOX (1)	4C1	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	100Kg
PLYWOOD BOX (1)	4D	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	100Kg
FIBERBOARD BOX (1)	4G	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	100Kg
PLASTIC RECEPTACLE WITH OUTER STEEL DRUM	6HA1							60L	225L
PLASTIC RECEPTACLE WITH OUTER ALUMINUM DRUM	6HB1							60L	225L
PLASTIC RECEPTACLE WITH OUTER FIBER DRUM	6HG1	0.5L	0.5L	5L	5L	30L	60L	60L	225L
PLASTIC RECEPTACLE WITH OUTER FIBERBOARD BOX	6HG2	0.5L	0.5L	5L	5L	30L	60L	60L	60L
PLASTIC RECEPTACLE WITH OUTER PLASTIC DRUM	6HH1	0.5L	0.5L	5L	5L	30L	60L	60L	225L
PLASTIC RECEPTACLE WITH OUTER SOLID PLASTIC BOX	6HH2	0.5L	0.5L	5L	5L	30L	60L	60L	60L

NOTES:

1. Packaging only authorized as part of a combination packaging. Inner receptacles must be suitable for liquids.
2. For Items 1 through 6, combination packagings containing organic peroxide type B or C, only plastic bottles, plastic jars, glass bottles, or glass ampoules may be used as inner packagings. However, glass may only be used for inner receptacles for Items 1 and 2.
3. Where two values are given (i.e. .5/10 kg), the first applies to the maximum net quantity per inner receptacle and the second applies to the maximum net quantity of the complete package.
4. If no entry for an item number appears in a specific row, then the type of packaging specified for the row is not authorized for the item number.

Table A9.3. Packaging For Solid Organic Peroxides.

PACKAGING FOR SOLID ORGANIC PEROXIDES (See A9.3. for instructions on use of this table.)									
Maximum Quantity or Net Mass Permitted per Container									
TYPE CONTAINERS AND MATERIALS	**PKG CODE**	**A.9.3.1**	**A.9.3.2**	**A9.3.3**	**A.9.3.4**	**A9.3.5**	**A9.3.6**	**A9.3.7**	**A9.3.8**
STEEL DRUM	1A2							50Kg	200Kg
ALUMINUM DRUM	1B2							50Kg	200Kg
FIBER DRUM	1G	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	200Kg
PLASTIC DRUM	1H2	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	200Kg
WOOD BOX	4C1	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	100Kg
PLYWOOD BOX	4D	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	100Kg
FIBERBOARD BOX	4G	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	100Kg
PLASTIC RECEPTACLE WITH OUTER STEEL DRUM	6HA1							50Kg	200Kg
PLASTIC RECEPTACLE WITH OUTER ALUMINUM DRUM	6HB1							50Kg	200Kg
PLASTIC RECEPTACLE WITH OUTER FIBER DRUM	6HG1	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	200Kg
PLASTIC RECEPTACLE WITH OUTER FIBERBOARD BOX	6HG2	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	75Kg
PLASTIC RECEPTACLE WITH OUTER PLASTIC DRUM	6HH1	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	200Kg

PACKAGING FOR SOLID ORGANIC PEROXIDES (See A9.3. for instructions on use of this table.)									
Maximum Quantity or Net Mass Permitted per Container									
TYPE CONTAINERS AND MATERIALS	**PKG CODE**	**A.9.3.1**	**A.9.3.2**	**A9.3.3**	**A.9.3.4**	**A9.3.5**	**A9.3.6**	**A9.3.7**	**A9.3.8**
PLASTIC RECEPTACLE WITH OUTER SOLID PLASTIC BOX	6HH2	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	75Kg

NOTES:

1. For Items 1 through 6, combination packagings containing organic peroxide type B or C, only nonmetallic packagings are authorized. However, glass may only be used for inner receptacles for Items 1 and 2.
2. Where two values are given (i.e. .5/10 kg) the first applies to the maximum net quantity per inner receptacle and the second applies to the maximum net quantity of the complete package.
3. If no entry for an item number appears in a specific row, then the type of packaging in that row is not authorized for that item number.
4. If fire retardant partitions are used, the maximum net weight of the complete package for Item 2 may be 25 kg.

A9.4. Samples of Organic Peroxides must be packaged as follows. Samples of new organic peroxides or new formulations of identified organic peroxides for which complete test data is not available, and which are being transported for testing and evaluation, may be transported and assigned a PSN for organic peroxide, type C. Data available to the person offering the material for transportation must indicate that the sample would pose a threat no greater than that of an organic peroxide, type B, and that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation. Packaging requirements are as follows:

A9.4.1. The sample must be packaged according to **Table A9.2.** or **Table A9.3.**

A9.4.2. The maximum quantity must not exceed 10 kg (22 pounds) per shipment.

A9.4.3. The PSN must be organic peroxide type C, liquid; organic peroxide type C, solid; organic peroxide type C, liquid, temperature controlled; or organic peroxide type C, solid, temperature controlled, as applicable.

A9.5. Class 5.1 Liquids must be packaged as follows. See also **A3.3.5.**

A9.5.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal drum other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G) or plastic drum (1H1 or 1H2)

A9.5.2. Package in barrels as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	Barrel: wood (2C2) ***NOTE:*** _ Not authorized for PG I material.

A9.5.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2

A9.5.4. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	Boxes: steel (4A), aluminum (4B), natural (4C1 or 4C2), plywood (4D), or reconstituted (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A9.5.5. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), or plastic drum (1H1 or 1H2)

A9.5.6. Package in barrels as follows:

Inner packaging	Outer packaging
Not required	Barrel: wood (2C1) ***NOTE:*** Not authorized for PG I material.

A9.5.7. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2

A9.5.8. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, fiber, plastic, or plywood (6HA1, 6HB1, 6HG1, 6HH, or 6HD1) ***NOTE:*** _ Plywood drum not authorized for PG I material.

A9.5.9. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Box: steel, aluminum, wooden, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A9.5.10. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1)

A9.5.11. Package the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)

A9.5.12. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	solid or expanded plastic packaging (6PH1 or 6PH2)

A9.5.13. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A9.6. Class 5.1 Solids must be packaged as follows. See **A3.3.5.** for additional packaging requirements.

A9.6.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G) or plastic (1H1 or 1H2)

A9.6.2. Package in barrels as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	Barrel: wood (2C2)

A9.6.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2

A9.6.4. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	Boxes: steel (4A), aluminum (4B), natural (4C1 or 4C2), plywood (4D), or reconstituted (4F), fiberboard (4G), or solid plastic (4H2)

A9.6.5. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), metal other than steel or aluminum (1N1 or 1N2), plastic (1H1 or 1H2) or fiber (1G) ***NOTE:*** _ Plywood drum not authorized for PG I material.

A9.6.6. Package in barrels as follows:

Inner packaging	Outer packaging
Not required	Barrel: wood (2C1 or 2C2). ***NOTE:*** _ Not authorized for PG I material.

A9.6.7. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerrican: steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A9.6.8. Package in boxes as follows:

Inner packaging	Outer packaging
Not required	Boxes: steel (4A), steel with liner (4A), aluminum (4B), aluminum with liner (4B), natural wood (4C1), natural wood, siftproof (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) ***NOTE:*** _ Steel (4A), aluminum (4B), plywood (4D), reconstituted wood (4F), natural wood (4C1) or fiberboard (4G) not authorized for PG I material.

A9.6.9. Package in bags as follows:

Inner packaging	Outer packaging
Not required	Bags: woven plastic (5H1, 5H2, or 5H3); plastic film (5H4); textile (5L1, 5L2, or 5L3); paper, multiwall, water-resistant (5M2) ***NOTE:*** _ Not authorized for PG I material.

A9.6.10. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH)

A9.6.11. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Boxes: steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A9.6.12. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, plywood, or fiber (6PA1, 6PB1, 6PD1, or 6PG1)

A9.6.13. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)

A9.6.14. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	expanded or solid plastic (6PH1 or 6PH2)

A9.7. Iodine Pentafluoride must be packaged as follows. Package in any DOT specification cylinder, except those specified for acetylene.

A9.8. Oxidizing Substances, Solid, Self-Heating, NOS; Oxidizing Substances, Solid, Flammable, NOS; Oxidizing Substances, Solid, Water Reactive, NOS must be packaged as follows. Ship according to a competent authority approval (CAA). See paragraph **2.5.** for more information on CAAs.

A9.9. Bromine Pentafluoride or Bromine Trifluoride must be packaged as follows:

A9.9.1. Handling Instructions. These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material.

A9.9.2. Packaging Requirements. Package bromine pentafluoride or bromine trifluoride in specification cylinders, 3A150, 3AA150, 3B240, 3BN150, 3E1800, 4B240, 4BA240, or 4BW240. Seal each valve outlet by a threaded cap or a threaded plug. No cylinder may be equipped with any pressure relief device. Overpack specification 3E1800 cylinders in a strong wooden box.

A9.10. Oxygen Generators, Chemical must be packaged as follows. Ship according to a competent authority approval (CAA) when means of initiation is attached. See paragraph **2.5.** for more information on CAAs. Ship according to **A9.6.** when means of initiation is not attached.

Attachment 10

CLASS 6-- TOXIC (POISONOUS) MATERIALS AND INFECTIOUS SUBSTANCES

A10.1. General Requirements. This attachment contains information concerning the packaging of Class 6.1 toxic material. The term "toxic" and "poisonous" are used synonymously in this manual. See **Attachment 3** for other details concerning Class 6 material.

A10.2. Packing Group I Class 6.1 Toxic Materials must be packaged as follows.

A10.2.1. Handling Instructions. These items may produce extremely toxic vapors. Approved chemical safety mask and clothing must be available when handling this material. See paragraph **2.8.** for additional requirements.

A10.2.2. Packaging Requirements. Package in DOT specification 3A1800, 3AA1800, 3AL1800, 3D, 3E1800, and 33 cylinders meeting the requirements of **A3.3.2.** Specification 3A, 3AA, and 3AL cylinders may not exceed 57 kg (125 pounds) water capacity (nominal). Specification 3D and 33 cylinders may not exceed 127 kg (280 pounds) water capacity (nominal). Shipments of arsine or phosphine will not be accepted for transportation if packaged in a specification 3AL cylinder. Cylinders containing phosgene may not exceed a filling density of 125 percent. The cylinder may not contain more than 68 kg (150 pounds) of phosgene. Also, each filled cylinder must be tested for leakage before it is offered for transportation and must show absolutely no leakage. This test must consist of immersing the cylinder and valve, without the protection cap attached, in a bath of water at a temperature of approximately 66 degrees C (150 degrees F) for at least 30 minutes. During which time, frequent examinations must be made to identify any escape of gas. After the test has been accomplished the valve of the cylinder must not be loosened before the cylinder is offered for transportation, and must not be loosened during transportation.

A10.3. Bromoacetone, Methyl Bromide, Chloropicrin, and Methyl Bromide or Methyl Chloride Mixtures must be packaged as follows.

A10.3.1. Handling Instructions. These materials and mixtures are extremely dangerous poisons. Approved chemical safety mask and clothing must be available when handling this material. See paragraph **2.8.** for additional information.

A10.3.2. Packaging Requirements.

A10.3.2.1. Package bromoacetone in a wooden box (4C1, 4C2, 4D, or 4F) with an inner glass receptacle or tube in an hermetically-sealed metal receptacle in a corrugated fiberboard carton. A bottle may not contain over 500 g (17.6 ounces) of liquid and must be cushioned inside the can with at least 12.7 mm (0.5 inch) of absorbent material. The total amount of liquid in the outer box must not exceed 11 kg (24 pounds). The package must be tested to the PG I performance level.

A10.3.2.2. Package bromoacetone in DOT specification 3A, 3AA, 3B, 3C, 3E, 4A, 4B, 4BA, 4BW, or 4C cylinder with a water capacity (nominal) not exceeding 113 kg (250 pounds). All cylinders must meet the requirements of **A3.3.2.**

A10.3.2.3. Package methyl bromide, chloropicrin and methyl bromide mixtures, chloropicrin and methyl chloride mixtures, and chloropicrin mixtures charged with nonflammable, nonliquefied compressed gas in DOT specification 3A, 3AA, 3B, 3C, 3E, 4A, 4B, 4BA, 4BW, or 4C cylinder

with a water capacity (nominal) not exceeding 113 kg (250 pounds). All cylinders must meet the requirements of **A3.3.2.**

A10.4. Packaging for Liquid Class 6.1 Materials must be packaged as follows.

A10.4.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, metal, or glass ampoules	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G), or plastic (1H1 or 1H2)

A10.4.2. Package in barrels as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, metal, or glass ampoules	Barrel: wood (2C2) ***NOTE:*** Not authorized for PG I material.

A10.4.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, metal, or glass ampoules	Jerricans: steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A10.4.4. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, metal, or glass ampoules	Boxes: steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A10.4.5. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plastic (1H1 or 1H2), or fiber (1G) with liner ***NOTE:*** Fiber drum with liner only authorized for PG III material.

A10.4.6. Package in barrels as follows:

Inner packaging	Outer packaging
Not required	Barrel: wood (2C1). ***NOTE:*** Not authorized for PG I material.

A10.4.7. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerricans: steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2).

A10.4.8. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, fiber, or plastic (6HA1, 6HB1, 6HG1, or 6HH1)

A10.4.9. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Boxes: steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A10.4.10. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1)

A10.4.11. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)

A10.4.12. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	solid or expanded plastic packaging (6PH1 or 6PH2)

A10.4.13. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	plywood drum or wickerwork hamper (6PD1 or 6PD2)

A10.4.14. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drum: plywood (6HD1). ***NOTE:*** _ Not authorized for PG I material.

A10.4.15. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A10.5. Solid Class 6.1 Materials must be packaged as follows:

A10.5.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic or metal	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood drum (1D), fiber (1G), or plastic (1H1 or 1H2)

A10.5.2. Package in barrels as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic or metal	Barrel: wood (2C2)

A10.5.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic or metal	Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A10.5.4. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic or metal	Boxes: steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic (4H2)

A10.5.5. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), plastic (1H1 or 1H2), or fiber drum (1G) ***NOTE:*** _ Plywood (1D) not authorized for PG I material.

A10.5.6. Package in barrels as follows:

Inner packaging	Outer packaging
Not required	Barrel: wood (2C1 or 2C2). ***NOTE:*** Not authorized for PG I material.

A10.5.7. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A10.5.8. Package in boxes as follows:

Inner packaging	Outer packaging
Not required	Boxes: steel with liner (4A), aluminum with liner (4B), natural wood sift-proof (4C2) Boxes (not authorized for PG I material): steel (4A), aluminum (4B), plywood (4D), reconstituted wood (4F), natural wood (4C1), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A10.5.9. Package in bags as follows:

Inner packaging	Outer packaging
Not required	Bags: woven plastic (5H1, 5H2, or 5H3), plastic film (5H4), textile (5L1, 5L2, or 5L3), or paper, multiwall, water-resistant (5M2) ***NOTE:*** _ Not authorized for PG I material.

A10.5.10. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1)

A10.5.11. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Boxes: steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A10.5.12. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, plywood, or fiber drum (6PA1, 6PB1, 6PD1, or 6PG1).

A10.5.13. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Boxes: steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2)

A10.5.14. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	expanded or solid plastic packaging (6PH1 or 6PH2)

A10.6. Class 6.1, PG I, Hazard Zone A and B (Poisonous by Inhalation) must be packaged as follows:

A10.6.1. Handling Instructions. These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material.

A10.6.2. Packaging Requirements. Package Class 6.1, PG I materials with an Inhalation Hazard (Hazard Zone A and B) as follows:

A10.6.2.1. In DOT specification cylinders that conform to one of the specifications for cylinders in 49 CFR, part 178, subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of **A3.3.2.**

A10.6.2.2. In an inner drum (1A1, 1B1, 1N1, 1H1, or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum must not exceed 220 L (58 gallons). The outer drum (1A2 or 1H2) must withstand a hydrostatic test pressure of 100kPa (15 psi). Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet the following requirements:

A10.6.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).

A10.6.2.2.2. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A10.6.2.2.3. Have screw-type closures that meet all the following requirements:

A10.6.2.2.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A10.6.2.2.3.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A10.6.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A10.6.2.2.4. Meet the following minimum thickness requirements:

A10.6.2.2.4.1. 1A1 and 1N1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.3 mm (0.051 inches). 1B1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches).

A10.6.2.2.4.2. 1A1 and 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.7 mm (0.067 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches).

A10.6.2.3. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal, securely cushioned with a nonreactive absorbent material. The package must be packed within a leak-tight packaging of metal or plastic, then packed in a steel drum (1A2), aluminum drum (1B2), metal drum (other than steel or aluminum (1N2)), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2). The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure must have a closure that is held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A10.6.2.4. Pack in a metal drum (1A1, 1B1, or 1N1), or plastic drum (1H1), then placed in a metal drum (1A2 or 1H2), or a plastic receptacle with outer steel drum (6HA1). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, 1N1, or 1H1) must not exceed 220 L (58 gallons). The outer drum (1A2 or 1H2) must withstand a hydrostatic test pressure of 100kPa (15 psi). This package is only authorized for Class 6.1, PG I, Hazard Zone B material. Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet the following requirements:

A10.6.2.4.1. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A10.6.2.4.2. Have screw-type closures that are:

A10.6.2.4.2.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A10.6.2.4.2.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A10.6.2.4.2.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A10.6.2.4.3. Meet the following minimum thickness requirements:

A10.6.2.4.3.1. 1A1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 0.69 mm (0.027 inches). 1B1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 2.79 mm (0.110 inches). 1H1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.14 mm (0.045 inches). 6HA1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.70 mm (0.027 inches) for the outer steel drum.

A10.6.2.4.3.2. 1A1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.08 mm (0.043 inches). 1B1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches). 1H1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.125 inches). 6HA1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.96 mm (0.038 inches) for the outer steel drum.

A10.6.2.4.3.3. 1A1 or 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.35 mm (0.053 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches). 1H1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.124 inches). 6HA1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 1.08 mm (0.43 inches) for the outer steel drum.

A10.7. Tear Gas Candles must be packaged as follows. Any newly developed packaging must be approved by the DOT before initial transportation from the manufacturer. Package tear gas candles, tear gas grenades, and similar devices (with more than 2 percent tear gas substance by mass).

A10.7.1. Pack in a metal-strapped natural wood box (4C1 or 4C2), metal-strapped plywood box (4D), or metal-strapped reconstituted wood box (4F). Functioning elements not assembled in grenades or devices must be packed in a separate compartment within the box, packed in inner boxes, then placed inside the outer box, or packed in a separate outside wooden (4C1, 4C2, 4D, or 4F) box. Pack and cushion the elements so they cannot come into contact with each other or in contact with the walls of the box during transportation. No more than 50 items and 50 functioning elements can be packed in one outer container. The gross weight of the outer container must not exceed 35 kg (77 pounds). Tear

gas devices can be shipped completely assembled provided the functioning elements are packed so that they cannot accidentally function. Package items completely assembled as specified in this paragraph.

A10.7.2. Pack in steel drum (1A2.) Pack functioning elements in a separate inner packaging or separate compartment. Pack no more than 24 items and 24 functioning elements in one outer drum. The gross weight of the outer container must not exceed 35 kg (77 pounds).

A10.7.3. DOT 2P and 2Q. Pack in inner containers meeting the DOT 2P or 2Q specification (inside nonrefillable metal containers), then packaged in a fiberboard box (4G). Place each inside container into fiberboard tubes with metal ends or a fiberboard box with suitable padding. Pack no more than 30 inner packagings in one outer fiberboard box. The gross weight must not exceed 16 kg (35 pounds).

A10.8. Infectious Substances (Etiologic Agent) and Genetically Modified Microorganisms must be packaged as follows.

A10.8.1. Handling Instructions.

A10.8.1.1. Infectious Substance, Affecting Humans, UN2814. This material has the potential to cause disease in humans. Do not handle if package is leaking or damaged. Notify technical escorts or medical personnel.

A10.8.1.2. Infectious Substance, Affecting Animals, UN2900. This material has the potential to cause disease in animals. Do not handle if package is leaking or damaged. Notify technical escorts or medical personnel.

A10.8.2. The following requirements apply to all shipments of Category A and Category B (in cultures) infectious substances, and genetically modified microorganisms:

A10.8.2.1. Use inner packagings that consist of a watertight primary receptacle, then place in a watertight secondary packaging.

A10.8.2.2. Place absorbent material between the primary receptacle and the secondary packaging. If multiple primary receptacles are placed in a single secondary packaging they must be separated with enough absorbent material to make sure there is no contact between the primary receptacles. There must be sufficient absorbent material to absorb the entire contents of all primary receptacles.

A10.8.2.3. This inner packaging must then be placed in a rigid outer packaging.

A10.8.2.4. Each package for infectious substances must be capable of passing the tests specified in 49 CFR 178.609.

A10.8.2.5. Each package must be at least 100 mm (3.9 inches) in the smallest overall external dimensions.

A10.8.2.6. Each package of infectious substances must have an itemized list of the contents enclosed between the secondary packaging and the outer packaging.

A10.8.2.7. For packages containing material that is unknown but suspected of meeting the criteria for inclusion in Category A and assignment to UN2814 or UN2900, the words “Suspected Category A Infectious Substance” must be shown in parenthesis following the PSN on the itemized list of contents inside the outer package.

A10.8.2.8. Whatever the intended temperature of shipment, the primary receptacle and the secondary packaging used for infectious substances must be capable of withstanding without leakage an internal pressure (which produces a pressure differential) of not less then 95 kPa (14 psi). Also, the primary receptacle and the secondary packaging must be capable of withstanding temperatures of -40 degrees C to +55 degrees C (-40 degrees F to +131 degrees F).

A10.8.2.9. In addition to the requirements of this paragraph, the requirements of 42 CFR, Public Health, **Chapter 1**, parts 72 and 73 must be followed.

A10.8.3. In addition to the requirements identified above, package infectious substances as specified below. Exceptional cases, such as whole organs, may require special packaging. Guidance for packaging materiel that requires temperature control during shipment is contained in DLAI 4145.21/TB MED 284/NAVSUPINST 4610.31/AFJI 41-208, Preparation of Medical Materiel Requiring Freeze or Chill Environment for Shipment."

A10.8.3.1. Lyophilized substances. Primary receptacles must be flame-sealed glass ampoules or rubber stopped glass vials fitted with metal seals.

A10.8.3.2. Liquid or solid substances shipped at ambient temperatures or higher. Primary receptacles must be glass, metal, or plastic. Provide a positive means of ensuring a leak proof seal, such as a heat seal, skirted stopper, or metal crimp seal. If screw caps are used, they must be reinforced with adhesive tape.

A10.8.3.3. Liquid or solid substances shipped refrigerated or frozen (ice, prefrozen packs, or dry ice.) Place ice or dry ice outside the secondary packagings. Provide interior supports to secure the secondary packagings in their original position after the ice or dry ice has dissipated. If ice is used, the outer packaging must be leak proof. If dry ice is used, the outer packaging must permit the release of carbon dioxide gas.

A10.8.3.4. Liquid or solid substances shipped in liquid nitrogen. Primary receptacles must be plastic, capable of withstanding very low temperatures. The secondary packaging must also withstand very low temperatures and in most cases will need to be fitted over individual primary receptacles. All requirements for shipment of liquid nitrogen must also be met.

A10.8.4. Damaged Packages. Upon discovering damage to the package, which indicates damage to the primary container, the carrier must isolate the container and notify the Director, Center for Disease Control, 1600 Clifton Road NE, Atlanta GA 30333 (telephone number (404) 633-5313), and the shipper.

A10.9. Biological Substances, Category B, and Patient/Diagnostic Specimens must be packaged as follows:

A10.9.1. Except as listed below, Biological Substances, Category B (includes patient/diagnostic specimens containing or believed to contain Biological Substances, Category B) are exempted from all other requirements of this manual (to include Shipper's Declaration For Dangerous Goods) when offered for transportation or transported in accordance with this paragraph. A patient/diagnostic specimen not containing Biological Substances, Category B is not regulated by this manual. A patient/diagnostic specimen meeting the definition of a hazard class must be transported as required for that class. The following requirements apply to Biological Substances, Category B:

A10.9.1.1. Use packaging consisting of a primary receptacle, a secondary packaging, and a rigid outer packaging.

A10.9.1.2. The primary receptacles must be packed in secondary packaging in such a way that, under normal conditions of transport, it cannot break, be punctured, or leak the contents into the secondary packaging.

A10.9.1.3. Secondary packagings must be secured in outer rigid packagings with suitable cushioning material such that any leakage of the contents will not impair the protective properties of the cushioning material or the outer packaging.

A10.9.1.4. Completed package must be capable of successfully passing the drop test in 49 CFR 178.603 at a drop height of at least 1.2 meters (3.9 feet).

A10.9.1.5. The outer packaging must be clearly and durably marked with the words "BIOLOGICAL SUBSTANCE, CATEGORY B" in letters at least 6mm high and must be marked adjacent to "UN 3373" (see paragraph **A14.4.5.3.**).

A10.9.2. Liquid Biological Substances, Category B. Liquid Biological Substances, Category B must be packaged as follows:

A10.9.2.1. The primary receptacle must be leakproof with a volumetric capacity of not more than 1 L (33.8 ounces).

A10.9.2.2. Place absorbent material between the primary receptacle and secondary packaging. If several fragile primary receptacles are placed in a single secondary packaging, they must be individually wrapped or separated so as to prevent contact between them. The absorbent material must be of sufficient quantity to absorb the entire contents of the primary receptacles.

A10.9.2.3. The secondary packaging must be leakproof.

A10.9.2.4. The primary receptacle or the secondary packaging must be capable of withstanding without leakage an internal pressure producing a pressure differential of not less than 95 kPa (0.95 bar, 14 psi) in the range of -40 degrees C to 55 degrees C (-40 degrees F to 130 degrees F).

A10.9.2.5. The outer packaging must not exceed 4 L (1 gallon) capacity.

A10.9.3. Solid Biological Substances, Category B . Solid Biological Substances, Category B must be packaged as follows:

A10.9.3.1. The primary receptacle must be siftproof and must not exceed the outer packaging weight limit.

A10.9.3.2. The secondary packaging must be siftproof.

A10.9.3.3. If several fragile primary receptacles are placed in a single secondary packaging, they must be individually wrapped or separated so as to prevent contact between them.

A10.9.3.4. Except for packages containing body parts, organs, or whole bodies, the outer packaging must not exceed 4 kg (8.8 pounds). This quantity excludes ice, dry ice, or liquid nitrogen, when used to ship specimens cold.

A10.9.3.5. If there the possibility of residual liquid in the primary receptacle during transport, then a packaging suitable for liquids, including absorbent material, must be used.

A10.9.4. Refrigerated or Frozen Specimens. The following applies:

A10.9.4.1. Liquid or solid substances shipped refrigerated or frozen (ice, prefrozen packs, or dry ice.) Place ice or dry ice outside the secondary packagings. Provide interior supports to secure the secondary packagings in their original position after the ice or dry ice has dissipated. If ice is used, the outer packaging must be leak proof. If dry ice is used, the outer packaging must permit the release of carbon dioxide gas.

A10.9.4.2. Liquid or solid substances shipped in liquid nitrogen. Primary receptacles must be plastic, capable of withstanding very low temperatures. The secondary packaging must also withstand very low temperatures and in most cases will need to be fitted over individual primary receptacles. All requirements for shipment of liquid nitrogen must also be met.

A10.10. Regulated Medical Waste; Biomedical Waste, N.O.S.; Clinical Waste, Unspecified, N.O.S.; Medical Waste, N.O.S. must be packaged as follows. Use packagings that meet the PG II performance level. Additionally, ensure the packaging is:

A10.10.1. Rigid, leak resistant, and impervious to moisture.

A10.10.2. Of sufficient strength to prevent tearing or bursting under normal conditions of handling and use.

A10.10.3. Sealed to prevent leakage during transport.

A10.10.4. Puncture-resistant for sharps and sharps with residual fluids, break-resistant, and tightly lidded for fluids in quantities greater than 20 cubic centimeters.

A10.10.5. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: aluminum (1B2), plywood (1D), fiberboard (1G), plastic (1H2), or steel (1A2)

A10.10.6. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerricans: steel (3A2) or plastic (3H2)

A10.10.7. Package in boxes as follows:

Inner packaging	Outer packaging
Not required	Boxes: natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F) or fiberboard (4G)

Attachment 11

CLASS 7--RADIOACTIVE MATERIALS

A11.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 7 (Radioactive Material). See **Attachment 3** for other details concerning Class 7 material.

A11.2. Activity Limits for Type A and Type B Packages:

A11.2.1. A Type A package must not contain a quantity of radioactivity greater than A_1 (for special form radioactive material) or A_2 for all other radioactive materials as listed in **A11.4.** Activity limits not listed in **A11.4.** are determined per 49 CFR 173.431.

A11.2.2. The limits on activity contained in a Type B(U) or Type B(M) package are those prescribed in **A11.9.** and **A11.10.** or in the applicable approval certificate in accordance with 49 CFR 173.471, 173.472 or 173.473.

A11.3. Determining A1 and A2 Values for Radionuclides:

A11.3.1. For single radionuclides of known identity, the values of A_1 and A_2 are those given in **A11.4.** The values of A_1 and A_2 are also applicable for radionuclides contained in (a,n) or (h,n) neutron sources.

A11.3.2. For any single radionuclide of known identity, that is not listed in **A11.4.**, the values of A_1 and A_2 must be determined according to 49 CFR 173.433.

A11.4. Table A11.1. This table gives A_1 and A_2 values for radionuclides. This table also gives values on exempt material activity concentrations and exempt consignment activity limits for radionuclides.

Table A11.1. Table of A1 and A2 Values for Common Radionuclides.

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Ac-225[a]	Actinium (89)	0.8	0.006	1×10^{1}	1×10^{4}
Ac-227[a]		0.9	0.00009	1×10^{-1}	1×10^{3}
Ac-228		0.6	0.5	1×10^{1}	1×10^{6}
Ag-105	Silver (47)	2	2	1×10^{2}	1×10^{6}
Ag-108m[a]		0.7	0.7	1×10^{1b}	1×10^{6b}
Ag-110m[a]		0.4	0.4	1×10^{1}	1×10^{6}
Ag-111		2	0.6	1×10^{3}	1×10^{6}
Al-26	Aluminum (13)	0.1	0.1	1×10^{1}	1×10^{5}
Am-241	Americium (95)	10	0.001	1×10^{0}	1×10^{4}
Am-242m[a]		10	0.001	1×10^{0b}	1×10^{4b}
Am-243[a]		5	0.001	1×10^{0b}	1×10^{3b}
Ar-37	Argon (18)	40	40	1×10^{6}	1×10^{8}
Ar-39		40	20	1×10^{7}	1×10^{4}
Ar-41		0.3	0.3	1×10^{2}	1×10^{9}
As-72	Arsenic (33)	0.3	0.3	1×10^{1}	1×10^{5}
As-73		40	40	1×10^{3}	1×10^{7}
As-74		1	0.9	1×10^{1}	1×10^{6}
As-76		0.3	0.3	1×10^{2}	1×10^{5}
As-77		20	0.7	1×10^{3}	1×10^{6}
At-211	Astatine (85)	20	0.5	1×10^{3}	1×10^{7}
Au-193	Gold (79)	7	2	1×10^{2}	1×10^{7}
Au-194		1	1	1×10^{1}	1×10^{6}
Au-195		10	6	1×10^{2}	1×10^{7}
Au-198		1	0.6	1×10^{2}	1×10^{6}
Au-199		10	0.6	1×10^{2}	1×10^{6}
Ba-131[a]	Barium (56)	2	2	1×10^{2}	1×10^{6}
Ba-133		3	3	1×10^{2}	1×10^{6}
Ba-133m		20	0.6	1×10^{2}	1×10^{6}
Ba-140[a]		0.5	0.3	1×10^{1b}	1×10^{5b}
Be-7	Beryllium (4)	20	20	1×10^{3}	1×10^{7}

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Be-10		40	0.6	1×10^4	1×10^6
Bi-205	Bismuth (83)	0.7	0.7	1×10^1	1×10^6
Bi-206		0.3	0.3	1×10^1	1×10^5
Bi-207		0.7	0.7	1×10^1	1×10^6
Bi-210		1	0.6	1×10^3	1×10^6
Bi-210m[a]		0.6	0.02	1×10^1	1×10^5
Bi-212[a]		0.7	0.6	1×10^{1b}	1×10^{5b}
Bk-247	Berkelium (97)	8	0.0008	1×10^0	1×10^4
Bk-249[a]		40	0.3	1×10^3	1×10^6
Br-76	Bromine (35)	0.4	0.4	1×10^1	1×10^5
Br-77		3	3	1×10^2	1×10^6
Br-82		0.4	0.4	1×10^1	1×10^6
C-11	Carbon (6)	1	0.6	1×10^1	1×10^6
C-14		40	3	1×10^4	1×10^7
Ca-41	Calcium (20)	Unlimited	Unlimited	1×10^5	1×10^7
Ca-45		40	1	1×10^4	1×10^7
Ca-47[a]		3	0.3	1×10^1	1×10^6
Cd-109	Cadmium (48)	30	2	1×10^4	1×10^6
Cd-113m		40	0.5	1×10^3	1×10^6
Cd-115 [a]		3	0.4	1×10^2	1×10^6
Cd-115m		0.5	0.5	1×10^3	1×10^6
Ce-139	Cerium (58)	7	2	1×10^2	1×10^6
Ce-141		20	0.6	1×10^2	1×10^7
Ce-143		0.9	0.6	1×10^2	1×10^6
Ce-144[a]		0.2	0.2	1×10^{2b}	1×10^{5b}
Cf-248	Californium (98)	40	0.006	1×10^1	1×10^4
Cf-249		3	0.0008	1×10^0	1×10^3
Cf-250		20	0.002	1×10^1	1×10^4
Cf-251		7	0.0007	1×10^0	1×10^3
Cf-252		0.1	0.003	1×10^1	1×10^4
Cf-253[a]		40	0.04	1×10^2	1×10^5

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Cf-254		0.001	0.001	1×10^0	1×10^3
Cl-36	Chlorine (17)	10	0.6	1×10^4	1×10^6
Cl-38		0.2	0.2	1×10^1	1×10^5
Cm-240	Curium (96)	40	0.02	1×10^2	1×10^5
Cm-241		2	1	1×10^2	1×10^6
Cm-242		40	0.01	1×10^2	1×10^5
Cm-243		9	0.001	1×10^0	1×10^4
Cm-244		20	0.002	1×10^1	1×10^4
Cm-245		9	0.0009	1×10^0	1×10^3
Cm-246		9	0.0009	1×10^0	1×10^3
Cm-247[a]		3	0.001	1×10^0	1×10^4
Cm-248		0.02	0.0003	1×10^0	1×10^3
Co-55	Cobalt (27)	0.5	0.5	1×10^1	1×10^6
Co-56		0.3	0.3	1×10^1	1×10^5
Co-57		10	10	1×10^2	1×10^6
Co-58m		40	40	1×10^4	1×10^7
Co-58		1	1	1×10^1	1×10^6
Co-60		0.4	0.4	1×10^1	1×10^5
Cr-51	Chromium (24)	30	30	1×10^3	1×10^7
Cs-129	Cesium (55)	4	4	1×10^2	1×10^5
Cs-131		30	30	1×10^3	1×10^6
Cs-132		1	1	1×10^3	1×10^6
Cs-134		0.7	0.7	1×10^1	1×10^4
Cs-134m		40	0.6	1×10^3	1×10^5
Cs-135		40	1	1×10^4	1×10^7
Cs-136		0.5	0.5	1×10^1	1×10^5
Cs-137[a]		2	0.6	1×10^{1b}	1×10^{4b}
Cu-64	Copper (29)	6	1	1×10^2	1×10^6
Cu-67		10	0.7	1×10^2	1×10^6
Dy-159	Dysprosium (66)	20	20	1×10^3	1×10^7
Dy-165		0.9	0.6	1×10^3	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Dy-166[a]		0.9	0.3	1×10^3	1×10^6
Er-169	Erbium (68)	40	1	1×10^4	1×10^7
Er-171		0.8	0.5	1×10^2	1×10^6
Eu-147	Europium (63)	2	2	1×10^2	1×10^6
Eu-148		0.5	0.5	1×10^1	1×10^6
Eu-149		20	20	1×10^2	1×10^7
Eu-150 (short lived)		2	0.7	1×10^3	1×10^6
Eu-150 (long lived)		0.7	0.7	1×10^1	1×10^6
Eu-152		1	1	1×10^1	1×10^6
Eu-152m		0.8	0.8	1×10^2	1×10^6
Eu-154		0.9	0.6	1×10^1	1×10^6
Eu-155		20	3	1×10^2	1×10^7
Eu-156		0.7	0.7	1×10^1	1×10^6
F-18	Fluorine (9)	1	0.6	1×10^1	1×10^6
Fe-52[a]	Iron (26)	0.3	0.3	1×10^1	1×10^6
Fe-55		40	40	1×10^4	1×10^6
Fe-59		0.9	0.9	1×10^1	1×10^6
Fe-60[a]		40	0.2	1×10^2	1×10^5
Ga-67	Gallium (31)	7	3	1×10^2	1×10^6
Ga-68		0.5	0.5	1×10^1	1×10^5
Ga-72		0.4	0.4	1×10^1	1×10^5
Gd-146[a]	Gadolinium (64)	0.5	0.5	1×10^1	1×10^6
Gd-148		20	0.002	1×10^1	1×10^4
Gd-153		10	9	1×10^2	1×10^7
Gd-159		3	0.6	1×10^3	1×10^6
Ge-68[a]	Germanium (32)	0.5	0.5	1×10^1	1×10^5
Ge-71		40	40	1×10^4	1×10^8
Ge-77		0.3	0.3	1×10^1	1×10^5
Hf-172[a]	Hafnium (72)	0.6	0.6	1×10^1	1×10^6
Hf-175		3	3	1×10^2	1×10^6
Hf-181		2	0.5	1×10^1	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Hf-182		Unlimited	Unlimited	1×10^2	1×10^6
Hg-194[a]	Mercury (80)	1	1	1×10^1	1×10^6
Hg-195m[a]		3	0.7	1×10^2	1×10^6
Hg-197m		10	0.4	1×10^2	1×10^6
Hg-197		20	10	1×10^2	1×10^7
Hg-203		5	1	1×10^2	1×10^5
Ho-166	Holmium (67)	0.4	0.4	1×10^3	1×10^5
Ho-166m		0.6	0.5	1×10^1	1×10^6
I-123	Iodine (53)	6	3	1×10^2	1×10^7
I-124		1	1	1×10^1	1×10^6
I-125		20	3	1×10^3	1×10^6
I-126		2	1	1×10^2	1×10^6
I-129		Unlimited	Unlimited	1×10^2	1×10^5
I-131		3	0.7	1×10^2	1×10^6
I-132		0.4	0.4	1×10^1	1×10^5
I-133		0.7	0.6	1×10^1	1×10^6
I-134		0.3	0.3	1×10^1	1×10^5
I-135[a]		0.6	0.6	1×10^1	1×10^6
In-111	Indium (49)	3	3	1×10^2	1×10^6
In-113m		4	2	1×10^2	1×10^6
In-114m[a]		10	0.5	1×10^2	1×10^6
In-115m		7	1	1×10^2	1×10^6
Ir-189[a]	Iridium (77)	10	10	1×10^2	1×10^7
Ir-190		0.7	0.7	1×10^1	1×10^6
Ir-192		1[c]	0.6	1×10^1	1×10^4
Ir-194		0.3	0.3	1×10^2	1×10^5
K-40	Potassium (19)	0.9	0.9	1×10^2	1×10^6
K-42		0.2	0.2	1×10^2	1×10^6
K-43		0.7	0.6	1×10^1	1×10^6
Kr-81	Krypton (36)	40	40	1×10^4	1×10^7
Kr-85m		8	3	1×10^3	1×10^{10}

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Kr-85		10	10	1×10^5	1×10^4
Kr-87		0.2	0.2	1×10^2	1×10^9
La-137	Lanthanum (57)	30	6	1×10^3	1×10^7
La-140		0.4	0.4	1×10^1	1×10^5
LSA		Note 4	Note 4		
Lu-172	Lutetium (71)	0.6	0.6	1×10^1	1×10^6
Lu-173		8	8	1×10^2	1×10^7
Lu-174m		20	10	1×10^2	1×10^7
Lu-174		9	9	1×10^2	1×10^7
Lu-177		30	0.7	1×10^3	1×10^7
MFP	Mixed Fission Products	Note 3	Note 3		
Mg-28[a]	Magnesium (12)	0.3	0.3	1×10^1	1×10^5
Mn-52	Manganese (25)	0.3	0.3	1×10^1	1×10^5
Mn-53		Unlimited	Unlimited	1×10^4	1×10^9
Mn-54		1	1	1×10^1	1×10^6
Mn-56		0.3	0.3	1×10^1	1×10^5
Mo-93	Molybdenum (42)	40	20	1×10^3	1×10^8
Mo-99[a]		1	0.6	1×10^2	1×10^6
N-13	Nitrogen (7)	0.9	0.6	1×10^2	1×10^9
Na-22	Sodium (11)	0.5	0.5	1×10^1	1×10^6
Na-24		0.2	0.2	1×10^1	1×10^5
Nb-93m	Niobium (41)	40	30	1×10^4	1×10^7
Nb-94		0.7	0.7	1×10^1	1×10^6
Nb-95		1	1	1×10^1	1×10^6
Nb-97		0.9	0.6	1×10^1	1×10^6
Nd-147	Neodymium (60)	6	0.6	1×10^2	1×10^6
Nd-149		0.6	0.5	1×10^2	1×10^6
Ni-59	Nickel (28)	Unlimited	Unlimited	1×10^4	1×10^8
Ni-63		40	30	1×10^5	1×10^8
Ni-65		0.4	0.4	1×10^1	1×10^6
Np-235	Neptunium (93)	40	40	1×10^3	1×10^7

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Np-236 (short lived)		20	2	1×10^3	1×10^7
Np-236 (long lived)		9	0.02	1×10^2	1×10^5
Np-237		20	0.002	1×10^{0b}	1×10^{3b}
Np-239		7	0.4	1×10^2	1×10^7
Os-185	Osmium (76)	1	1	1×10^1	1×10^6
Os-191m		40	30	1×10^3	1×10^7
Os-191		10	2	1×10^2	1×10^7
Os-193		2	0.6	1×10^2	1×10^6
Os-194[a]		0.3	0.3	1×10^2	1×10^5
P-32	Phosphorus (15)	0.5	0.5	1×10^3	1×10^5
P-33		40	1	1×10^5	1×10^8
Pa-230[a]	Protactinium (91)	2	0.07	1×10^1	1×10^6
Pa-231		4	0.0004	1×10^0	1×10^3
Pa-233		5	0.7	1×10^2	1×10^7
Pb-201	Lead (82)	1	1	1×10^1	1×10^6
Pb-202		40	20	1×10^3	1×10^6
Pb-203		4	3	1×10^2	1×10^6
Pb-205		Unlimited	Unlimited	1×10^4	1×10^7
Pb-210[a]		1	0.05	1×10^{1b}	1×10^{4b}
Pb-212 [a]		0.7	0.2	1×10^{1b}	1×10^{5b}
Pd-103	Palladium (46)	40	40	1×10^3	1×10^8
Pd-107		Unlimited	Unlimited	1×10^5	1×10^8
Pd-109		2	0.5	1×10^3	1×10^6
Pm-143	Promethium (61)	3	3	1×10^2	1×10^6
Pm-144		0.7	0.7	1×10^1	1×10^6
Pm-145		30	10	1×10^3	1×10^7
Pm-147		40	2	1×10^4	1×10^7
Pm-148m[a]		0.8	0.7	1×10^1	1×10^6
Pm-149		2	0.6	1×10^3	1×10^6
Pm-151		2	0.6	1×10^2	1×10^6
Po-210	Polonium (84)	40	0.02	1×10^1	1×10^4

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Pr-142	Praseodymium (59)	0.4	0.4	1×10^2	1×10^5
Pr-143		3	0.6	1×10^4	1×10^6
Pt-188[a]	Platinum (78)	1	0.8	1×10^1	1×10^6
Pt-191		4	3	1×10^2	1×10^6
Pt-193m		40	0.5	1×10^3	1×10^7
Pt-193		40	40	1×10^4	1×10^7
Pt-195m		10	0.5	1×10^2	1×10^6
Pt-197m		10	0.6	1×10^2	1×10^6
Pt-197		20	0.6	1×10^3	1×10^6
Pu-236	Plutonium (94)	30	0.003	1×10^1	1×10^4
Pu-237		20	20	1×10^3	1×10^7
Pu-238		10	0.001	1×10^0	1×10^4
Pu-239		10	0.001	1×10^0	1×10^4
Pu-240		10	0.001	1×10^0	1×10^3
Pu-241[a]		40	0.06	1×10^2	1×10^5
Pu-242		10	0.001	1×10^0	1×10^4
Pu-244[a]		0.4	0.001	1×10^0	1×10^4
Ra-223[a]	Radium (88)	0.4	0.007	1×10^{2b}	1×10^{5b}
Ra-224 [a]		0.4	0.02	1×10^{1b}	1×10^{5b}
Ra-225 [a]		0.2	0.004	1×10^2	1×10^5
Ra-226 [a]		0.2	0.003	1×10^{1b}	1×10^{4b}
Ra-228 [a]		0.6	0.02	1×10^{1b}	1×10^{5b}
Rb-81	Rubidium (37)	2	0.8	1×10^1	1×10^6
Rb-83[a]		2	2	1×10^2	1×10^6
Rb-84		1	1	1×10^1	1×10^6
Rb-86		0.5	0.5	1×10^2	1×10^5
Rb-87		Unlimited	Unlimited	1×10^4	1×10^7
Rb (natural)		Unlimited	Unlimited	1×10^4	1×10^7
Re-184	Rhenium (75)	1	1	1×10^1	1×10^6
Re-184m		3	1	1×10^2	1×10^6
Re-186		2	0.6	1×10^3	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Re-187		Unlimited	unlimited	1×10^6	1×10^9
Re-188		0.4	0.4	1×10^2	1×10^5
Re-189[a]		3	0.6	1×10^2	1×10^6
Re (natural)		Unlimited	Unlimited	1×10^6	1×10^9
Rh-99	Rhodium (45)	2	2	1×10^1	1×10^6
Rh-101		4	3	1×10^2	1×10^7
Rh-102		0.5	0.5	1×10^1	1×10^6
Rh-102m		2	2	1×10^2	1×10^6
Rh-103m		40	40	1×10^4	1×10^8
Rh-105		10	0.8	1×10^2	1×10^7
Rn-222[a]	Radon (86)	0.3	0.004	1×10^{1b}	1×10^{8b}
Ru-97	Ruthenium (44)	5	5	1×10^2	1×10^7
Ru-103[a]		2	2	1×10^2	1×10^6
Ru-105		1	0.6	1×10^1	1×10^6
Ru-106 [a]		0.2	0.2	1×10^{2b}	1×10^{5b}
S-35	Sulphur (16)	40	3	1×10^5	1×10^8
Sb-122	Antimony (51)	0.4	0.4	1×10^2	1×10^4
Sb-124		0.6	0.6	1×10^1	1×10^6
Sb-125		2	1	1×10^2	1×10^6
Sb-126		0.4	0.4	1×10^1	1×10^5
Sc-44	Scandium (21)	0.5	0.5	1×10^1	1×10^5
Sc-46		0.5	0.5	1×10^1	1×10^6
Sc-47		10	0.7	1×10^2	1×10^6
Sc-48		0.3	0.3	1×10^1	1×10^5
SCO		Note 5	Note 5		
Se-75	Selenium (34)	3	3	1×10^2	1×10^6
Se-79		40	2	1×10^4	1×10^7
Si-31	Silicon (14)	0.6	0.6	1×10^3	1×10^6
Si-32		40	0.5	1×10^3	1×10^6
Sm-145	Samarium (62)	10	10	1×10^2	1×10^7
Sm-147		Unlimited	Unlimited	1×10^1	1×10^4

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Sm-151		40	10	1×10^4	1×10^8
Sm-153		9	0.6	1×10^2	1×10^6
Sn-113[a]	Tin (50)	4	2	1×10^3	1×10^7
Sn117m		7	0.4	1×10^2	1×10^6
Sn-119m		40	30	1×10^3	1×10^7
Sn-121m[a]		40	0.9	1×10^3	1×10^7
Sn-123		0.8	0.6	1×10^3	1×10^6
Sn-125		0.4	0.4	1×10^2	1×10^5
Sn-126[a]		0.6	0.4	1×10^1	1×10^5
Sr-82[a]	Strontium (38)	0.2	0.2	1×10^1	1×10^5
Sr-85m		5	5	1×10^2	1×10^7
Sr-85		2	2	1×10^2	1×10^6
Sr-87m		3	3	1×10^2	1×10^6
Sr-89		0.6	0.6	1×10^3	1×10^6
Sr-90[a]		0.3	0.3	1×10^{2b}	1×10^{4b}
Sr-91[a]		0.3	0.3	1×10^1	1×10^5
Sr-92[a]		1	0.3	1×10^1	1×10^6
T (All Forms) (see note)	Tritium (1)	40	40	1×10^6	1×10^9
Ta-178 (long lived)	Tantalum (73)	1	0.8	1×10^1	1×10^6
Ta-179		30	30	1×10^3	1×10^7
Ta-182		0.9	0.5	1×10^1	1×10^4
Tb-157	Terbium (65)	40	40	1×10^4	1×10^7
Tb-158		1	1	1×10^1	1×10^6
Tb-160		1	0.6	1×10^1	1×10^6
Tc-95m [a]	Technetium (43)	2	2	1×10^1	1×10^6
Tc-96m [a]		0.4	0.4	1×10^3	1×10^7
Tc-96		0.4	0.4	1×10^1	1×10^6
Tc-97m		40	1	1×10^3	1×10^7
Tc-97		Unlimited	Unlimited	1×10^3	1×10^8
Tc-98		0.8	0.7	1×10^1	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Tc-99m		10	4	1×10^2	1×10^7
Tc-99		40	0.9	1×10^4	1×10^7
Te-121m	Tellurium (52)	5	3	1×10^2	1×10^5
Te-121		2	2	1×10^1	1×10^6
Te-123m		8	1	1×10^2	1×10^7
Te-125m		20	0.9	1×10^3	1×10^7
Te-127m[a]		20	0.5	1×10^3	1×10^7
Te-127		20	0.7	1×10^3	1×10^6
Te-129m[a]		0.8	0.4	1×10^3	1×10^6
Te-129		0.7	0.6	1×10^2	1×10^6
Te-131m[a]		0.7	0.5	1×10^1	1×10^6
Te-132[a]		0.5	0.4	1×10^2	1×10^7
Th-227	Thorium (90)	10	0.005	1×10^1	1×10^4
Th-228[a]		0.5	0.001	1×10^{0b}	1×10^{4b}
Th-229		5	0.0005	1×10^{0b}	1×10^{3b}
Th-230		10	0.001	1×10^0	1×10^4
Th-231		40	0.02	1×10^3	1×10^7
Th-232		Unlimited	Unlimited	1×10^1	1×10^4
Th-234[a]		0.3	0.3	1×10^{3b}	1×10^{5b}
Th (natural)		Unlimited	Unlimited	1×10^{0b}	1×10^{3b}
Ti-44[a]	Titanium (22)	0.5	0.4	1×10^1	1×10^5
Tl-200	Thallium (81)	0.9	0.9	1×10^1	1×10^6
Tl-201		10	4	1×10^2	1×10^6
Tl-202		2	2	1×10^2	1×10^6
Tl-204		10	0.7	1×10^4	1×10^4
Tm-167	Thulium (69)	7	0.8	1×10^2	1×10^6
Tm-170		3	0.6	1×10^3	1×10^6
Tm-171		40	40	1×10^4	1×10^8
U-230 (fast lung absorption)[a, d]	Uranium (92)	40	0.1	1×10^{1b}	1×10^{5b}
U-230 (medium lung absorption)[a, e]		40	0.004	1×10^1	1×10^4

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
U-230 (slow lung absorption)[a, f]		30	0.003	1×10^1	1×10^4
U-232 (fast lung absorption)[d]		40	0.01	1×10^{0b}	1×10^{3b}
U-232 (medium lung absorption)[e]		40	0.007	1×10^1	1×10^4
U-232 (slow lung absorption)[f]		10	0.001	1×10^1	1×10^4
U-233 (fast lung absorption)[d]		40	0.09	1×10^1	1×10^4
U-233 (medium lung absorption)[e]		40	0.02	1×10^2	1×10^5
U-233 (slow lung absorption)[f]		40	0.006	1×10^1	1×10^5
U-234 (fast lung absorption) [d]		40	0.09	1×10^1	1×10^4
U-234 (medium lung absorption)[e, f]		40	0.02	1×10^2	1×10^5
U-234 (slow lung absorption)[f]		40	0.006	1×10^1	1×10^5
U-235 (all lung absorption types) [a, d, e, f]		Unlimited	Unlimited	1×10^{1b}	1×10^{4b}
U-236 (fast lung absorption) [d]		Unlimited	Unlimited	1×10^1	1×10^4
U-236 (medium lung absorption)[e]		40	0.02	1×10^2	1×10^5
U-236 (slow lung absorption)[f]		40	0.006	1×10^1	1×10^4
U-238(all lung absorption types)[d, e, f]		Unlimited	Unlimited	1×10^{1b}	1×10^{4b}
U (natural)		Unlimited	Unlimited	1×10^{0b}	1×10^{3b}
U (enriched 20% or less)[g]		Unlimited	Unlimited	1×10^0	1×10^3
U (depleted)		Unlimited	Unlimited	1×10^0	1×10^3
V-48	Vanadium (23)	0.4	0.4	1×10^1	1×10^5

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
V-49		40	40	1×10^4	1×10^7
W-178	Tungsten (74)	9	5	1×10^1	1×10^6
W-181		30	30	1×10^3	1×10^7
W-185		40	0.8	1×10^4	1×10^7
W-187		2	0.6	1×10^2	1×10^6
W-188[a]		0.4	0.3	1×10^2	1×10^5
Xe-122[a]	Xenon (54)	0.4	0.4	1×10^2	1×10^9
Xe-123		2	0.7	1×10^2	1×10^9
Xe-127		4	2	1×10^3	1×10^5
Xe-131m		40	40	1×10^4	1×10^4
Xe-133		20	10	1×10^3	1×10^4
Xe-135		3	2	1×10^3	1×10^{10}
Y-87[a]	Yttrium (39)	1	1	1×10^1	1×10^6
Y-88		0.4	0.4	1×10^1	1×10^6
Y-90		0.3	0.3	1×10^3	1×10^5
Y-91m		2	2	1×10^2	1×10^6
Y-91		0.6	0.6	1×10^3	1×10^6
Y-92		0.2	0.2	1×10^2	1×10^5
Y-93		0.3	0.3	1×10^2	1×10^5
Yb-169	Ytterbium (70)	4	1	1×10^2	1×10^7
Yb-175		30	0.9	1×10^3	1×10^7
Zn-65	Zinc (30)	2	2	1×10^1	1×10^6
Zn-69m		3	0.6	1×10^2	1×10^6
Zn-69		3	0.6	1×10^4	1×10^6
Zr-88	Zirconium (40)	3	3	1×10^2	1×10^6
Zr-93		Unlimited	Unlimited	1×10^{3b}	1×10^{7b}
Zr-95[a]		2	0.8	1×10^1	1×10^6
Zr-97[a]		0.4	0.4	1×10^{1b}	1×10^{5b}

NOTES:

a A_1 and/or A_2 values include contributions from daughter nuclides with half-lives less than 10 days.

b Parent nuclides and their progeny included in secular equilibrium are listed in the following:

Sr-90 --- Y-90

Zr-93 --- Nb-93m

Zr-97 --- Nb-97

Ru-106 --- Rh-106

Cs-137 --- Ba-137m

Ce-134 --- La-134

Ce-144 --- Pr-144

Ba-140 --- La-140

Bi-212 --- Tl-208 (0.36), Po-212 (0.64)

Pb-210 --- Bi-210, Po-210

Pb-212 --- Bi-212, Tl-208 (0.36), Po-212 (0.64)

Rn-220 --- Po-216

Rn-222 --- Po-218, Pb-214, Bi-214, Po-214

Ra-223 --- Rn-219, Po-215, Pb-211, Bi-211, Tl-207

Ra-224 --- Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Ra-226 --- Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210

Ra-228 --- Ac-228

Th-226 --- Ra-222, Rn-218, Po-214

Th-228 --- Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Th-229 --- Ra-225, Ac-225, Fr-221, At-217, Bi-213, Po-213, Pb-209

Th-nat - Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Th-234 --- Pa-234m

U-230 --- Th-226, Ra-222, Rn-218, Po-214

U-232 --- Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

U-235 --- Th-231

U-238 --- Th-234, Pa-234m

U-nat --- Th-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210

U-240 --- Np-240m

Np-237--- Pa-233

Am-242m --- Am-242

Am-243 --- Np-239

[c] The quantity may be determined from a measurement of the rate of decay or a measurement of the radiation level at a prescribed distance from the source.

[d] These values apply only to compounds of uranium that take the chemical form of UF_6, $U0_2F_2$ and $UO_2(NO_3)_2$ in both normal and accident conditions of transport.

[e] These values apply only to compounds of uranium that take the chemical form of $U0_3$, UF_4, UCI_4 and hexavalent compounds in both normal and accident conditions of transport.

[f] These values apply to all compounds of uranium other than those specified in (d) and (e) above.

[g] These values apply to unirradiated uranium only.

1. In **Table A11.1.**, the symbols for the various radionuclides are styled thus "Ir-192". The alternative form of "192 Ir" is equally acceptable.

2. Tritium (T) is a synonym for the radionuclide Hydrogen-3.

3. For Mixed Fission Products values for A_1 and A_2 are calculated using the formula for mixtures found in 49 CFR 173.433(h).

4. For Low Specific Activity (LSA) material, consult IATA, section 10.3.5.

5. For Surface Contaminated Objects (SCO) consult IATA, section 10.3.6.

6. Type A packages must not contain activities greater than the following values: for special form radioactive material: A_1; or for all other radioactive materials: A_2.

A11.5. Excepted Packages. An Excepted Package is a packaging used for containing radioactive material, that is designed to meet the general packaging requirements of **A3.3.7.** as applicable.

A11.5.1. General Requirements. Radioactive materials in limited quantities, instruments, manufactured articles, and empty packagings may be transported as excepted packages, provided that:

A11.5.1.1. The radiation level at any point on the external surface of the package is not over 5 µSv/h (0.5 mrem/h).

A11.5.1.2. If the excepted package contains fissile material, the smallest dimension of the package must not be less than 10 cm.

A11.5.1.3. The nonfixed (removable) radioactive surface contamination on the external surface of the package is not over the limits specified in **A3.3.7.11.**

A11.5.2. Exceptions.

A11.5.2.1. Excepted packages are subject to the following:

A11.5.2.1.1. Package marking requirements in A14.4.6.6.

A11.5.2.1.2. Annotate the Military Shipping Label (MSL) with the word "Nonhazardous."

A11.5.2.1.3. Reporting accidents/incidents.

A11.5.2.1.4. The materials are packaged in strong, tight packages that will not leak any of the radioactive materials under normal transportation conditions. Packaging must meet the general requirements of **A3.3.7.2.**

A11.5.2.2. Excepted packages are not subject to the following:

A11.5.2.2.1. Specification Packaging.

A11.5.2.2.2. Marking requirements (except A14.4.6.6.).

A11.5.2.2.3. Labeling requirements.

A11.5.2.2.4. Shipper's Declaration for Dangerous Goods requirements.

A11.5.3. Other Hazards. For excepted packages of radioactive materials possessing any other dangerous characteristics, the other hazard takes precedence. Therefore, the package is subject to the Regulations relevant to the other hazard.

A11.5.4. Radioactive Materials in Limited Quantities. Radioactive material whose activities do not exceed the relevant exception limits listed in the column headed "Materials – Package Limits" in **Table A11.7.** may be transported in an excepted package, provided that:

A11.5.4.1. These materials are packaged in such a manner that, in conditions likely to be encountered during routine transport (incident-free conditions), there can be no leakage of radioactive material from the package.

A11.5.4.2. The package bears the marking "RADIOACTIVE" on an internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package.

A11.5.5. Instruments and Manufactured Articles. Instruments and manufactured articles (including clocks, electronic tubes, or apparatus) or similar devices having radioactive materials in gaseous or nondispersible solid form as a component part may be transported in an excepted package if:

A11.5.5.1. Each package meets the general requirements of **A3.3.7.2.**

A11.5.5.2. The activity of the instrument or article is not over the applicable limit listed in **Table A11.7.**

A11.5.5.3. The total activity per package is not over the applicable limit listed in **Table A11.7.**

A11.5.5.4. The active material is completely enclosed by a nonactive component.

A11.5.5.5. The radiation level at 10 cm (4 inches) from any point on the external surface of any unpackaged instrument or article is not over 0.1 mSv/h (10 mrem/h).

A11.5.5.6. Each instrument or article is marked "RADIOACTIVE" except:

A11.5.5.6.1. Radioluminescent time-pieces or devices.

A11.5.5.6.2. Consumer products that either have received regulatory approval, following their sale to the end user or do not individually exceed the activity limit for an exempt consignment in **Table A11.1.** provided such products are transported in a package that bears the marking "RADIOACTIVE" on an internal surface in such a manner that warning of the presence of radioactive material is visible upon opening the package.

A11.5.5.7. The active material is completely enclosed by non-active components (a device performing the sole function of containing radioactive material must not be considered to be an instrument or manufactured article).

Table A11.2. Activity Limits for Limited Quantities Instruments and Articles.

Nature of Contents	**Materials**	**Instruments and Articles**	
	Package Limits (Note 1)	**Limits for each instrument and article (Note 1)**	**Package Limits (Note 1)**
Solids			
Special Form	10^{-3} A_1	10^{-2} A_1	A_1
Other Form	10^{-3} A_2	10^{-2} A_2	A_2
Liquids			
Tritiated Water:			
<0.0037 TBq/liter (0.1 Ci/L)	37 TBq (1000 Ci)		
0.0037 TBq to 0.037 TBq/L (0.1 Ci to 1.0 Ci/L)	3.7 TBq (100 Ci)		
>0.037 TBq/L (1.0 Ci/L)	0.037 TBq (1 Ci)		
Other Liquids	10^{-4} A_2	10^{-3} A_2	10^{-1} A_2
Gases			
Tritium (Note 2)	2×10^{-2} A_2	2×10^{-2} A_2	2×10^{-1} A_2
Special Form	10^{-3} A_1	10^{-3} A_1	10^{-2} A_1
Other Forms	10^{-3} A_2	10^{-3} A_2	10^{-2} A_2

NOTES:

1. For mixture of radionuclides see 49 CFR 173.433(d).
2. These values also apply to tritium in activated luminous paint and tritium absorbed on solid carriers.

A11.5.6. Articles Manufactured from Natural Uranium, Depleted Uranium, or Natural Thorium. Manufactured articles, in which the sole radioactive material is unirradiated natural uranium, unirradiated depleted uranium, or unirradiated natural thorium, may be transported as an excepted package, provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

A11.5.7. Empty Packages. An empty packaging which had previously contained radioactive material may be transported as an excepted package if the following conditions are met:

A11.5.7.1. It is in a well-maintained condition and securely closed.

A11.5.7.2. The outer surface of any uranium or thorium in its structure is covered with an active sheath made of metal or some other substantial material.

A11.5.7.3. The level of internal non-fixed contamination does not exceed one hundred times the levels specified in **A3.3.7.22.** for an excepted package.

A11.5.7.4. Hazardous materials labels used on the package previously are removed or no longer visible.

A11.5.8. Activity Limit Per Package.

A11.5.8.1. Excepted Package of Radioactive Material. For radioactive material other than articles manufactured of natural uranium, or natural thorium, an excepted package must not contain activities greater than the following:

A11.5.8.1.1. Where the radioactive material is enclosed in, or forms a component part of an instrument or other manufactured article, such as a clock or electronic apparatus, the limits specified in **A11.5.5.** for each individual item and each package respectively.

A11.5.8.1.2. Where the radioactive material is not so enclosed in or is not included as a component of an instrument or other manufactured article, the limits specified in **A11.5.4.**

A11.5.8.2. Manufactured Articles. For articles manufactured of natural uranium, depleted uranium, or natural thorium, an excepted package may contain any quantity of such material provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

A11.6. Industrial Packaging. Industrial Packaging may be used for Low Specific Activity (LSA) material and Surface Contaminated Objects (SCO). LSA and SCO materials must not be transported unpackaged.

A11.6.1. Activity Limit. The total activity in a single package of LSA material or in a single package of SCO must be so restricted that the radiation level specified in **A11.6.5.** is not exceeded, and the activity in a single package must also be so restricted that the activity limits for an aircraft specified in Table A11.10 are not exceeded. A single package of non-combustible solid LSA-II or LSA-III material shall not contain an activity greater than 3,000 A_2.

Table A11.3. Aircraft Activity Limits for LSA Material and SCO in Industrial Packages

Nature of Material	Activity Limit Per Aircraft
LSA-I	No Limit
LSA-II and LSA-III non-combustible solids	No Limit
LSA-II and LSA-III combustible solids, and all liquids and gases	100 A_2
SCO	100 A_2

A11.6.2. Industrial Package Type 1. A packaging or freight container containing LSA material or SCO that is designed to meet the requirements of 49 CFR 173.411 is an Industrial Package Type 1 (Type IP-1).

A11.6.3. Industrial Package Type 2. A packaging or freight container containing LSA material or SCO that is designed to meet the requirements of 49 CFR 173.411 is an Industrial Package Type 2.

A11.6.4. Industrial Package, Type 3. A packaging or freight container containing LSA material or SCO that is designed to meet the requirements of 49 CFR 173.411 is an Industrial Package Type 3.

A11.6.5. LSA and SCO Quantity Limit. The quantity of LSA material or SCO in a single Industrial Package Type 1, Industrial Package Type 2, or Industrial Package Type 3 must be so restricted that the external radiation level at 3m (10 ft) from the unshielded material does not exceed 10 mSv/h (1 rem/h).

A11.6.6. LSA and SCO – Fissile. LSA material and SCO which is, or contains, fissile material, must meet the applicable requirements of either 49 CFR 173.457 or 10 CFR, PART 71.

A11.6.7. LSA and SCO – Restrictions. Packages and Freight containers containing LSA material or SCO must meet the requirements of **A3.3.7.22.** and **A3.3.7.17.** LSA material in group LSA-I and SCO in group SCO-I must not be transported unpackaged.

A11.6.8. LSA and SCO – Integrity Limits. LSA material and SCO must be packaged in accordance with **Table A11.8.**

Table A11.4. Industrial Package Integrity Requirements for LSA and SCO.

Contents	Industrial Package Type	
	Exclusive Use	NOT Under Exclusive Use
LSA-I:		
Solid	Type 1	Type 1
Liquid	Type 1	Type 2
LSA-II		
Solid	Type 2	Type 2
Liquid and gas	Type 2	Type 3
LSA-III	Type 2	Type 3
SCO-I	Type 1	Type 1
SCO-II	Type 2	Type 2

A11.7. Packages Containing Uranium Hexafluoride(fissile, fissile excepted, and nonfissile). The mass of uranium hexafluoride in a package shall not a value that would lead to a ullage smaller than 5% at the maximum temperature of the package as specified for the plant systems where the package shall be used. The uranium hexafluoride shall be in solid form and the internal pressure of the package shall be below atmospheric pressure when presented for transport. Prepare this material for military air shipment according to 49 CFR 173.420.

A11.8. Authorized Type A Packages. Use the following packages for shipment, if they do not contain quantities over A_1 or A_2 as appropriate:

A11.8.1. DOT 7A packaging. DOT 7A packaging designed according to the requirements of 49 CFR 178.350 in effect after 30 June 1983.

A11.8.2. Any Type A packaging authorized in 49 CFR 173.415.

A11.8.3. For fissile material, any Type A packaging that meets the applicable standards for fissile materials in 10 CFR Part 71 and authorized in 49 CFR 173.471.

A11.8.4. Type B, B(U), or B(M) Packaging. Any Type B, B(U), or B(M) packaging, authorized in **A11.9.2.1.** or **A11.9.2.2.**

A11.8.5. Foreign-Made Packaging. Any foreign-made packaging that meets the standards of IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1"* and bears the marking "Type A" used for the import of radioactive materials. The packaging must conform to the requirements of the country of origin (as indicated by the packaging marking) and the IAEA regulations applicable to Type A packaging.

A11.9. Type B Packages.

A11.9.1. Activity Limits. Type B(U) and B(M) must not contain activities greater than the following:

A11.9.1.1. Low dispersible material - as authorized for the package design.

A11.9.1.2. Special Form Radioactive Material – 3,000 A_1 or 100,000 A_2, whichever is lower.

A11.9.1.3. All other radioactive material – 3,000 A_2.

A11.9.2. Authorized Packages. Use the following packages for shipment of quantities over A_1 or A_2, as appropriate:

A11.9.2.1. Any Type B, Type B(U), or Type B(M) packaging that meets the applicable requirements in 10 CFR part 71 and has been approved by the US Nuclear Regulatory Commission may be shipped per 49 CFR 173.471.

A11.9.2.2. Any Type B, B(U) or B(M) packaging that meets the applicable requirements of the regulations of the IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by DOT according to 49 CFR 173.473. Authorized only for export and import shipments.

A11.9.2.3. DOT 6M metal packaging that meets the requirements of 49 CFR 173.416. This package is authorized for use until 1 October, 2008 if it conforms in all respects to the requirements of this subchapter in effect in 1 October, 2003, for solid or gaseous radioactive materials that will not undergo pressure generating decomposition at temperatures up to 121 degrees C (250 degrees F) and do not generate more than 10 watts of radioactive decay heat.

A11.9.2.4. DOT 20WC with Inner DOT 2R. DOT 20WC, wooden protective jacket, when used with a single, snug-fitting inner DOT 2R. For liquid contents, the inner packaging must comply with 49 CFR 173.416. Not authorized for special form radioactive material. This package is authorized for use until 1 Oct 2008 if it conforms in all respects to the requirements of this subchapter in effect on October 1, 2003.

A11.9.2.5. DOT 20WC with Inner Type A Packaging. DOT 20WC, wooden protective jacket, with a single, snug-fitting inner Type A packaging that has a metal outer wall. Radioactive decay heat must not be over 100 watts. Authorized only for special form radioactive material. This package is authorized for use until 1 Oct 2008 if it conforms in all respects to the requirements of 49 CFR 173.416 in effect on October 1, 2003.

A11.9.2.6. DOT 21WC. DOT 21WC, wooden protective overpack, with a single inner DOT 2R. Contents must be loaded within the inner packaging in a manner to prevent loose movement during transportation. The inner packaging must be securely positioned and centered within the overpack so that there will be no significant displacement of the inner packaging if subjected to the 9 meter (30 feet) drop test described in 10 CFR Part 71. Authorized only for special form radioactive material. This package is authorized for use until 1 Oct 2008 if it conforms in all respects to the requirements of 49 CFR 173.416 in effect on October 1, 2003.

A11.10. Authorized Packaging-Fissile Materials.

A11.10.1. Except as provided in **A3.3.7.6.1.**, package fissile materials containing not more than A_1 or A_2 (as appropriate) in:

A11.10.1.1. DOT 6L, metal packaging that meets the requirements of 49 CFR 173.417. This package is authorized for use until 1 October, 2008 if it conforms in all respects to the requirements of this subchapter in effect in 1 October, 2003.

A11.10.1.2. DOT 6M, metal packaging, for materials in that meets the requirements of 49 CFR 173.417. This package is authorized for use until 1 October, 2008 if it conforms in all respects to the requirements of this subchapter in effect in 1 October, 2003.

A11.10.1.3. Any packaging listed in **A11.8.**, limited to radioactive materials specified in 10 CFR Part 71, Subpart C.

A11.10.1.4. Any other Type AF, Type BF, Type B(U)F, or Type B(M)F packaging for fissile radioactive materials that also meets the applicable standards for fissile materials in 10 CFR Part 71.

A11.10.1.5. Any other Type AF, Type B(U)F, or Type B(M)F packaging that also meets the applicable requirements for fissile material packaging in section VI of the IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by the DOT according to 49 CFR 173.473. Authorized only for export and import shipments.

A11.10.1.6. A 208 L (55 gallon) steel drum (1A2) that meets the requirements of 49 CFR 173.417. This package is authorized for use until 1 October, 2008 if it conforms in all respects to the requirements of this subchapter in effect in 1 October, 2003, subject to the following conditions:

A11.10.1.6.1. Packaging must meet the PG I performance requirements.

A11.10.1.6.2. The quantity may not exceed 350 grams of uranium 235 in any nonpyrophoric form, enriched to any degree in the uranium 235 isotope.

A11.10.1.6.3. Each drum must have a minimum 18-gauge body and bottom head and 16-gauge removable top head with one or more corrugations in the cover near the periphery.

A11.10.1.6.4. Closures must conform to 49 CFR 178.504.

A11.10.1.6.5. At least four equally spaced 12 mm (0.5 inch) diameter vent holes must be provided on the sides of the drum near the top, each covered with weatherproof tape or equivalent device.

A11.10.1.6.6. Appropriate primary inner containment of the contents and sufficient packaging material, such as plastic or metal jars or cans, must be provided so that DOT 7A provisions are satisfied by the inner packaging.

A11.10.1.6.7. Each inner container must be capable of venting if subjected to the thermal test described in 10 CFR Part 71.

A11.10.1.6.8. Liquid contents must be packaged per 49 CFR 173.412.

A11.10.1.6.9. The maximum weight of contents including internal packaging must not be over 91 kgs (200 pounds) with fissile material content limited as shown in **Table A11.2.**

A11.10.1.7. Any metal cylinder that meets the performance requirements of **A11.5.** and 49 CFR 178.350 for DOT 7A Type A packaging may be used for the transport of residual "heels" of enriched solid uranium hexafluoride without a protective overpack per **Table A11.3.**:

Table A11.5. Fissile Material Content and Transport Index for UN 1A2 Package.

Maximum U-235 per Package (grams)	Minimum Transport Index per Package as Fissile Class II	Maximum Number of Packages Transported as a Fissile Material Controlled Shipment
350	1.8	72
300	1.0	129
250	0.5	256
200	0.3	500
150	0.1	500
100	0.1	500
50	Note 1	Note 2

NOTES:

1. Transport index is limited by the external radiation levels.
2. Maximum number is limited by the total transport index.

A11.10.1.8. DOT 20PF-1, 20PF-2, 20PF-3 or 21PF-1A, 21PF-1B, or 21PF-2 phenolic-foam insulated overpacks with snug fitting inner metal cylinders meeting all of the applicable requirements of **A3.3.7.12.**, **A3.3.7.16.**, and the following:

A11.10.1.8.1. Handling procedures and packaging criteria must comply with US Enrichment Corporation Report Number USEC-651 or ANSI N14.1.

A11.10.1.8.2. Quantities of uranium hexafluoride are authorized as shown in **Table A11.6.**, with each package assigned a minimum transport index as also shown.

Table A11.6. Allowable Content of Uranium Hexafluoride (UF6) "Heels" in a Specification 7A Cylinder.

Maximum Cylinder Diameter		Cylinder Volume		Maximum Uranium 235 Enrichment (Weight %)	Maximum "Heel" Weight Per Cylinder UF_6 Uranium ^{235}			
Inches	Centimeters	Cubic Feet	L		kg	(lb)	kg	(lb)
5	12.7	0.311	8.8	100.0	0.045	0.1	0.031	0.07
8	20.3	1.359	39	12.5	0.227	0.5	.019	0.04
12	30.5	2.410	68	5.0	0.454	1.0	.015	0.03
30	76	25.64	725	5.0	11.3	25	.383	0.84
48	122	108.9	3084	4.5	22.7	50	.690	1.52
		(10 ton)						
48	122	142.7	4041	4.5	22.7	50	.690	1.52
		(14 ton)						

A11.10.2. Fissile Radioactive Materials with Radioactive Content Over A1 or A_2. Package in either:

A11.10.2.1. DOT 6L Metal Packaging that meets the requirements of 49 CFR 173.417. This package is authorized for use until 1 October, 2008 if it conforms in all respects to the requirements of this subchapter in effect in 1 October, 2003.

A11.10.2.1.1. Authorized only for uranium-235, plutonium-239, or plutonium-241, as metal oxide, or compounds that do not decompose at temperatures up to 149 degrees C (300 degrees F).

A11.10.2.1.2. Radioactive decay heat output must not be more than 5 watts.

A11.10.2.1.3. Radioactive materials in normal form must be packaged in one or more tightly-sealed metal cans or polyethylene bottles within a DOT 2R containment vessel.

A11.10.2.1.4. Authorized contents are limited per **Table A11.4.**

Table A11.7. Authorized Contents in Kilograms (Kg) and Conditions for Specification 6L Packages.

Uranium-235		Plutonium		Minimum Fissile Transport Index	Maximum Number of Packages Transported as a Fissile Material Control Shipment
H/X<=3 (Note 1)	3 H/X<=10	H/X<=10	10<=H/X<=20		
14	3.6 (Note 2)	....	....	1.3	80
....	....	2.5	2.4	1.8	50

NOTES:

1. H/X is the ratio of hydrogen to fissile atoms in the inner containment with all sources of hydrogen in the containment considered.
2. Volume must not be over 3.6 liters.

A11.10.2.2. DOT 6M Metal Packaging that meets the requirements of 49 CFR 173.417. This package is authorized for use until 1 October, 2008 if it conforms in all respects to the requirements of this subchapter in effect in 1 October, 2003. Authorized only for solid radioactive materials that do not decompose at temperatures up to 121 degrees C (250 degrees F). Radioactive decay heat output must not exceed 10 watts. Radioactive materials in other than special form must be packaged in one or more tightly-sealed metal cans or polyethylene bottles within a DOT specification 2R containment vessel. The following applies:

A11.10.2.2.1. Limit packages of fissile material with a criticality TI equal to 0.0 to 1.6 kg of uranium 235; 0.9 kg of plutonium (except that due to the 10-watt thermal decay heat limitation, the limit for plutonium-238 is 0.02 kg); and 0.5 kg of uranium-233. The maximum ratio of hydrogen to fissile material must not be greater than three, including all of the sources of hydrogen within the DOT 2R containment vessel.

A11.10.2.2.2. Use **Table A11.5.** to determine maximum quantities of fissile material and other restrictions for materials with a criticality TI if greater than 0.0. The minimum transport index to be assigned per package and, for fissile material, controlled shipments, the allowable number of similar packages per transport vehicle is shown in **Table A11.5.** Where a maximum ratio of hydrogen to fissile material is specified in **Table A11.5.**, only the hydrogen interspersed with the fissile material has to be considered. For a uranium-233 shipment, the maximum inside diameter of the inner containment vessel must not be over 12.1 cm (4.75 inches). Where necessary, use a tight-fitting steel insert to reduce a larger diameter inner containment vessel to the 12 centimeters (4.75 inches) limit.

A11.10.2.3. Type B(U) or B(M) packaging that meets the standards for packaging of fissile materials in 10 CFR Part 71, and is approved by the US Nuclear Regulatory Commission per 49 CFR 173.471.

A11.10.2.4. Type B(U) or B(M) packaging that meets the applicable requirements for fissile radioactive materials in section VI of the IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by the DOT according to 49 CFR 173.473. Authorized only for export and import shipments.

A11.10.2.5. DOT 20PF-1, 20PF-2, 20PF-3, 21PF-1A, or 21PF-1B phenolic-foam insulated overpacks with snug fitting inner metal cylinders meeting all of the applicable requirements of **A3.3.7.12.**, **A3.3.7.16.**, and the following:

A11.10.2.5.1. Handling procedures and packaging criteria must comply with US Enrichment Corporation Report Number USEC-651 or ANSI Standard N14.1.

A11.10.2.5.2. Quantities of uranium hexafluoride are authorized as shown in **Table A11.6.**, with each package assigned a minimum transport index as also shown.

Table A11.8. Authorized Contents for Specification 6M Packages (note 1)

Uranium-233 (note 5)			**Uranium-235** (note 4 and 7)			**Plutonium** (note 2, 3, and 4)			**Minimum Transport Index**	**Maximum Number of Packages Transported as a Fissile Material Control Shipment**
Metal or Alloy	**Compounds**		**Metal or Alloy**	**Compounds**		**Metal or Alloy**	**Compounds**			
H/X = 0 (note 8)	**H/X = 0**	**H/X <=3**	**H/X = 0**	**H/X = 0**	**H/X <=3**	**H/X = 0**	**H/X = 0**	**H/X <=3**		
0.5	0.5	0.5	1.6	1.6	1.6	0.9 (note 9)	0.9 (note 9)	0.9 (note 9)	0	NA
3.6	4.4	2.9	7.2	7.6	5.3	3.1	4.1	3.4	0.1	1,250
4.2 (note 6)	5.2	3.5	8.7	9.6	6.4	3.4	4.5	4.1	0.2	625
5.2 (note 6)	6.8	4.5	11.2	13.9	8.3	4.2	---	4.5	0.5	250
---	---	---	13.5	16.0	10.1	4.5	---	---	1.0	125
---	---	---	---	26.0	16.1	---	---	---	5.0	25
---	---	---	---	32.0	19.5	---	---	---	10.0	12

NOTES:

1. Quantity in kg.
2. Minimum percentage of plutonium-240 is 5 weight percent.
3. 4.5 kilogram limitation of plutonium due to 10 watt decay heat limitation.
4. For a mixture of uranium-235 and plutonium, an equal amount of uranium-235 may be substituted for any portion pf plutonium authorized.
5. Maximum inside diameter of Specification 2R containment vessel must not be greater than 12.1 cm (4.75 inch) see **A11.10.2.**
6. Granulated or powdered metal with any particle less than 6.4 mm (0.25 inch) in the smallest dimension is not authorized.

7. Except for material with a criticality TI of 0.0, the maximum permitted uranium-235 enrichment is 93.5 percent.
8. H/X is ratio of hydrogen to fissile atoms in the inner containment.
9. For Pu-238, the limit is 0.02 kg due to the 10 watt thermal decay heat limitation.

Table A11.9. Authorized Quantities of Uranium Hexafluoride (UF6) as Fissile Class II.

	Maximum Inner Cylinder Diameter		**Maximum Weight of UF_6 Contents**			
Protective Overpack Specification Number	**Centimeter**	**Inch**	**Kilograms**	**Pounds**	**Maximum U^{235} Enrichment (weight %)**	**Minimum Transport Index**
20PF-1	12.7	5	25	55	100.0	0.1
20PF-2	20.3	8	116	255	12.5	0.4
20PF-3	30.5	12	209	460	5.0	1.1
21PF-1A or 21PF-1B (Note 1)	76 (Note 2)	30 (Note 2)	2,250	4,950	5.0	5.0
21PF-1A or 21PF-1B (Note 1)	76 (Note 3)	30 (Note 3)	2,282	5,020	5.0	5.0
21PF-2 (Notes 1)	76 (Note 2)	30 (Note 2)	2,250	4,950	5.0	5.0
21PF-2 (Note 1)	76 (Note 3)	30 (Note 3)	2,282	5,020	5.0	5.0

NOTES:

1. For 76 cm cylinders, the maximum permitted H/U atomic ratio is 0.088.
2. Model 30A inner cylinder (reference: USEC-651).
3. Model 30B inner cylinder (reference: USEC-651).

A11.11. Special Arrangement (Competent Authority Approval). If the radioactive material does not comply with any of the methods of packing provided in this manual, the material may be permitted to be transported by CAA. The provisions for carrying the radioactive material using a CAA must be approved by all countries concerned. These provisions must be adequate to ensure that the overall level of safety in transport and in-transit storage is at least equivalent to the level of safety which would be provided if all

the applicable requirements of these regulations had been met. Each consignment must have multilateral approval.

A11.12. Authorized Packaging-Pyrophoric Radioactive Materials. Package pyrophoric radioactive materials in quantities not over A_2 per package in DOT Type 7A packagings constructed of materials that do not react nor be decomposed by the contents. Contents must be:

A11.12.1. In solid form and must not be fissile unless excepted by **A3.3.7.6.2.**

A11.12.2. Contained in sealed and corrosion resistant receptacles with positive closures (friction or slip-fit covers or stoppers are not authorized).

A11.12.3. Free of water and any contaminants that increase the reactivity of the material.

A11.12.4. Made inert to prevent self-ignition during transport by either:

A11.12.4.1. Mixing with large volumes of inerting materials such as graphite or dry sand, or other suitable inerting material, or blended into a matrix of hardened concrete.

A11.12.4.2. Filling the innermost receptacle with an appropriate inert gas or liquid.

A11.12.4.3. Pyrophoric Class 7 (Radioactive) materials transported by aircraft must be packaged in Type B packages.

Attachment 12

CLASS 8--CORROSIVE MATERIALS

A12.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 8 (corrosive materials). See **Attachment 3** for other details concerning Class 8 material.

A12.2. Liquid Class 8 Materials must be packaged as follows.

A12.2.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G) or plastic (1H1 or 1H2)

A12.2.2. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Barrel: wood (2C2) ***NOTE:*** _ Not authorized for PG I material.

A12.2.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Jerricans: steel (3A1 or 3A2), aluminum (3B1 or 3B2) or plastic (3H1 or 3H2)

A12.2.4. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Boxes: steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A12.2.5. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plastic (1H1 or 1H2) or fiber (1G) with liner ***NOTE:*** _ fiber (1G) with liner only authorized for PG III material.

A12.2.6. Package in barrels as follows:

Inner packaging	Outer packaging
Not required	Barrel: wood (2C1) ***NOTE:*** _ Not authorized for PG I material.

A12.2.7. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerricans: steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A12.2.8. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: Steel, aluminum, fiber, plastic, or plywood (6HA1, 6HB1, 6HG1, 6HH1, or 6HD1) ***NOTE:*** _ plywood drum not authorized for PG I material.

A12.2.9. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Boxes: steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A12.2.10. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum or fiber (6PA1, 6PB1, or 6PG1)

A12.2.11. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Boxes: steel, aluminum, wooden or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)

A12.2.12. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	solid or expanded plastic packaging (6PH1 or 6PH2)

A12.2.13. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A12.2.14. DS2. Package as described below.

A12.2.14.1. Wooden box (4C1) or fiberboard box (4G) with inside original 1.3 L (1 1/3 quart) capacity containers. Arrange in snugly fitting cells not more than 12 per box. Place full box size pads against all inside faces of the box. Maximum gross weight is 45.4 kg (100 pounds).

A12.2.14.2. Wooden box (4C1) or fiberboard box (4G) with an inside 19 L (5 gallon) metal drum. Overpack DS2 containers that are not in good condition in metal drums. Cushion the cans with a minimum of 76 mm (3 inches) of vermiculite on all sides.

A12.3. Solid Class 8 Materials must be packaged as follows:

A12.3.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G) or plastic (1H1 or 1H2)

A12.3.2. Package in barrels as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Barrel: wood (2C2)

A12.3.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Jerricans: steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A12.3.4. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Boxes: steel (4A), aluminum (4B), Natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic box (4H2)

A12.3.5. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), plastic (1H1 or 1H2) or fiber (1G) ***NOTE:*** _ Plywood (1D) is not authorized for PG I material.

A12.3.6. Package in barrels as follows:

Inner packaging	Outer packaging
Not required	Barrel: wood (2C1 or 2C2) ***NOTE:*** _ Not authorized for PG I material.

A12.3.7. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerricans: steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A12.3.8. Package in boxes as follows:

Inner packaging	Outer packaging
Not required	Boxes: steel with liner (4A), aluminum with liner (4B), steel (4A1), aluminum (4B1), natural wood sift-proof (4C2), plywood (4D), reconstituted wood (4F), natural wood (4C1), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) ***NOTE:*** _ Steel (4A1), aluminum (4B1), natural wood (4C1), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) is not authorized for PG I material.

A12.3.9. Package in bags as follows:

Inner packaging	Outer packaging
Not required	Bags: woven plastic (5H1, 5H2, or 5H3); plastic film (5H4); textile (5L1, 5L2, or 5L3); or paper, multiwall, water-resistant (5M2) ***NOTE:*** _ Not authorized for PG 1 material.

A12.3.10. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1)

A12.3.11. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Boxes: steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A12.3.12. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, plywood, or fiber (6PA1, 6PB1, 6PD1, or 6PG1)

A12.3.13. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)

A12.3.14. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	expanded or solid plastic packaging (6PH1 or 6PH2)

A12.4. Batteries, Wet, Filled with Acid; Batteries, Wet, Filled with Alkali; or Batteries, Wet, Non-spillable must be packaged as follows.

A12.4.1. The following applies.

A12.4.1.1. Completely protect against short circuit and securely cushion electric storage batteries containing electrolyte acid or alkali corrosive battery fluid within the outer container.

A12.4.1.2. Place batteries inside an acid-proof liner (not mandatory for nonspillable batteries), adequately sealed to prevent leakage in the event of a spill, within the outer container.

A12.4.1.3. Pack batteries so that the fill openings or vents, if any, are upward.

A12.4.1.4. Do not pack with other articles unless authorized by a specific packaging paragraph.

A12.4.1.5. However, batteries may be packed with portable searchlights, battery parts, or hydrometers, if properly cushioned and securely packed in a separate container.

A12.4.2. Batteries Packed without other Materials must be packaged as follows:

A12.4.2.1. Package in boxes as follows:

Inner packaging	Outer packaging
Not required	Boxes: wooden (4C1, 4C2, 4D, 4F) or fiberboard (4G) ***NOTE:*** _ Must meet PG II performance standards.

A12.4.2.2. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: plywood (1D), fiber (1G), or plastic (1H2) ***NOTE:*** _ Must meet PG II performance standards.

A12.4.2.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerrican: plastic (3H2) ***NOTE:*** _ Must meet PG II performance standards.

A12.4.2.4. Package in boxes as follows:

Inner packaging	Outer packaging
Not required	Box: solid plastic (4H2) ***NOTE:*** _ Must meet PG II performance standards.

A12.4.3. Non-Spillable Batteries. Pack in strong outer packagings. To consider a battery non-spillable, it must withstand without leakage the vibration and pressure differential tests specified in 49 CFR 173.159(d). Batteries meeting the additional requirement of Special Provision A67 are considered dry, and are not subject to any other requirements of this manual.

A12.4.4. Electrolyte, Acid, or Alkali Corrosive Battery Fluid, Packed with Storage Batteries Wet or Dry. Package as described below.

A12.4.4.1. Package in boxes as follows:

Inner packaging	Outer packaging
Glass receptacles ***NOTE:*** Not over 4.0 L (1 gallon) capacity each.	Boxes: wooden box (4C1, 4C2, 4D, 4F) ***NOTE:*** Maximum quantity is 8.0 L (2 gallons) each. Cushion and separate the inside containers from batteries by a strong solid wooden partition.

A12.4.4.2. Package in boxes as follows:

Inner packaging	Outer packaging
Plastic bottles ***NOTE:*** Not over 1 L (1 quart) capacity each.	Boxes: wooden box (4C1, 4C2, 4D, 4F) ***NOTE:*** Pack no more than 24 bottles, securely separated from storage batteries and filling kits in each package.

A12.4.4.3. Package dry storage batteries or battery charger devices in fiberboard boxes (4G) with inner receptacles containing battery fluid. Complete package must conform to PG II requirements. Pack no more than 12 inner receptacles in one outer box. Maximum authorized gross weight is 34 kg (75 pounds).

A12.4.5. Batteries Packed without other materials (Domestic Shipments Only).

The following nonspecification packagings are authorized for domestic only shipments of batteries packed without other materials:

A12.4.5.1. One to three batteries of not over 11.3 kg (25 pounds) each, packed in an outside box. Gross weight must not exceed 34 kg (75 pounds).

A12.4.5.2. A maximum of four batteries not over 7 kg (15 pounds) each may be packed in strong outside fiberboard or wooden boxes. They must be cushioned and packed to prevent short circuits. Gross weight must not be over 30 kg (65 pounds).

A12.4.5.3. A maximum of five batteries not over 4.5 kg (10 pounds) each may be packed in an outside fiberboard or wooden box. They must be securely cushioned and packed to prevent short circuits. Gross weight must not exceed 30 kg (65 pounds).

A12.4.5.4. Single batteries not over 34 kg (75 pounds) each, packed in five-sided slipcovers or in completely closed fiberboard boxes. Slipcovers and boxes must be of single or double-faced corrugated fiberboard of at least 91 kg (200 pounds) test strength. The slipcover or the fiberboard box must fit snugly and provide an inside top clearance of at least 1.3 cm (one-half inch) above battery terminals and filler caps with reinforcements in place. When assembled for shipment, the bottom edges of the slipcover may extend to the base of the battery and must not expose more than 25.4 mm (1 inch). The completed package (battery and box or slipcover) must be capable of withstanding a top-to-bottom compression test without damage to the battery terminals, cell covers, or filler caps.

A12.4.5.5. Single batteries exceeding 34 kg (75 lbs) each may be packed in completely closed fiberboard boxes. Boxes must be double-wall corrugated fiberboard of at least 181 kg (400 lbs) test, or solid fiberboard testing at least 181 kg (400 lbs). A box may have holes in its ends provided that the handholes will not materially weaken the box. Sides and ends of the box must not be less than 1.3 cm (0.5 inch); and cushioning must be excelsior pads, corrugated fiberboard, or other suitable cushioning material. Protect the bottom of the battery by a minimum of one excelsior or double-wall corrugated fiberboard pad. Protect the top of the battery by a wood frame, corrugated trays or scored sheets of corrugated fiberboard having minimum test of 91 kg (200 lbs), or other equally effective cushioning material. Ensure the top protection bears evenly on connectors and/or

edges of the battery cover to facilitate stacking of batteries. No more than one battery may be placed in one box. The maximum authorized gross weight is 91 kg (200 lbs).

A12.4.5.6. Large electric storage batteries protected against short circuit and firmly secured to skids or pallets capable of withstanding the shocks normally incident to transportation. The height of the completed unit must not be greater than 1.5 times the width of the skid or pallet. The unit must weigh not less than 136 kg (300 lbs) gross and must not fail under a superimposed weight equal to two times the weight of the unit. If the weight of the unit is greater than 907 kg (2,000 lbs), it must not fail with a superimposed weight of 1814 kg (4,000 lbs). Battery terminals must not be relied on to support any part of the superimposed weight. Each skid or pallet must be mark and labeled as required by **Attachment 14** and **Attachment 15**.

A12.5. Bombs, Smoke, Nonexplosive must be packaged as follows. Ship bombs, smoke, nonexplosive provided they are without ignition elements, bursting charges, detonating fuses, or other explosive components. Packaging must meet PG II performance standards. Package in an outer wooden box (4C1, 4C2, 4D, 4F) or plywood drum (1D).

A12.6. Chemical or First Aid Kits must be packaged as follows. This description is intended for boxes, cases, etc., containing small amounts of various hazardous materials used for medical, analytical, or testing purposes. Mark containers in accordance with **A14.4.7.** and label in accordance with **A15.4.5.**

A12.6.1. Chemical kits shipped domestically as NA 1760 are excepted from specification packaging if the following requirements are met:

A12.6.1.1. The kit may contain only corrosive liquids.

A12.6.1.2. Liquid is contained in inner receptacles of not over 177 ml (6 fluid ounces) capacity each.

A12.6.1.3. Cushion the inside containers with sufficient absorbent cushioning material to completely absorb the contents of the individual containers, and protect from damage by other materials in the kit.

A12.6.1.4. The contents of the kit must be of such a nature and packed so there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

A12.6.1.5. The kit must be a strong wooden or metal container or be packed in a strong wooden or metal container.

A12.6.2. Package chemical kits shipped domestically as NA 1760 and containing corrosive liquids in a fiberboard box (4G) with inner glass receptacles not over 1 L (1 quart) capacity each, securely cushioned and separated from other inside containers. The contents of the kit must be of such a nature and so packed that there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

A12.7. Gallium must be packaged as follows. Package gallium metal in semi-rigid plastic inside packaging of not more than a 2.5 kg (5.5 pound) net capacity each, then individually enclosed in a sealed bag of strong, leak-tight, and puncture-resistant material impervious to liquid gallium. Place the sealed bag in a wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), plastic box (4H1 or 4H2), fiber drum (1G), or steel drum (1A2) lined with a strong, leak-tight, and puncture-resistant material impervious to liquid gallium. If necessary to keep in a solid state, enclose this packaging in a strong, water-resistant outer packag-

ing that contains dry ice or other means of refrigeration. The refrigeration must be sufficient to maintain the gallium in a completely solid state during the entire anticipated time it will be in transportation to its destination. If a refrigerant is used, all packaging materials must be chemically and physically resistant to the refrigerant and must have impact resistance at the low temperatures of the refrigerant used. If dry ice is used, the outer package must permit the release of carbon dioxide gas. Packaging must meet PG I performance standards. Manufactured articles, each not containing more than 100 mg (0.0035 oz) of gallium and packaged so that the quantity per package does not exceed 1 g (0.35 oz) are not subject to any other requirements of this manual (see paragraph **1.10.3.**).

A12.8. Hydrogen Fluoride must be packaged as follows. Package hydrogen fluoride (hydrofluoric acid, anhydrous) in cylinders, DOT 3, 3A, 3AA, 3B, 3BN, 3C, 3E, 4, 4A, 25, or 38; also DOT 4B, 4BA, 4BW, or 4C, if not brazed. Filling density must not exceed 85 percent of the water weight capacity of the cylinder. In place of the periodic volumetric expansion test required, cylinders used exclusively in this manner may be given a complete external visual inspection in conformance with 49 CFR, Part 180 Subpart C at the time such periodic inspection becomes due and documented.

A12.9. Mercury (Metallic and Articles Containing Mercury) must be packaged as follows.

A12.9.1. Handling Instructions. Mercury is poisonous in liquid and vapor form and can be absorbed through the skin at room temperature. It is corrosive to aluminum and its alloys. It expands on freezing, and may crack glass containers.

A12.9.2. Packaging Requirements. Packaging must meet the PG I performance level. Pack inner containers with sufficient cushioning material to prevent breakage. Either the inner packaging or the outer packaging must have an inner liner or bags of strong leak-proof and puncture-resistant material, impervious to mercury, completely surrounding the contents and sealed which will prevent the escape of mercury from the package irrespective of its position. Manufactured articles, each containing not more than 100 mg (0.0035 oz) of mercury and packaged so that the quantity of mercury per package does not exceed 1 g (0.0035 oz) are not subject to any other requirements of this manual (see paragraph **1.10.4.**). Package mercury as follows:

A12.9.2.1. In inner earthenware, glass, or suitable plastic receptacles containing not more than 3.5 kg (7.7 lbs), glass ampoules containing not more than 0.5 kg (1.1 lbs), or iron or steel quicksilver flasks containing not more than 35 kg (77 lbs) of mercury. Package in outer wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), plastic box (4H2), steel drum (1A2), plywood drum (1D), fiber drum (1G), or steel jerrican (3A2).

A12.9.2.2. Use welded steel bottles with inner vaulted bottoms as single packagings. The closure must be a bolt with a conical thread and the opening must not exceed 20 mm (0.79 inches). The maximum authorized net quantity is 35 kg (77 pounds).

A12.9.2.3. Specification packagings are not required for manufactured articles or apparatuses containing mercury when packaged as follows:

A12.9.2.3.1. Manufactured articles or apparatus of which metallic mercury is a component part (manometers, pumps, thermometers, switches, etc.), except as otherwise covered in **A12.9.** These items must be packaged in a strong outer packaging. The inner liner and cushioning requirements of **A12.9.2.** apply.

A12.9.2.3.2. Mercury switches and relays are excepted from this manual if they are of the totally enclosed leak-proof type in sealed metal or plastic units. Thermometers, switches, and relays each containing a total quantity of not more than 15 g (0.53 ounces) of mercury, are also excepted if installed as an integral part of a machine or apparatus and so fitted that damage or leakage of mercury is unlikely to occur under conditions normally incident to transport.

A12.9.2.4. Package electrons tubes, mercury vapor tubes, and similar tubes as follows:

A12.9.2.4.1. In strong outer packagings with all seams and joints sealed with self adhesive, pressure-sensitive tape that will prevent the escape of mercury from the package. The maximum net quantity is 450 g (15.9 ounces) of mercury per package.

A12.9.2.4.2. Package tubes with more than 450 g (15.9 ounces) of mercury in strong outer packagings having sealed inner liners or bags of strong leak-proof and puncture-resistant material impervious to mercury, completely surrounding the contents which will prevent the escape of mercury from the package irrespective of its position.

A12.9.2.4.3. Tubes which do not contain more than 5 g (0.2 ounces) of mercury each and that are packed in the manufacturer's original packaging. Maximum total net quantity is 30 g (1.1 ounces) of mercury per package.

A12.9.2.4.4. Tubes which are completely jacketed in sealed leak-proof metal cases and are packed in the manufacturer's original packaging.

A12.9.2.5. Mercurial barometers complying with **A12.9.2.3.1.**, that are loaded and unloaded from an aircraft under the supervision of, and are accompanied in flight by a US weather official or a similar US agency official (for example, Air Weather Service personnel), are excepted from any other requirements of this manual.

A12.10. Nitrating Acid Mixtures; Nitrating Acid Mixtures, Spent; or Nitric Acid must be packaged as follows. Do not package nitric acid exceeding 40 percent concentration with any other material. Package nitric acid as follows:

A12.10.1. Pack nitric acid in any concentration, which does not contain sulfuric acid or hydrochloric acid as impurities, in:

A12.10.1.1. Stainless steel drum (1A1). Do not ship containers weighing less than 85 percent of their original marked weight. Stainless steel used in drums must be at least 0.9 mm (.035 inches) for 55 L (15 gallon) nominal capacity, 1.2 mm (.047 inches) for 115 L (30 gallon) nominal capacity, and 1.5 mm (.059 inches) for 210 L (55 gallon) nominal capacity. Type 304 or other grades of equivalent corrosion-resistant steel in as-welded condition are authorized for nitric acid concentrations of up to and including 78 percent. In addition to the UN specification markings, the marking as specified in 49 CFR 173.158(b)(1) must be included on the drum. An example of this marking is: 304HT/1.9/2.7/TW55. For all other concentrations of nitric acid the following are authorized:

A12.10.1.1.1. Type 304 heat-treated (quenched in water at 1040 degrees C [1900 degrees F]).

A12.10.1.1.2. Stabilized type 347 in the as-welded condition.

A12.10.1.1.3. Stabilized type 347 stress-relieved (845-900 degrees C [1550-1650 degrees F]).

A12.10.1.1.4. Stabilized type 347 heat-treated (quenched in water at 1040 degrees C [1900 degrees F]).

A12.10.1.1.5. Other grades of equivalent corrosion resistance.

A12.10.1.2. Expanded plastic box (4H1), with inner glass receptacles not over 2.5 L (0.66 gallons) capacity each. Pack no more than four glass inner receptacles in one outer packaging.

A12.10.2. Pack nitric acid of 90 percent or greater concentration in a wooden box (4C1, 4C2, 4D, or 4F), with inner glass bottles not over 2.5 L (0.66 gallons) capacity each. The inside containers must be individually overpacked and cushioned in tightly closed metal containers, then packed in the outer container.

A12.10.3. Pack nitric acid, of 80 percent or greater concentration that does not contain sulfuric acid or hydrochloric acid as impurities, in an aluminum drum (1B1). Maximum quantity is 38 L (10 gallons).

A12.10.4. Package nitric acid of less than 90 percent concentration in a wooden box (4C1, 4C2, 4D, or 4F) or fiberboard box (4G) with inside glass bottles not over 2.5 L (0.66 gallons) capacity each.

A12.10.5. Package nitric acid of more than 70 percent concentration in outer wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), steel drum (1A2), aluminum drum (1B2), plastic drum (1H2), plywood drum (1D), fiber drum (1G), or plastic jerrican (3H2) with inside containers:

A12.10.5.1. Glass or earthenware containers not over 1 L (1 quart) capacity each

A12.10.5.2. Glass ampoules not over 0.5 L (1 pint) capacity each..

A12.10.6. Pack nitric acid of 70 percent or less concentration in outer wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), steel drum (1A2), aluminum drum (1B2), plastic drum (1H2), plywood drum (1D), fiber drum (1G), or plastic jerrican (3H2) with inside containers:

A12.10.6.1. Glass or earthenware not over 2.5 L (0.66 gal) capacity each

A12.10.6.2. Plastic not over 2.5 L (0.66 gal) capacity each further individually placed into tightly closed metal packaging

A12.10.6.3. Glass ampoules not over 0.5 L(0.1 gal) capacity each

A12.10.7. Pack nitric acid of 70 percent or less concentration in composite packaging (6PA1, 6PA2, 6PB1, 6PB2, 6PC, 6PD1, 6PH1, 6PH2). Composite packaging 6HH1 and 6HA1 meeting the compatibility requirements of 49 CFR 173.24(e) are also authorized.

A12.10.8. Pack nitric acid of 70 percent or less concentration in outer plastic box (4H1) with inside glass packaging containing not more than 2.5 L (0.66 gal) each.

A12.11. Class 8 Materials With an Inhalation Hazard (Hazard Zone A and B) must be packaged as follows.

A12.11.1. Handling Instructions. These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material. (Handling instruction only required for Hazard Zone A material).

A12.11.2. Packaging Requirements.

Package Class 8 materials with an Inhalation Hazard (Hazard Zone A and B) as follows:

A12.11.2.1. In DOT cylinders as identified in 49 CFR, part 178, subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of **A3.3.2.**

A12.11.2.2. Packed in an inner drum (1A1, 1B1, 1N1, 1H1, or 6HA1), then placed in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum must not exceed 220 L (58 gallons). Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet the following requirements:

A12.11.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).

A12.11.2.2.2. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A12.11.2.2.3. Have screw-type closures that meet all the following requirements:

A12.11.2.2.3.1. Closed tightly to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A12.11.2.2.3.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A12.11.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psig).

A12.11.2.2.4. Meet the following minimum thickness requirements:

A12.11.2.2.4.1. 1A1 and 1N1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.3 mm (0.051 inches). 1B1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches).

A12.11.2.2.4.2. 1A1 and 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.7 mm (0.067 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches).

A12.11.2.3. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal securely cushioned with a nonreactive absorbent material. The package must be packed within a leak-tight packaging of metal or plastic, then packed in a steel drum (1A2), aluminum drum (1B2), metal drum other than steel or aluminum (1N2), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or

solid plastic box (4H2). The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure must have a screw-type closure, which is held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A12.11.2.4. Pack in a metal drum (1A1, 1B1, or 1N1), or plastic drum (1H1), then placed in a metal drum (1A2 or 1H2), or a plastic receptacle with outer steel drum (6HA1). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches.) The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, 1N1, or 1H1) must not exceed 220 L (58 gallons). This packaging is only authorized for Class 8, Hazard Zone B material. Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet the following requirements:

A12.11.2.4.1. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A12.11.2.4.2. Have screw-type closures that meet all the following requirements:

A12.11.2.4.2.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A12.11.2.4.2.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A12.11.2.4.2.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psig).

A12.11.2.4.3. Meet the following minimum thickness requirements:

A12.11.2.4.3.1. 1A1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 0.69 mm (0.027 inches). 1B1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 2.79 mm (0.110 inches). 1H1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.14 mm (0.045 inches). 6HA1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.70 mm (0.027 inches) for the outer steel drum.

A12.11.2.4.3.2. 1A1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.08 mm (0.043 inches). 1B1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches). 1H1 drums with a

capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.124 inches). 6HA1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.96 mm (0.038 inches) for the outer steel drum.

A12.11.2.4.3.3. 1A1 or 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.35 mm (0.053 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches). 1H1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.124 inches). 6HA1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 1.08 mm (0.043 inches) for the outer steel drum.

Attachment 13

CLASS 9--MISCELLANEOUS HAZARDOUS MATERIAL

A13.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 9 (Miscellaneous Hazardous Materials). See **Attachment 3** for other details concerning Class 9 material.

A13.2. Ammonium Nitrate Fertilizers; Benzaldehyde; Dibromodifluoromethane (Difluorodibromomethane); Environmentally Hazardous Substances, NOS; Fish Meal, Stabilized; Fish Scrap, Stabilized; Hazardous Waste, NOS; Other Regulated Substances; Polycholorinated Biphenyls (PCB); Zinc Dithionite, Zinc Hydrosulfite must be packaged as follows.

A13.2.1. Handling Instructions.

A13.2.1.1. Do not expose Dibromodifluoromethane to high temperature because, when it decomposes, toxic fumes are emitted. Store in a cool, ventilated area away from flame.

A13.2.1.2. Contains Otto Fuel II as a liquid propellant. In the event of a leak, avoid direct skin contact, ingestion, or inhalation of vapors. Vapors are toxic and may cause severe headache and nausea.

A13.2.2. Class 9 Liquids must be packaged as follows.

A13.2.2.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G), or plastic (1H1 or 1H2)

A13.2.2.2. Package in barrels as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Barrel: wooden (2C2)

A13.2.2.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A13.2.2.4. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Boxes: steel (4A1 or 4A2), aluminum (4B1 or 4B2), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)

A13.2.2.5. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2), or plastic drum (1H1 or 1H2)

A13.2.2.6. Package in barrels as follows:

Inner packaging	Outer packaging
Not required	Barrel: wooden (2C1)

A13.2.2.7. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2).

A13.2.2.8. Package in following composite package:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, fiber, or plastic (6HA1, 6HB1, 6HG1, or 6HH).

A13.2.2.9. Package in following composite package:

Inner receptacle	Outer packaging
Plastic	Boxes: steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).

A13.2.2.10. Package in following composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1).

A13.2.2.11. Package in the following composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2).

A13.2.2.12. Package in the following composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	expanded plastic packaging (6PH1 or 6PH2).

A13.2.2.13. Package in the following composite package:

Inner receptacle	Outer packaging
plastic	Drum: plywood (6HD1)

A13.2.2.14. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A13.2.2.15. Fired exercise torpedoes or rockets, with no explosive components, containing Otto fuel II. Package in original or similar container authorized in **Attachment 5**.

A13.2.3. Class 9 Solids must be packaged as follows.

A13.2.3.1. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), or metal, other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G), or plastic (1H1 or 1H2)

A13.2.3.2. Package in barrels as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Barrel: wooden (2C2)

A13.2.3.3. Package in jerricans as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2),

A13.2.3.4. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Boxes: steel (4A1 or 4A2), aluminum (4B1 or 4B2), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), or solid plastic (4H2)

A13.2.3.5. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal (other than steel or aluminum) (1N1 or 1N2), plywood (1D), plastic (1H1 or 1H2), or fiber (1G)

A13.2.3.6. Package in barrels as follows:

Inner packaging	Outer packaging
Not required	Barrel: wooden (2C1 or 2C2)

A13.2.3.7. Package in jerricans as follows:

Inner packaging	Outer packaging
Not required	Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A13.2.3.8. Package in boxes as follows:

Inner packaging	Outer packaging
Not required	Boxes: steel (4A1), steel with liner (4A2), aluminum with liner (4B2), natural wood (4C1), natural wood, sift-proof (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A13.2.3.9. Package in bags as follows:

Inner packaging	Outer packaging
Not required	Bags: bag, woven plastic (5H1, 5H2, or 5H3), plastic film (5H4), textile (5L1, 5L2, or 5L3), or paper, multiwall, water-resistant (5M2)

A13.2.3.10. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	steel, aluminum, plywood, fiber, or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1)

A13.2.3.11. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	steel, aluminum, wood, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A13.2.3.12. Package in the following composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	steel, aluminum, plywood, or fiber drum (6PA1, 6PB1, 6PD1, or 6PG1)

A13.2.3.13. Package in the following composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2)

A13.2.3.14. Package in the following composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	expanded or solid plastic packaging (6PH1 or 6PH2)

A13.2.4. PCB Transformers. Palletize and tightly seal large transformers (over 400kg [886 pounds]) with PCB to prevent leakage. Place a large sheet of polyethylene under the transformer and extend it at least one quarter of the way up its sides. Provide enough vermiculite to absorb any leakage. These type transformers are exempt from UN specification packaging requirements.

A13.3. Consumer Commodities must be packaged as follows.

A13.3.1. The following applies:

A13.3.1.1. Items must meet the definition of a consumer commodity (see **Attachment 1**).

A13.3.1.2. Items identified as cargo aircraft only (Special Provision P1 through P4) in **Table A4.1.** may not be transported as a consumer commodity.

A13.3.1.3. Use a strong outside package. UN specification packaging is not required.

A13.3.1.4. Each final completed package must not exceed 25 kg (55 lbs) for international shipment or must not exceed 30 kg (66 lbs) for domestic shipment.

A13.3.1.5. Completed packages containing breakable or brittle inner packages must be capable of withstanding a 4 ft drop on solid concrete.

A13.3.1.6. Packaging must meet general requirements of **Attachment 3**.

A13.3.2. Class 2 (Non-Toxic Aerosols). Must meet the following provisions:

A13.3.2.1. Limit Class 2 substances to inner non-refillable non-metal receptacles not exceeding 120 ml (4 Fl. oz) capacity each, or in inner non-refillable metal receptacles not exceeding 820 ml (28 Fl. oz) capacity each. Flammable aerosols must not exceed 500 ml (17 Fl. oz) capacity each). The following provisions apply to all aerosols under this paragraph:

A13.3.2.1.1. The pressure in the aerosol must not exceed 1,500 kPa at 55^{o}C (217 psi at 130^{o}F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55^{o}C (130^{o}F);

A13.3.2.1.2. If the pressure in the aerosol exceeds 970 kPa at 55^{o}C (160 psi at 130^{o} F) but does not exceed 1105 kPa at 55^{o}C (160 psi at 130^{o}F), use an inner metal IP7, IP7A, or IP7B receptacle.

A13.3.2.1.3. If the pressure in the aerosol exceeds 1,105 kPa at 55^{o}C (160 psi at 130^{o}F) but does not exceed 1245 kPA at 55 ^{o}C (180 psi at 130^{o}F), use an inner metal IP7A or IP7B receptacle.

A13.3.2.1.4. If the pressure in the aerosol exceeds 1,245 kPa at 55^{o}C (180 psi at 130^{o}F), use an inner metal IP7B receptacle. IP7B metal receptacles having a minimum burst pressure of 1,800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated above

do not apply to the pressure within the capsule. The quantity of gas contained in the capsule must be so limited that the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into an aerosol.

A13.3.2.1.5. The liquid content must not completely fill the closed receptacle at 55°C (130°F).

A13.3.2.1.6. Each aerosol exceeding 120 ml (4 Fl. oz) capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55°C (130°F) without evidence of leakage, distortion or other defect.

A13.3.2.1.7. Protect the valves by a cap or other suitable means during transport.

A13.3.2.2. For aerosols containing a biological or medical preparation that will be deteriorated by a heat test and which are non-toxic and non-flammable, packed in inner non-refillable receptacles not exceeding 575 ml (19.4 Fl. oz) capacity each, the following provisions apply:

A13.3.2.2.1. The pressure in the aerosol must not exceed 970 kPa at 55° C (140.7 psi at 130°F).

A13.3.2.2.2. The liquid contents must not completely fill the closed receptacle at 55° C (130°F).

A13.3.2.2.3. One aerosol out of each lot of 500 or less, must be heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55° C (130°F) without evidence of leakage, distortion or other defect.

A13.3.2.2.4. Protect the valves by a cap or other suitable means during transport.

A13.3.3. Class 3. The following applies to Class 3 material:

A13.3.3.1. For domestic shipment, the contents of each inner package will not exceed the following: Packing Group I, 0.5 L (0.1 gallon); Packing Group II, 1.0 L (0.3 gallon); and Packing Group III, 5.0 L (1.3 gallons).

A13.3.3.2. For international shipment, each inner package must not exceed 500 ml (17 Fl. oz).

A13.3.4. Class 4.1.

A13.3.4.1. For substances in Packing Group II, each inner package must not exceed 1.0 kg (2.2 lbs) net capacity each.

A13.3.4.2. For substances in Packing Group III, each inner package must not exceed5.0 kg (11 lbs) net capacity each.

A13.3.5. Class 5.1.

A13.3.5.1. For substances in Packing Group II, each inner package must not exceed 1.0 L (0.3 gal) net capacity for liquids or 1.0 kg (2.2 lbs) net capacity for solids.

A13.3.5.2. For substances in Packing Group III, each inner package must not exceed 5 L (1.3 gal) net capacity for liquids or 5.0 kg (11 lbs) net capacity for solids.

A13.3.6. Class 5.2. (Non-Temperature Controlled).

A13.3.6.1. For Type D, E, or F, each inner package must not exceed 125 ml (4.22 fl. oz.) net capacity for liquids or 500 g (17.64 ounces) net capacity for solids.

A13.3.6.2. For Type B or C, each inner package must not exceed 25 ml (0.845 fl. oz.) net capacity for liquids or 100 g (3.528 oz.) net capacity for solids.

A13.3.7. Class 6.1.

A13.3.7.1. For domestic shipment, the contents of each inner package will not exceed the following: Liquids in Packing Group III, each inner package must not exceed 5.0 L (1.3 gallons) net capacity each, and for solids, each inner package must not exceed 5.0 kg (11 lbs) net capacity each..

A13.3.7.2. For international shipment, each inner package must not exceed 500 ml (17 Fl. oz) net capacity for liquids and 500 g (18 oz.) net capacity for solids.

A13.3.8. Class 8.

A13.3.8.1. For substances in Packing Group II, each inner package must not exceed 1.0 L (0.3 gallon) net capacity each for liquids or 1.0 kg (2.2 lbs) net capacity for solids.

A13.3.8.2. For substances in Packing Group III, each inner package must not exceed 5.0 L (1.3 gallon) net capacity each for liquids, or 5.0 kg (11 lbs) net capacity for solids.

A13.3.9. Class 9.

A13.3.9.1. For liquids, each inner package must not exceed 5.0 L (1.3 gallon) net capacity.

A13.3.9.2. For solids, each inner package must not exceed 5.0 kg (11 lbs) net capacity.

A13.4. Vehicles must be packaged as follows. The following general requirements apply:

A13.4.1. Compliance With Technical Orders. Use service technical manuals to prepare items for shipment.

A13.4.2. Fuel Limitations. Comply with paragraph **1.8.** when determining actual fuel level requirements to meet operational needs. Each liquid vehicle fuel tank, including units rigged for airdrop or units being transported as cargo to a staging area for a subsequent airdrop, may be no more than one-half full with the following exceptions.

A13.4.2.1. When the technical manual requires draining and purging.

A13.4.2.2. When unit is susceptible to fuel spills or leakage (see paragraph **A3.3.3.8.**), unit must be drained and capped.

A13.4.2.3. When loaded on the aircraft cargo ramp, the vehicle fuel tank must be drained if the fuel tank openings cannot be located on the high side of the ramp.

A13.4.2.4. When palletized or loaded on a trailer, drain fuel tanks. Units palletized due to the aircraft's subfloor requirements may contain fuel in tank.

A13.4.2.5. When transported under the authority of **Chapter 3** of this manual, each liquid vehicle fuel tank may be no more than three-fourths full, except for units on the aircraft cargo ramp or when loaded on the aircraft with a steep angle of ascent (e.g., KC-10, KC-135). In such cases, the amount of fuel will not exceed one-half full per tank.

A13.4.2.6. Boats and other watercraft loaded on trailers or palletized will be drained to the greatest extent possible. When transported or airdropped under the authority of **Chapter 3** of this man-

ual, each integral fuel tank may be three-fourths full. Only approved portable non-bulk fuel tanks may contain fuel.

A13.4.2.7. Transport fueled helicopters and aircraft with fuel in each tank not to exceed 150 gallons or three-fourths full, whichever amount is least. Do not exceed one-half tank full for units loaded on the aircraft cargo ramp. Fuel leakage must not occur during shipment. No special venting is required other than to maintain normal aircraft ventilation during flight. Seal vents according to service technical directives. Load tanks to prevent fuel leakage when the loading configuration requires removal of external fuel tanks. When removed in this manner, the tanks are still considered a component of the aircraft or helicopter.

A13.4.2.8. When aircraft wings are removed from aircraft body, completely drain fuel tanks within wings. Purging is not required. When transported with the original aircraft body, consider all pieces as a single unit for identification on the Shipper's Declaration form.

A13.4.2.9. Unmanned aerial vehicles (UAV) prepared according to technical publications/manuals may be shipped drained but not purged. Remaining fuel levels will be as specified in the appropriate technical publication/manual.

A13.4.2.10. When loaded in a freight container, each vehicle fuel tank must be drained. The fuel tank and system must be purged if required by the item’s technical directive, or if the flash point of the fuel is less than 38 degrees C (100 degrees F). In the absence of specific draining and purging procedures:

A13.4.2.10.1. Completely drain all fuel

A13.4.2.10.2. Run engine until it stalls

A13.4.2.10.3. Allow fuel tanks and lines to remain open for 24 hours.

A13.4.2.10.4. Installed batteries must be nonspillable or non-regulated.

A13.4.2.11. Fuel servicing vehicles will have refueling system bulk tank and lines purged (for liquids with a flash point less than 38 degrees C (100 degrees F) or drained to the maximum extent possible (for liquids with a flash point at or above 38 degrees C (100 degrees F) according to technical directives (technical orders, field manuals, etc.) so that no more than 5 gallons of fuel remains in the tank/lines.

A13.4.2.12. Liquefied petroleum gas or compressed gas powered vehicles must have the gaseous fuel completely emptied from any non-DOT specification pressurized vessel (fuel tank), lines, and regulator. Ensure tanks are securely closed. Purging is not required.

A13.4.2.13. Liquefied petroleum gas or compressed gas powered vehicles containing a DOT specification cylinder as the gaseous fuel tank do not require draining. Comply with all requirements of **Attachment 6** for the material and cylinder specification. Tightly close and secure cylinder shut off valve. Lines and regulator must be completely emptied of flammable gas and vapors.

A13.4.3. Secondary Hazards. Installed components, equipment, and vehicle secondary hazards (e.g., fire extinguishers, jerricans, etc.) must be in properly configured and approved holders designed for use with the vehicle. The following applies:

A13.4.3.1. Do not remove other hazardous materials from their packaging and store in the racks or containers of vehicles or equipment unless authorized by paragraph **A5.3.**

A13.4.3.2. Batteries will be secured upright in designed holders except non-spillable batteries meeting **Table A4.2.**, Special Provision A67 as nonhazardous, may be oriented in a manner to fit designed holder. Protect the terminals of installed batteries to prevent short circuit by use of battery boxes, protective covers, taping, etc. If battery cables are disconnected, they must be secured away from terminals, and the terminals protected.

A13.4.3.3. When loaded in a freight container, remove acid or alkali batteries and package according to **A12.4.**. Do not ship packaged wet-cell batteries inside a freight container unless accessible during flight. Nonspillable and non-hazardous gel-type batteries may remain in the vehicle holder provided they remain upright and the cables are disconnected. Tape the ends of the cables/terminals to prevent short circuit..

A13.4.3.4. Engines, generators, and other equipment that are by design an approved part of an M-Series vehicle must be drained to the greatest extent possible (not to exceed 17 oz.) except the tanks may be one-half full when the vehicle is transported under the authority of **Chapter 3** of this manual. Engines and generators mounted to a vehicle, support equipment or trailer for convenience of movement or handling must always be drained to the greatest possible extent. Purging is not necessary unless required by the item's technical instructions. Use UN Specification packaging (e.g., jerricans) should be used for transport of spare fuel whenever possible.

A13.4.3.5. Prepare aircraft and helicopters for transportation according to the requirements of the respective aircraft's shipping manual. Remove all munitions and explosives, other than those installed as permanent-type aircraft equipment, according to the pertinent aircraft technical order and **A5.2.** Fasten batteries securely in the holder provided, with the terminals protected in such a manner as to prevent damage or short circuits. When batteries are removed and shipped with the aircraft, accomplish packaging and certification according to **A12.4.**

A13.4.3.6. Air-bag modules installed as a vehicle component are not subject to any other requirements of this manual.

A13.5. Internal Combustion Engines and Support Equipment must be packaged as follows. The following general requirements apply:

A13.5.1. Compliance With Technical Orders. Use service technical manuals to prepare items for shipment.

A13.5.2. Fuel Limitations. Completely drain engine-powered support equipment of fuel. Up to 500 ml (17 ounces) of fuel may be left in engine components and fuel lines provided all lines and fuel tanks are securely closed to prevent leakage of fuel. Drain and purge when required by the applicable technical manual. The following exceptions/additional restrictions apply:

A13.5.2.1. Engine-powered support equipment with large fuel systems that the shipper determines can not be drained to 500 ml (17 ounces) must be drained within the mechanical limits of the equipment to the extent no free standing liquid remains in the fuel tank, lines, or system.

A13.5.2.2. When transported under the authority of **Chapter 3** of this manual, wheeled-engine powered support equipment may contain up to one-half tank of fuel. Ship only the minimum quantity of fuel consistent with operational requirements. Ship the Hobart-86 all models with no more than one-quarter tank of fuel and load with filler neck facing forward. Ensure tanks are securely closed. Non-wheeled engine powered support equipment must be drained with no more than 500 ml (17 ounces) of residual fuel remaining.

A13.5.2.3. Completely drain single axle equipment loaded with the tongue resting on the aircraft floor. The requirements of **A13.5.2.** or **A13.5.2.1.** apply depending on the type and size of equipment.

A13.5.2.4. Engines that are damaged or inoperable and purging can not be accomplished, or proper purging facilities are unavailable must be drained to the maximum extent possible and install plugs, caps, and covers over all openings as required by technical directives.

A13.5.2.5. Engines which are drained and purged according to the responsible technical manual, and containing no other hazardous material, are nonhazardous for transportation. Comply with paragraph **1.10.4.**

A13.5.2.6. Ship the Aerial Bulk Fuel Delivery System (ABFDS) consisting of 3000 gallon bladders under the following conditions:

A13.5.2.6.1. Completely drain the bulk fuel bladders. Due to bladder construction there will be residual fuel remaining. Ensure bladders are drained as much as possible.

A13.5.2.6.2. Completely drain the pump module. No more than 500 ml (17 ounces) of fuel may be left in engine components.

A13.5.2.6.3. Securely close all vents and valves to prevent residual fuel leaks.

A13.5.2.6.4. When prepared in this manner, ABFDS may be stacked for shipment.

A13.5.2.7. Liquefied petroleum gas or compressed gas powered engines or equipment must have the gaseous fuel completely emptied from any non-DOT specification pressurized vessel (fuel tank), lines, and regulator. Ensure tanks are securely closed. Purging is not required.

A13.5.2.8. When loaded in a freight container, fuel tanks must be drained. The fuel tank and system must be purged if required by the item's technical directive, or if the flash point of the fuel is less than 38 degrees C (100 degrees F). In the absence of specific draining and purging procedures:

A13.5.2.8.1. Completely drain all fuel

A13.5.2.8.2. Run engine until it stalls

A13.5.2.8.3. Allow fuel tanks and lines to remain open for 24 hours.

A13.5.2.8.4. Installed batteries must be nonspillable or non-regulated.

A13.5.2.9. When unit is susceptible to fuel spills or leakage (see paragraph **A3.3.3.8.**), unit must be drained and capped.

A13.5.3. Secondary Hazards. Installed components, equipment, and secondary hazards (e.g., fire extinguishers, jerricans, etc.) must be in properly configured and approved holders designed for use with the unit. The following applies:

A13.5.3.1. Batteries will be secured upright in designed holders except non-spillable batteries meeting **Table A4.2.**, Special Provision A67 as nonhazardous, may be oriented in a manner to fit designed holder. Protect the terminals of installed batteries to prevent short circuit by use of battery boxes, protective covers, taping, etc. If battery cables are disconnected, they must be secured away from terminals, and the terminals protected.

A13.5.3.2. When loaded in a freight container, remove acid or alkali batteries and package according to **A12.4.**. Do not ship packaged wet-cell batteries inside a freight container unless accessible during flight. Nonspillable and non-hazardous gel-type batteries may remain in the equipment holder provided they remain upright and the cables are disconnected. Tape the ends of the cables/terminals to prevent short circuit.

A13.6. Battery Powered Equipment and Vehicles must be packaged as follows. Prepare items powered by wet cell or non-spillable batteries (includes items with batteries as an installed integral component e.g., tactical shelters, trailers, etc) as follows:

A13.6.1. Use service technical manuals to prepare items for shipment.

A13.6.2. Securely fasten battery in an upright position so that battery fluid will not leak. Remove the battery and ship according to **A12.4.** if the item is likely to be shipped in other than an upright position.

A13.6.3. Protect installed batteries to prevent short circuit. To secure the battery from short circuit, completely protect the terminal posts from contact (i.e., tape, rubber boots, etc.). When prepared in this manner, it is not required to disconnect the battery or remove it from the equipment.

A13.6.4. Securely fasten original installed equipment in properly configured and approved holders. Do not remove other hazardous materials from their packaging and store in the racks or containers of vehicles or equipment.

A13.6.5. Wheelchairs equipped with non-spillable batteries must have the batteries protected against short circuits and securely attached to the wheelchair or removed and boxed. Specification packaging is not required.

A13.6.6. Wheelchairs equipped with spillable batteries for carriage on aircraft in cargo compartments that can accommodate upright loading and storage of the wheelchairs must be secured in an upright position in the cargo compartment. Batteries must remain installed and be securely attached to the chair. Protect the terminals against short circuits. Wheelchairs must be deactivated by removing connections at battery terminals or by otherwise disconnecting their power source. Remove the battery and ship according to **A12.4.** if the item is likely to be shipped in other than an upright position.

A13.7. Lithium Batteries and Cells.

A13.7.1. The following requirements apply:

A13.7.1.1. Do not transport damaged batteries or those suspected of damage.

A13.7.1.2. Each cell or battery is of the type proven to meet the lithium battery requirements in the UN Manual Tests and Criteria. A cell or battery and equipment containing a cell or battery of a design type which was first transported prior to January 1, 2006 and is of a type proven to meet the criteria of Class 9 by testing in accordance with the tests in the UN manual of Tests and Criteria, Third Revised Edition, 1999 is not required to be retested.

A13.7.1.3. Each cell and battery must be equipped with an effective means of preventing external short circuit by either using inner packagings, dividers or other suitable means. Completely protect against short circuit and secure within the outer packaging or article.

A13.7.1.4. Each cell and battery must incorporate a safety venting device or be designed in such a manner that will preclude a violent rupture under any condition incident to transportation, such as a dead short. Batteries containing cells or series of cells connected in parallel must be equipped with diodes or fuses to prevent reverse current flow.

A13.7.1.5. Cells and batteries must meet test requirements prescribed in 49 CFR 173.185(e)(6). Army-procured lithium batteries are manufactured according to MIL-PRF-49471 and meet the test requirements. These batteries are identified by the following battery numbers: BA-5093/U, BA-5112/U, BA-5372/U, BA-5513/U, BA-5557/U, BA-5567/U, BA-5588/U, BA-5590/U, BA-5598/U, BA-5599/U, BA-5600/U, BA-5800/U, BA-5847/U, BA-6598/U.

A13.7.1.6. Cells or batteries with liquid cathodes containing sulfur dioxide, sulfuryl chloride or thionyl chloride may not be offered for transportation or transported if any cell has been discharged to the extent that the open circuit voltage is less than two volts or is less than two-thirds of the voltage of the fully charged cell, whichever is less except according to **A13.7.2.2.**

A13.7.2. Package as follows:

A13.7.2.1. New Batteries. Package cells and batteries in strong inner packages meeting the requirements of the UN Manual Test and Criteria. Pack inner packaging inside an outer metal box (4A or 4B), wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), or solid plastic box (4H2), fiber drum (1G), metal drum (1A2 or 1B2), plywood drum (1D), plastic drum (1H2), plastic jerrican (3H2), or metal jerrican (3A2 or 3B2). Packaging must meet PG II performance level. UN Specification packaging is not required when individual spare batteries are hand-carried according to **Chapter 3** of this manual.

A13.7.2.2. Used Batteries.

A13.7.2.2.1. Air movement of used liquid cathode lithium batteries from forward combat or exercise area is authorized if it is the only mode available. Individually wrap batteries in non-conductive material and place in a strong outer container with at least one-inch of inert material surrounding each battery.

A13.7.2.2.2. Rechargeable lithium ion or lithium polymer and solid cathode batteries may be shipped in a discharged/used (low voltage) state when packaged according to **A13.7.2.1.** or **A13.7.2.2.1.** from forward combat or exercise area without regard to voltage.

A13.8. Lithium Batteries Contained in Equipment.

A13.8.1. UN specification packaging is not required. Pack equipment with installed lithium batteries in a strong waterproof outer packaging or in an outer packaging made waterproof through the use of a liner (unless the equipment is made waterproof by nature of its construction). Secure the equipment within the outer packaging to prevent movement, short circuit, or accidental operation during transport.

A13.8.2. For airdrop missions authorized according to **Chapter 3** of this manual , pack electronic equipment handcarried in a rucksack, in a shipping (airdrop) container, or as a door bundle depending on mission requirements. Shipper’s Declaration for Dangerous Goods certification is not required.

A13.9. Lithium Batteries Packed With Equipment.

A13.9.1. Cells and batteries packed with equipment must be packed as identified in paragraph **A13.7.2.** Secure to prevent movement and short circuits. Do not pack more than 5 kg of cells or batteries with each item of equipment. Except as identified in **A13.9.2.**, equipment and accompanying lithium batteries must be packaged in a strong outer container.

A13.9.2. For missions authorized according to **Chapter 3** of this manual , electronic equipment may be handcarried in a rucksack, packed in a shipping (airdrop) container, or in a door bundle depending on mission requirements. Shipper's Declaration for Dangerous Goods certification is not required.

A13.10. Carbon Dioxide, Solid (Dry Ice) must be packaged as follows.

A13.10.1. Handling Instructions. Dry ice is extremely cold and will damage human tissue on contact. Store only in well ventilated areas. Never store in hermetically or tightly sealed containers. To minimize carbon dioxide concentration within the aircraft during ground operations, open the cargo/access doors and emergency escape hatches for maximum ventilation.

A13.10.2. Packaging Requirements.

A13.10.2.1. Wrap in kraft paper, secure with tape, and pack in fiberboard boxes, polystyrene foam containers or other suitable packaging designed and constructed to permit the release of carbon dioxide gas and to prevent a build-up of pressure that could rupture the packaging. UN specification packaging is not required.

A13.10.2.2. Prepare DOD medical shipments requiring use of dry ice according to DLAR 4145.21/TB MED 284/NAVSUPINST 4610.31A/AFJI 41-208, *Preparation of Medical Material Requiring Freeze or Chill Environment for Shipment.*

A13.10.2.3. Prepare non-hazardous shipments requiring dry ice according to technical directives or industry standards. Outer packaging must be fiberboard boxes, polystyrene foam containers, or other suitable packaging designed and constructed to permit the release of carbon dioxide gas and to prevent build-up of pressure that could rupture the packaging. UN specification packaging is not required.

A13.11. Magnetized Material must be packaged as follows.

A13.11.1. Handling Instructions. Do not store magnetic materials suitable for military airlift closer than 4.6 m (15 feet) to compass sensing devices or other devices unduly affected by magnetic fields.

A13.11.2. Packaging Requirements. Shield magnetic materials when required to reduce magnetic field strength to not greater than 5.25 milligauss or two degrees deviation of a magnetic compass at a distance of 15 feet (4.6 m). Ensure that meters used to measure the magnetic field are properly operational, and whenever possible, that the item be measured by two different devices. Provide blocking and bracing as required. Additional packaging details are included in TO 00-25-251. Package magnetic tubes individually in compliance with MIL-E-75. Package magnetically susceptible items to make sure that the distance between the magnetic surface and outside of the innermost container is no less than the protective distance required, and in no instance less than 102 mm (4 inches). UN specification packaging is not required. Magnetic material that has a magnetic field strength greater than 0.00525 gauss at 4.6m (15 feet) is forbidden for air movement.

A13.12. Life-Saving Appliances must be packaged as follows. Life-saving appliances, self-inflating or nonself-inflating, include (but are not limited to) life raft kits, life vest kits, survival kit assemblies, ejection seats, non-ejection seats, and parachutes that contain small quantities of hazardous material that are required as part of the survival equipment. Kit contents may include, but are not limited to, flammable items (fire starter and matches), ammunition items (cartridges and shells), pyrotechnics (signal flares), and nonflammable compressed gas cylinders (carbon dioxide and breathing oxygen).

A13.12.1. Handling Instructions. Store in cool, well-ventilated areas away from fire hazards and sources of heat or ignition. Do not drop or rough handle.

A13.12.2. Packaging Requirements:

A13.12.2.1. Pack kits in weather-resistant fiberboard or other securely closed strong outer container. Pack hazardous materials contained in the kit in inner packaging that is adequate to prevent accidental activation. Suitably cushion the inner packagings to prevent movement. Packagings must meet the general requirements of **A3.1.** UN specification packaging is not required.

A13.12.2.2. Individually assigned kit hand carried by a crewmember. This paragraph applies only to support operations involving recovery of inoperable aircraft or return of a flight crewmember as a passenger to maintain accountability of an individually assigned kit. For unit deployments see paragraph **3.5.** or transport as palletized cargo according to **A13.12.2.1.** This does not apply to contract passenger or commercial aircraft. The following applies.

A13.12.2.2.1. Package life-saving appliances in a strong outer container or A-3 bag. The requirements of **A13.12.2.1.** for inner packing and cushioning apply.

A13.12.2.2.2. Individual assigned kits may be handcarried by crew members. Crew members must inform the Air Terminal Operations Center, when transporting life-saving appliances in this manner. Items will be stored as directed by the transporting aircraft commander.

A13.12.2.2.3. When prepared and handcarried according to this paragraph, no other requirements of this manual apply while in kit is in possession of the crewmember.

A13.13. Dangerous Goods in Apparatus or Machinery must be packaged as follows. Apply this description only to apparatus or machinery containing hazardous material as an integral component of the item. This description may also be used for items that are normally a part of an end item or required to serve an operational function, but are removed and shipped separately (i.e., fuel tanks or bladders). Do not use this description for items in which a PSN already exists in **Table A4.1.** The following applies.

A13.13.1. Apparatus or machinery may only contain hazardous materials permitted as limited quantities under **A19.3.**

A13.13.2. If more than one hazardous material is present, the material must not be capable of reacting dangerously together.

A13.13.3. The total net quantity of hazardous materials contained in one package must not exceed the following:

A13.13.3.1. 1 kg (2.2 lbs) for solids

A13.13.3.2. 500 ml (17 ounces) for liquids

A13.13.3.3. 0.5 kg (1.1 lbs) for Class 2.2 gases

A13.13.4. Secure or cushion receptacles containing hazardous material to prevent breakage or leakage and to control movement within the item during transport. Cushioning material must not react dangerously with or have protective properties adversely affected by any leakage.

A13.13.5. Ensure that, in the event of damage to receptacles, no leakage of the hazardous material from the apparatus or machinery is possible. A leak-proof liner is required for articles that are completed drained of liquid but not purged. All openings and lines must be capped or sealed according to applicable technical directives.

A13.13.6. Class 2.2 gases must be in authorized cylinders according to **Attachment 6**.

A13.13.7. Pack in strong outer packagings unless the receptacles containing the hazardous material are adequately protected by the construction of the apparatus or machinery. UN specification packaging is not required.

A13.14. Class 9 Materials must be packaged as follows. UN specification packaging is not required for material packaged according to this paragraph.. Use any appropriate non-bulk packaging that meets the requirements of **Attachment 3** to ship liquid or solid material. The following applies.

A13.14.1. Provide enough outage for packagings of 208 L (55 gallon) capacity or less, so that the packaging will not be liquid full at 54 degrees C (130 degrees F).

A13.14.2. Make sure that when a liquid or solid has an absolute vapor pressure over 110 kPa (16 psi) at 38 degrees C (100 degrees F) the primary packaging is capable of withstanding the inside vapor pressure at 54 degrees C (130 degrees F) without leakage.

A13.14.3. Package material that may cause a hazard in transportation due to its reaction with water in either an inner or outer waterproof packaging.

A13.15. Air Bag Inflators, Air Bag Modules, and Seat-Belt Pretensioners must be packaged as follows. Item classification as Class 9 must be approved by DOT according to 49 CFR 173.166. Package in boxes, drums, or jerricans as follows:

Inner packaging	Outer packaging
Not required	Boxes: fiberboard (4G), wooden (4C1 or 4C2), reconstituted wood (4F), or solid plastic (4H2) *or* Drums: steel (1A2), aluminum (1B2), fiber (1G), or plastic (1H2) *or* Jerricans: steel (3A2) or plastic (3H2)

A13.16. Asbestos (Hydrated Mineral Silicates) must be packaged as follows. Asbestos blue, brown, or white, includes any of the following hydrated mineral silicates: chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, actinolite asbestos, and every product containing any of these materials. Asbestos that is immersed or fixed in a natural or artificial binder material (such as cement, plastic, asphalt, resins, or mineral ore) and manufactured products containing asbestos are not subject to this para-

graph. Asbestos must be loaded, handled, unloaded, and any contamination of aircraft removed in such a manner that will minimize occupational exposure to airborne particles released incident to transportation. Packaging must meet the general packaging requirements of **A3.1.** UN specification packaging is not required. Package asbestos in:

A13.16.1. Rigid, leak tight packaging such as metal, plastic, or fiber drums.

A13.16.2. Bags or other nonrigid packaging that are dust and sift-proof. The packages must be palletized and unitized by methods such as shrink-wrapping in plastic or wrapping in fiberboard secured by strapping.

A13.16.3. Bags or other nonrigid packaging that are dust and sift-proof in strong outside fiberboard or wooden boxes.

A13.17. Polymeric Beads, Expandable and Plastic Molding Compound must be packaged as follows. Pack polymeric beads or granules, expandable, evolving flammable vapor and plastic molding compound in dough, sheet or extruded rope form, evolving flammable vapor in boxes or drums as follows:

Inner packaging	Outer packaging
Sealed plastic liner	Boxes: wood (4C1 or 4C2), plywood (4D), fiberboard (4G), or reconstituted wood (4F) *or* Drums: plywood (1D) or fiber (1G) ***NOTE:*** _ Vapor tight metal or plastic drums (1A1, 1A2, 1B1, 1B2, 1H1 or 1H2) may also be used (without liner).

A13.18. Chemical or First Aid Kits must be packaged as follows.

A13.18.1. This description is intended for boxes, cases, etc., containing small amounts of various hazardous materials used for medical, analytical, or testing purposes.

A13.18.1.1. The PG assigned to the kit as a whole must be the most stringent PG assigned to any individual substance in the kit.

A13.18.1.2. The contents of the kit must be of such a nature and so packed that there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

A13.18.1.3. The only hazardous materials authorized in the kits are substances authorized as limited quantities according to **A19.3.2.**, and excepted quantities according to **A19.2.**, provided the inner packaging requirements of **A19.2.3.** are met.

A13.18.2. Package as follows:

A13.18.2.1. In inner receptacles of no more than 250 mL (8.5 fluid ounces) for liquids or 250 g (9 ounces) for solids.

A13.18.2.2. The total quantity of hazardous material in any one kit must not exceed 1 L (1 quart) for liquids or 1 kg (2.2 pounds) for solids.

A13.18.2.3. Protect inner receptacles from other materials in the kit and pack in wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), expanded plastic (4H1), solid plastic (4H2), fiberboard (4G), steel (4A), or aluminum (4B) box.

A13.18.3. Refer to **Table A19.2.**, Note 1 for limited quantities of hazardous material in Chemical or First Aid Kits.

A13.19. Polystyrene Beads, Expandable, Evolving Flammable Vapors must be packaged as follows. Pack polystyrene beads or granules, expandable, evolving flammable vapor and plastic molding compound in dough, sheet or extruded rope form, evolving flammable vapor in boxes or drums as follows:

Inner packaging	Outer packaging
Sealed plastic liner	Boxes: wood (4C1 or 4C2), plywood (4D), fiberboard (4G), or reconstituted wood (4F) *or* Drums: plywood (1D) or fiber (1G) ***NOTE:*** _ Vapor tight metal or plastic drums (1A1, 1A2, 1B1, 1B2, 1H1 or 1H2) may also be used (without liner).

A13.20. Chemically Contaminated Cargo must be packaged as follows. Handle carefully, wear protective equipment when necessary. Contamination could include nerve, blister, or blood chemical agents. Take precautions (protective clothing and breathing apparatus) when handling or opening contaminated containers and working on contaminated items. Open containers in a controlled, protected, and well-ventilated area. Package contaminated items in a hermetically sealed barrier bag, placed in an open head metal drum (1A2) with an air-tight gasket. In the absence of a hermetically sealed barrier bag, wrap and place the contaminated material in an open head metal drum with an air-tight gasket then overpack into an open head metal drum (1A2) with an air-tight gasket. The outer drum must meet PG I requirements.

Attachment 14

MARKING HAZARDOUS MATERIALS

A14.1. General Requirements.

A14.1.1. Mark hazardous materials according to MIL-STD-129 and this manual.

A14.1.2. Labels may be used to meet marking requirements to the extent they meet all application, placement, size, legibility, and durability requirements for marking.

A14.1.3. To the greatest extent possible, place packages on aircraft pallets (e.g., 463L) and within vehicles/trailers so that markings required by this attachment and labels required by **Attachment 15** are visible.

A14.1.4. When an aircraft pallet or vehicle/trailer contains like items, at least one package must have required markings/labels visible. When placement on an aircraft pallet, on a vehicle/trailer or within a freight container prevents marking and labeling to be visible, use a marking board according to **A14.3.14.**

A14.1.5. Use a marking board according to **A14.3.14.** to identify unpackaged large and robust Class 1 articles which are marked with a Proper Shipping Name authorized prior to 1 January 1990.

A14.2. United Nations (UN) Packaging Specification Markings. UN specification markings are mandatory for all packages of hazardous materials unless exempted by paragraph **1.7.** or a separate approval. A description of the codes and sequence of information contained in the UN specification marking is identified in **Figure A14.1.** A sample of how the UN specification markings look is in **Figure A14.2.** and **Figure A14.3.**

Figure A14.1. UN Specification Marking Codes and Sequence of Instruction.

u **n**	The symbol used to certify that the packaging complies with United Nations recommendations. For embossed metal packagings the capital "UN" can be applied as the symbol.
4G	This is a two to four position code. The first position indicates the type of packaging and will be one of the following numbers: 1 = Drum 2 = Wooden barrel 3 = Jerrican 4 = Box 5 = Bag 6 = Composite packaging 7 = Pressure receptacle The second position indicates the type of material that the container is made of. For composite packagings, two capital letters (second and third positions) will be used to indicate the type of materials. The first letter indicates the material of the inner receptacle and the second letter indicates the material of the outer packaging. For combination packagings, only the code for the outer packaging will be used. The following letters indicate the type of materials: A = Steel (all types and surface treatments) B = Aluminum C = Natural wood D = Plywood F = Reconstituted wood G = Fiberboard H = Plastic materials L = Textile M = Paper, multi-wall
	N = Metal (other than steel or aluminum) P = Glass, porcelain, or stoneware
	The third position (fourth position for composite packagings) will be a number indicating the category of packaging within the same type (i.e., 1A1 [non-removable head steel drum], 1A2 [removable head steel drum], 6HG1 [plastic receptacle with outer fiber drum] 6HG2 [plastic receptacle with outer fiberboard box]). NOTE: 4A1, 4A2, 4B1, and 4B2 are obsolete UN codes, but may continue to appear as part of the markings.

	The following special codes may follow the packaging type code:
V	Special packaging meeting the tests specified in 49 CFR 178.601(g)(2).
W	Packaging of the same type as specified by the UN requirements, but not meeting the same general construction requirements. The transport of such packagings is subject to written approval from the competent authority. For approval see 49 CFR 178.601(h).
X1.4 or X15	Identified first is the PG the configuration has been successfully tested too. X is used for PG I. Y is used for PG II. Z is used for PG III. Items of a lesser (less hazardous) PG may be packaged in a packaging that has been tested to a higher PG provided the requirements of the test report are complied with. For single packagings, the relative density, rounded off to the first decimal will follow the PG, for which the container has been tested. This may be omitted when the relative density does not exceed 1.2. For packagings intended to contain solids or inner packagings, the PG will be followed by the maximum gross weight, in kilograms, that the packaging configuration has been tested.
100 or S	For single packagings intended to contain liquids, the next marking indicates the maximum test pressure, in kPa, rounded down to the nearest 10 kPa which the container was tested (hydraulic test). For packagings intended to contain solids or inner packagings, use the letter "S." For air shipment of packagings intended to contain inner packagings, see **A3.2.1.** Also, if the inner packaging is plastic ensure the requirements of **A3.1.2.** are met.
	The last two digits of the year during which the packaging was manufactured. Packagings of types 1H1, 1H2, 3H1, and 3H2 must also be marked with the month of manufacture. The month of manufacture may be marked on the packaging in a different place than the UN specification packaging marking.
	The country authorizing the allocation of the mark.
***	The symbol of the party responsible for ensuring that the UN requirements have been met. The symbol must be registered with the US DOT, Office of Hazardous Materials Transportation. In place of a symbol, the in-the-clear name of the party responsible for ensuring the UN requirements have been met can be used. The Department of Defense uses the symbol "DOD."

	Reconditioned packagings must be marked to indicate they have been properly reconditioned. This marking must be applied near the initial marking and must replace the country and symbol of the party responsible for ensuring the UN requirements have been met, or be in addition to the initial marking. After reconditioning a packaging, the reconditioner must apply the following markings in sequence:
USA	The country in which the reconditioning was conducted.
***	The name or registered symbol of the reconditioner.
93	The year the packaging was reconditioned.
R	Enter the letter "R."
L	Enter the letter "L" for every packaging successfully passing the leakproofness test.

Figure A14.2. Sample of UN Non-bulk Specification Packaging Marking for Solids.

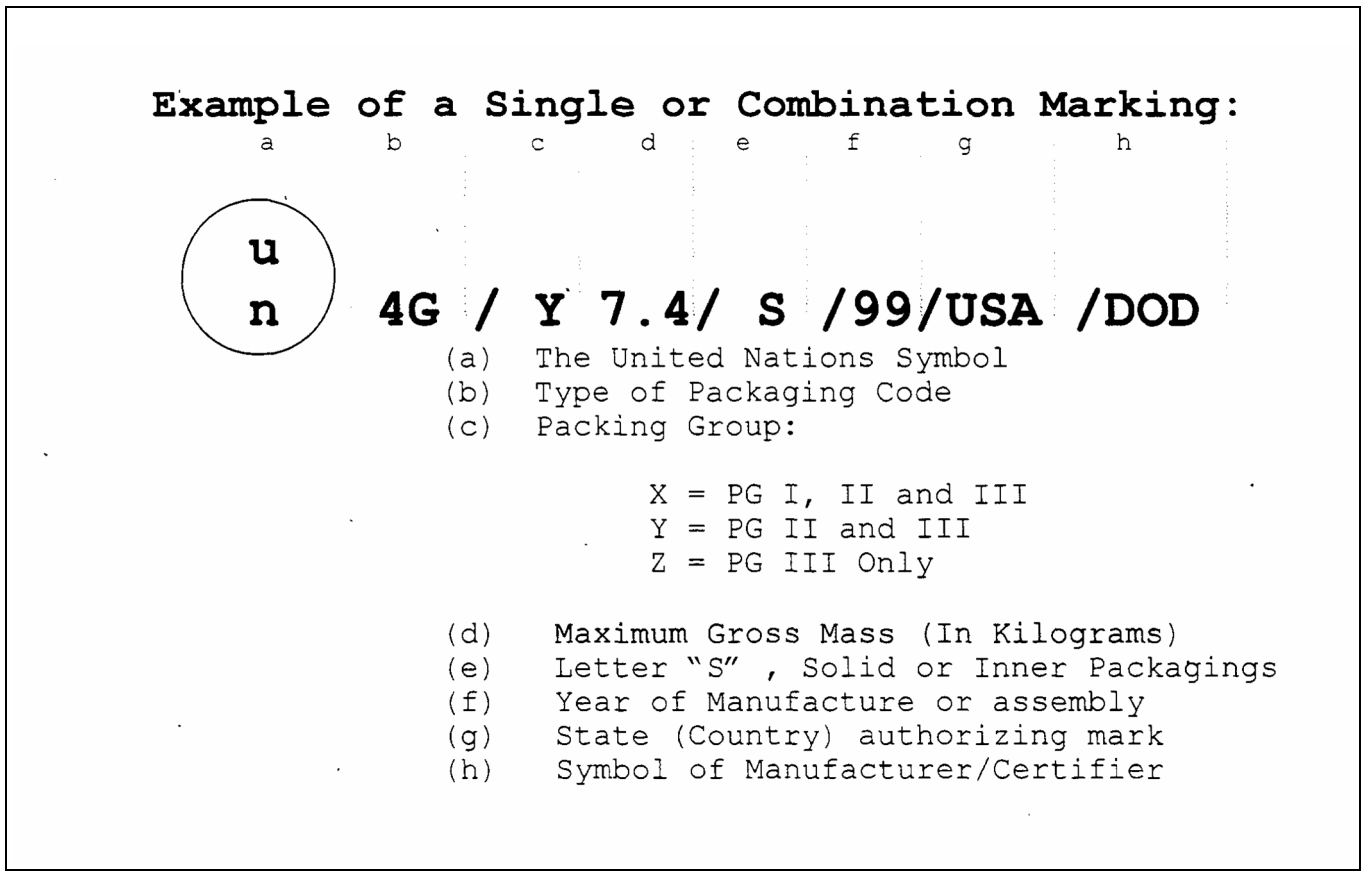
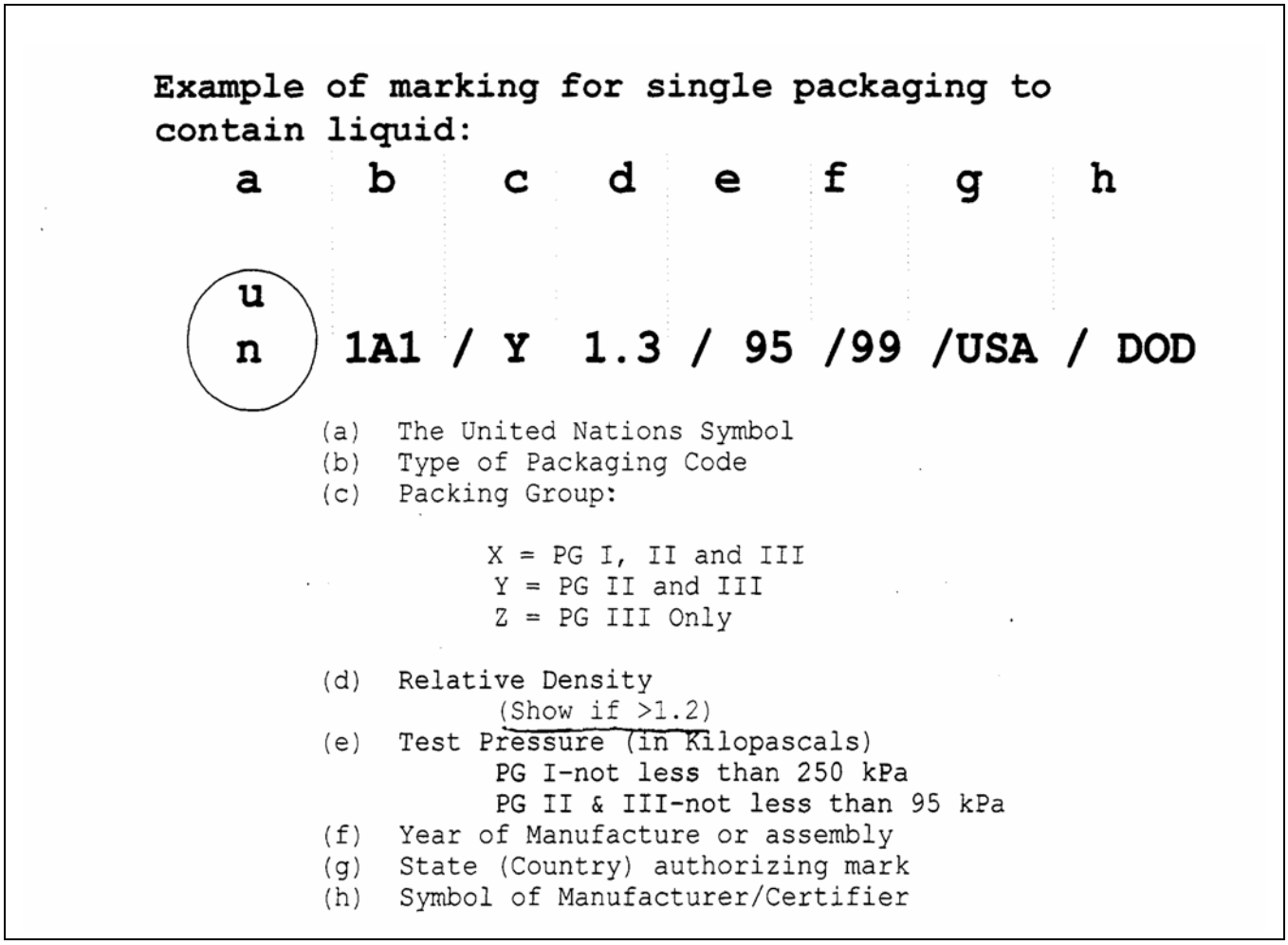


Figure A14.3. Sample of UN Non-bulk Specification Packaging Marking for Liquids.



A14.3. General Hazard Communication and Handling Markings.

A14.3.1. Proper Shipping Name and Identification Number. Unless otherwise specified, mark all packages, including overpacks, containing hazardous materials with the PSN and identification number shown in the alphabetical listing of items in **Table A4.1.**

A14.3.1.1. Mark the appropriate technical name in parenthesis following the proper shipping name when required by **A4.2.3.**

A14.3.1.2. Italicized descriptive words (see **A4.2.3.**) used as part of the PSN are optional.

A14.3.1.3. Secondary hazards do not require marking.

A14.3.1.4. Do not use abbreviations (except "w" (with), "w/o" (without), and "ORM" [other regulated material]).

A14.3.2. Hazardous Substance. Mark all packages containing a hazardous substance with the letters "RQ" in association with the PSN. If the PSN does not identify the hazardous substance by name, mark one of the following descriptions on the package, in parentheses, in association with the PSN:

A14.3.2.1. The technical name of the hazardous substance.

A14.3.2.2. The waste stream number.

A14.3.2.3. The letters "EPA" followed by the word "ignitability," "corrosivity," "reactivity," or "EP toxicity," as appropriate, or the corresponding "D" number, as appropriate.

A14.3.3. Hazardous Waste. Mark hazardous waste shipments according to this manual, 49 CFR 172, 40 CFR 262.32, and MIL-STD-129.

A14.3.4. Inhalation Hazard. Mark each package containing any material that is poisonous by inhalation "Inhalation Hazard." The marking is not required if the words “INHALATION HAZARD” appear on the label.

A14.3.5. Permits, CAAs, and COEs. Mark each package authorized by a DOT Special Permits, or a COE with permit or COE number. CAAs must be marked with the approval number in association with the PSN and ID number, if required by the CAA. A package marked with a DOT Exemption number (e.g., “DOT E-4368”) is authorized in place of a Special Permit number provided use is allowed by the accompanying Special Permit document required by paragraph **2.4.**

A14.3.6. Air Eligible Marking.

A14.3.6.1. Mark the outer container of a combination package containing liquid hazardous material "Air Eligible" to verify the inner containers meet internal pressure requirements of **A3.2.1.**

A14.3.6.2. Mark "Air Eligible" on outer containers used to meet pressure requirements of **A3.2.3.**, if air eligibility is not already identified by the POP marking.

A14.3.6.3. Mark “Air Eligible” on overpacks of one or more air eligible packages (see paragraph **1.13.**).

A14.3.6.4. Commercial marking/labeling to indicate air eligibility (e.g., “AIR APPROVED”, “AIR AUTHORIZED”, etc.) of combination packages may be used in lieu of above wording, provided package also meets all other air eligibility requirements of this manual (e.g., pressure requirements, absorbent material, etc.).

A14.3.7. Orientation Marking (This Side Up).

Pack inside containers used to ship liquid hazardous material within a combination packaging or overpack with filling holes up.

A14.3.7.1. Mark with orientation arrows meeting the requirements of 49 CFR 172.312 on two opposite sides of the package or overpack and ensure the arrows point in the correct upright direction. Orientation labels may be used to meet this marking requirement. The lettering "THIS SIDE UP", "THIS END UP" or "UP" may be used in conjunction with orientation labels.

A14.3.7.2. This requirement does not apply to materials in inside metal cans of the nonrefillable type with spun-in head and base without replaceable caps or other closing device, liquids contained in manufactured articles which are leak-tight in all orientations, and packages with hermetically-sealed inner packagings.

A14.3.7.3. Orientation Markings are not required for single packaging when package orientation is obvious (e.g., drums, barrels, etc) or on freight containers.

A14.3.8. When an overpack (generally wooden or fiberboard) is used to consolidate one or more air eligible packages to form a single unit for convenience of handling or storage during transportation, apply markings required by this manual for individual containers, with the exception of UN specification markings. Also, mark "OVERPACK" on the outer container.

A14.3.9. Freight Containers. Freight containers do not require PSN and UN numbers of the contents. However, they must be accessible (see paragraph **1.14.**) and be labeled to indicate the hazard class/division of the contents, and if the contents are cargo aircraft only in accordance with **Attachment 15**. A marking board may be used in lieu of applying markings directly to the freight container. (see **A14.3.14.**).

A14.3.10. Chemically Contaminated Cargo. Mark chemically contaminated cargo shipped under the authority of paragraph **3.7.** with the words, "Contaminated - Do Not Open." Apply by any means that is visible and legible.

A14.3.11. Dangerous Goods in Machinery or Apparatus. For items shipped under the PSN "Dangerous Goods in Machinery" or "Dangerous Goods in Apparatus" mark the PSN and UN number on the machinery, apparatus, or packaging (unless exempted by **A14.4.8.**).

A14.3.12. Unitized Cargo. Identical hazardous materials unitized on a warehouse pallet or skid must have at least one package with the UN specification markings exposed on the outside of the unit load (unless exempt by paragraph **1.7.**).

A14.3.13. Shrink Wrap Packages. When stretch or shrink wrap film is used to secure a warehouse pallet or skid, ensure proper shipping name, identification number, and UN specification markings (if applicable) are visible. Use pressure-sensitive labels or a marking board (see paragraph **A14.3.14.**) to identify contents if proper shipping name and identification number markings are not visible on one or more packages. If UN specification markings are not visible on at least one of like packages, comply with **A14.3.8.**

A14.3.14. Marking Boards. Marking boards (wood, fiberboard, tags, etc.) may only be used in lieu of individual package markings required by this attachment and labels required by **Attachment 15** for items on warehouse pallets/skids prepared according to Service approved unit load drawings under both the following conditions.

A14.3.14.1. When it is determined to be impractical or uneconomical to mark/remark each package on a pallet or skid.

A14.3.14.2. The entire pallet/skid will not be broken down at any time during transportation until delivery to the customer.

A14.4. Marking Requirements Applicable to Class.

A14.4.1. Class 1.

A14.4.1.1. Containers packaged before January 1, 1990 may be shipped both domestically and internationally by military air without the UN specification markings according to paragraph **1.7.2.** Comply with all other marking requirements of this attachment. Ensure packages requiring a DOT or military/federal specification number specified by packaging paragraph in **Attachment 27** are properly marked.

A14.4.1.2. Mark packages of explosives with an EX number or National Stock Number (as listed in the Joint Hazard Classification System) for each explosive. This does not apply if the explosive has an interim hazard classification issued according to **A3.3.1.4.** The EX number is an explosive classification approval number, it is not the same as a DOT-SP number.

A14.4.1.3. Mark "THIS SIDE UP" on the top of packages of explosives containing liquids.

A14.4.1.4. When explosives are installed according to **A5.2.**, mark the following statement near each explosive device: "WARNING - EXPLOSIVE DEVICE EMBEDDED IN ***" (*** identifies location of device; i.e., window, door, frame, etc).

A14.4.1.5. Explosives authorized by this manual to be shipped unpacked, must display the PSN and UN number. That marking may be on the item, its cradle, or handling, storage, or launching device. This marking is not required for items hand-carried (see paragraph **3.5.**), unpackaged for airdrop (see **A5.3.1.**), or secured in a tactical vehicle or equipment (see **A5.3.2.**).

A14.4.1.6. For Grandfathered shipments, mark packages with DOT or military/federal specification number when specified by packaging paragraph in **Attachment 27**.

A14.4.2. Class 2.

A14.4.2.1. For ethylene oxide prepared and certified according to **A6.13.4.**, mark the top head of the drum "THIS END UP."

A14.4.2.2. Mark fire extinguishers prepared and certified according to **A6.7.3.** to indicate year of test and "MEETS DOT REQUIREMENTS." The words "This extinguisher meets all requirements of 49 CFR 173.306" may be displayed in place of "MEETS DOT REQUIREMENTS" on extinguishers manufactured before January 1, 1976.

A14.4.2.3. Each outer packaging of cryogenic liquids prepared and certified according to **A6.11.** must have arrows to indicate upright position and must be marked "KEEP UPRIGHT" and "DO NOT DROP." Hydrogen, cryogenic liquid must meet the marking requirements in 49 CFR 178.57. The total rate of venting in standard cubic feet per hour (SCFH) must be marked on the top head or valve protection band in letters at least one-half inch high as follows "VENT RATE**SCFH" (with the asterisks replaced by the number representing the total rate of venting, in SCFH).

A14.4.2.4. Mark outer package “INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS” for the following:

A14.4.2.4.1. Nitric oxide prepared and certified according to **A6.20.** and the DOT 3A, 3AA, 3AL, or 3E1800 cylinders that are overpacked.

A14.4.2.4.2. Aerosols and compressed gases prepared and certified according to **A6.3.**

A14.4.2.4.3. Refrigerant gases or engine-starting fluid prepared and certified according to **A6.4.5.** and **A6.4.6.**

A14.4.2.4.4. Receptacles and cylinders identified in **A3.3.2.5.** requiring a strong outer packaging.

A14.4.2.5. Aerosols (UN1950) may be marked with a PSN authorized by 49CFR, IATA, or ICAO, not identified in **Table A4.1.**

A14.4.3. Class 3. When shipping flammable liquids, mark the shipping container with the flash point.

A14.4.4. Class 5. For bromine pentafluoride or bromine trifluoride prepared and certified according to A9.11. using a DOT 3E1800 cylinder, mark the outer packaging "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS."

A14.4.5. Class 6.

A14.4.5.1. Permanently mark outside plastic containers used for toxic (poisonous materials), by embossment or other durable means, with the word "POISON" in letters of at least 6.3 mm (1/4 inch) in height. Additional text or symbols may be included in the marking. The marking must be located within 15 cm (6 inches) of the packaging's closure.

A14.4.5.2. Mark packages containing Category A infectious substances with:

A14.4.5.2.1. The United Nations packaging symbol.

A14.4.5.2.2. The text “CLASS 6.2”.

A14.4.5.2.3. The last two digits of the year of manufacture of the packaging.

A14.4.5.2.4. The State authorizing the allocation of the mark (i.e., USA).

A14.4.5.2.5. The name or registered symbol of the manufacturer.

A14.4.5.2.6. All packages containing infectious substances must be marked durably and legibly on the outside of the package with the name and telephone number or a person responsible for the shipment.

A14.4.5.3. For packages containing UN3373, mark outer packagings with the words “BIOLOGICAL SUBSTANCE, CATEGORY B.” and “UN3373.” The UN3373 must be within a square-on-point shaped border with each side at least 50mm (2 inches). The width of the border line must be at least 2mm, and the letters and numbers must be at least 6mm in height. The background must be of a contrasting color from the package.

A14.4.5.4. Packages containing “BIOLOGICAL SUBSTANCE, CATEGORY B” will be marked to identify name and phone number for contact in an emergency.

A14.4.6. Class 7.

A14.4.6.1. General Requirements. In addition to other markings required by this attachment, the following markings are required on all Excepted packages,Types IP-1, IP-2, IP-3, Type A, Type B(U) or Type B(M) packages:

A14.4.6.1.1. Mark each package of radioactive materials over 50 kg (110 pounds) to show the gross weight including the unit of measurement marked on the outside of the package.

A14.4.6.1.2. When dry ice is used as a refrigerant, mark the PSN, UN Number, and net quantity on the outer package.

A14.4.6.1.3. Markings should be at least 12 mm high, except for packages of 30 L or 30 kg capacity or less should have a minimum height of 6 mm.

A14.4.6.2. Excepted Packages.

A14.4.6.2.1. Mark packages containing radioactive material meeting the definition of an excepted package with “Radioactive Material, Excepted Package.” A commercial label may be used for this marking.

A14.4.6.2.2. For limited quantities prepared and certified according to **A11.5.4.**, the package is not required to be marked with the PSN provided it is marked with the identification number preceded by the letters "UN" within a diamond.

A14.4.6.3. Industrial Packages.

A14.4.6.3.1. Mark each package of radioactive material that meets the requirements for Types IP-1, IP-2, or IP-3 packaging on the outside of the package with the words “TYPE IP-1” “TYPE IP-2” or “TYPE IP-3” as appropriate. Do not mark a package that does not meet these requirements.

A14.4.6.3.2. Mark on the outside of Type IP-1, Type IP-2, or Type IP-3 packaging with the international vehicle registration code of the country of origin of the design. The international vehicle registration code for packages designed in the United States is the symbol "USA."

A14.4.6.3.3. Mark on the outside of Type IP-1, Type IP-2, or Type IP-3 packaging with the name of the package manufacturer, or other identification markings as required by approval certificate issued by the competent authority.

A14.4.6.4. Type A Packages.

A14.4.6.4.1. Mark each package of radioactive material that meets the requirements for a Type A package with the words “TYPE A”. Do not mark a package that does not meet these requirements.

A14.4.6.4.2. Mark on the outside of Type A packagings with the international vehicle registration code of the country of origin of the design. The international vehicle registration code for packages designed in the United States is the symbol "USA."

A14.4.6.4.3. Mark on the outside of Type A packages with the name of the package manufacturer, or other identification markings as required by approval certificate issued by the NRC or the US Competent Authority.

A14.4.6.5. Type B Packages.

A14.4.6.5.1. Mark each package of radioactive material that meets the requirements for Type B(U) or Type B(M) packaging on the outside of the package with the words "TYPE B(U)" or "TYPE B(M)" as appropriate. Do not mark a package that does not meet these requirements.

A14.4.6.5.2. Identification mark allocated to the design by the NRC or the US Competent Authority.

A14.4.6.5.3. Serial number to uniquely identify each packaging which conforms to the design.

A14.4.6.5.4. Mark each outer packaging with a trefoil radiation symbol meeting the requirements of 49 CFR Appendix B to Part 172.

A14.4.7. Class 8. Mark the outer container of chemical kits prepared and certified according to **A12.6.** "CHEMICAL KITS" or "FIRST AID KITS" as applicable.

A14.4.8. Class 9.

A14.4.8.1. Wheelchairs for which the battery is removed and boxed for shipment according to **A13.6.**, mark the outer container containing the battery "THIS SIDE UP." This applies any time a battery is authorized to be removed from its holder, boxed, and shipped with equipment.

A14.4.8.2. Unless packaged, crated, or otherwise enclosed to prevent ready identification, the marking of the article or equipment of Class 9 with the proper shipping name and identification number is not required.

A14.4.9. Limited Quantities. Mark packages used for hazardous materials in limited quantities as "Limited Quantity" or "LTD QTY" in addition to proper shipping name and UN identification number. The UN identification number may appear within a square-on-point; however "Limited Quantity" or "LTD QTY" must still appear as part of the marking.

A14.4.10. Consumer Commodity and ORM Markings. Plainly, durably, and legibly mark each package containing a hazardous material meeting the definition of Consumer Commodities and classified as ORM-D with either "ORM-D" or "ORM-D-AIR". Place the marking on at least one side or end immediately following or below the PSN within a rectangle that is approximately 6.3 mm (1/4 inch) larger on each side than the ORM designation. Use the ORM designation for domestic shipments only.

A14.5. Consumer Product Warnings. An article, package, or container may bear a manufacturer's consumer warning symbol or statement. Presence of such a symbol or statement does not necessarily mean the article or contents meet the classification criteria as a hazardous material for military air transportation. Reference the Hazardous Material Information Resource System (HMIRS) or the product's Material Safety Data Sheet if hazard classification information is needed.

Attachment 15

LABELING HAZARDOUS MATERIALS

A15.1. General Requirements. Unless otherwise specified in this manual, apply the appropriate labels to the outer packaging of packages containing hazardous materials.

A15.1.1. Use labels meeting the commercial color and specifications outlined in 49 CFR 172.411 through 172.450, ICAO, or IATA. Do not use labels that are easily confused by their use, shape, and color, with the standard labels prescribed.

A15.1.2. Labels must be diamond-shaped with each side at least 10 cm (4 inches) long and have a solid line border 6.3 mm (0.25 inches) from the edge. “UN3373” labels may be 5 cm (2 inches) long.

A15.1.3. The hazard class and division number must be at least 6.3 mm (0.25 inches) and not greater than 12.7 mm (0.5 inches). The label text must be at least 7.6 mm (0.3 inches) and will be in capitalized Roman letters.

A15.1.4. It is the shipping activity's responsibility to establish procedures to locally fund for and procure hazardous material labels and commercial forms.

A15.1.5. Secondary hazards do not require labels.

A15.1.6. Comply with paragraph **1.13.8.** to ensure visibility of hazard labels during transportation. If hazard labels required by this attachment are not visible due to placement (located in the middle of an aircraft pallet, cargo bed covered by a tarp , within a freight container, etc), apply required labels to a marking board placed/attached to identify presence of each hazard classification.

A15.2. Hazard Labels.

A15.2.1. Affix to the outer packaging or (overpack) a primary hazard label and a subsidiary risk label(s) (if required) based on the hazard classification/subsidiary risk provided in columns 4 and 6 of **Table A4.1.** unless exempted by **A15.4.** Include the hazard class or division number in the bottom corner of the label(s). Labels that do not have the class or division number preprinted may be stamped or overprinted with the appropriate hazard class/ division number in the bottom corner of the label.

A15.2.1.1. For explosives, include the division number and compatibility group letter. Ensure the compatibility group letter is a capitalized Roman letter.

A15.2.1.2. For Division 5.1 oxidizers and Division 5.2 organic peroxides, include the division number in the bottom corner of the label.

A15.2.2. Attach labels to the part of the package bearing the PSN if package size is adequate. If package size is not adequate, use an overpack. Packages requiring a Radioactive Material label ("Category I-White", "Category II-Yellow" or "Category III-Yellow") will be labeled on opposite sides.

A15.2.3. Do not place labels over any identifying data on the container. Remove or obliterate any irrelevant labeling already on the packaging.

A15.2.4. When hazardous materials are placed in an overpack, the appropriate primary hazard label, subsidiary hazard label(s) and handling label(s) for each class must be applied to the outer package or container. If the primary hazard or subsidiary risk label(s) of another component of the overpack

already adequately identifies a primary or subsidiary risk it is not necessary to apply an additional label.

A15.2.5. When hazardous materials are palletized on a 463L or warehouse pallet, ensure the label is clearly visible.

A15.2.6. Position hazardous cargo loaded in the back of a vehicle so the labels are clearly visible, or apply the labels for each hazard loaded in the back of the vehicle to a marker board that is clearly visible.

A15.2.7. Label each Limited Quantity package for each dangerous good contained in the package.

A15.2.8. Excepted Quantities container only requires a completed "Dangerous Goods in Excepted Quantities" label attached to the container.

A15.2.9. Label hazardous waste with the appropriate hazard label and properly completed hazardous waste label.

A15.2.10. For items shipped under the PSN "Dangerous Goods in Machinery" or "Dangerous Goods in Apparatus" apply Package Orientation (This Way Up) labels to opposite vertical sides when required to ensure liquid hazardous materials remain in their intended orientation. If machinery or apparatus contains a magnetized material apply both a Class 9 (Miscellaneous) and a "Magnetized Material" label.

A15.2.11. A label(s) is not required for domestic shipments when use is exempted by a DOT special permit. For international shipments, the correct label(s) must be applied.

A15.2.12. Do not apply hazard labels to a package containing material that is not regulated.

A15.2.13. Labels required by this attachment for individual packages will be applied directly to stretch or shrink wrapping used or to a marking board (**A14.3.14.**). Orientation labels are not required if stretch or shrink wrap prevents incorrect loading of packages/containers.

A15.3. Handling Labels.

A15.3.1. Apply a "Cargo Aircraft Only" label on packaging (to include overpacks) not permitted on passenger aircraft as identified in column 7 of **Table A4.1.** Also apply to marking boards according to **A15.1.6.**, when applicable, if label is not visible.

A15.3.2. The "Cargo Aircraft Only" label is not required on cargo shipped according to **A17.3.** unless diverted as identified in **A17.3.5.**

A15.3.3. Apply a "Magnetized Material" label on packages containing magnetized material. An additional Class 9 label is not required. Also apply to marking boards according to **A15.1.6.**, when applicable, if label is not visible.

A15.3.4. Apply an "Empty" label when the packaging meets the requirements of paragraph **1.10.** Any container or cylinder shipped as empty must have the previously applied hazard labels removed, obliterated, destroyed, or completely covered by the "EMPTY" label.

A15.3.5. Apply "Keep Away From Heat" label to each outside package containing self-reactive substances of Class/Division 4.1 or organic peroxides of Class/Division 5.2.

A15.3.6. Labels required by 49 CFR, ICAO, or IATA may be affixed even if not required by this manual.

A15.3.7. A marking board may be used in lieu of applying a handling label(s) directly to a freight container (see **A14.3.14.**).

A15.4. General Requirements Applicable to Hazard Classes.

A15.4.1. Class 2.

A15.4.1.1. For packages containing oxygen, compressed; or oxygen, refrigerated liquid, a label with the word "OXYGEN" may be used in place of a label with the word "OXIDIZER," if the letter size and color are the same as those required for oxidizer. Alternatively, an "OXYGEN" label may be used in place of the "NONFLAMMABLE GAS" and "OXIDIZER" labels required in **Table A4.1.**

A15.4.1.2. Recoil mechanisms or artillery gun mounts prepared and certified according to **A6.5.8.**, must have a nonflammable compressed gas label applied to each exterior container. However, when shipped as an integral part of the complete weapon system, the nonflammable compressed gas label may be on the weapon or its exterior cover.

A15.4.2. Class 3. All flammable liquids, whose vapor pressure (Reid test) is more than 110 kPa (16 psi) at 38 degrees C (100 degrees F), must have a "white bung label," 76 x 127 mm (3 by 5 inches), affixed near the bung or closure of the container.

A15.4.3. Class 6.

A15.4.3.1. Label PG I or II material with either a "TOXIC" or "TOXIC INHALATION HAZARD" label as appropriate.

A15.4.3.2. Label hazard zone A or B material with a "TOXIC INHALATION HAZARD" label.

A15.4.3.3. Material classified as an infectious substance, that also meets the definition of a Class 2.3 toxic material or a radioactive material, must also be labeled with a "TOXIC GAS" (or INHALATION HAZARD) label or "RADIOACTIVE" label as appropriate.

A15.4.4. Class 7.

A15.4.4.1. Hazard Label. Each package requiring a "RADIOACTIVE" label must have two of these labels affixed to opposite sides of the package. The proper label to affix to a package of radioactive material is based on the radiation level at the surface of the package and the transport index. The proper category of label is determined according to **Table A15.1.** The first step is to determine the maximum radiation level at a distance of 1 meter from the external surfaces of the package, overpack or freight container, the value determined must be multiplied by 100. The final step is the figure obtained in step 1 must be rounded up to the first decimal place, except that a value of 0.05 or less may be considered as zero. Apply the highest category label required for any of the two determining conditions. Radioactive Category I-White is the lowest category and Category III-Yellow is the highest. For example: a package with a transport index of 0.8 and a maximum surface radiation level of 0.6 mSv/h (60 mrem/h) must bear a Category III-Yellow label (see **Table A15.1.**)

Table A15.1. Radioactive Label Requirements. (See Note 1).

Transport Index (TI)	Maximum Radiation Level at any Point on the External Surface	Label Category
0 (see Note 1)	Less than or equal to 0.005 mSv/h (0.5 mrem/h)	I - White
More than 0 but not more than 1 (see Note 2)	More than 0.005 mSv/h (0.5 mrem/h) but less than or equal to 0.5 mSv/h (50 mrem/h)	II - Yellow
More than 1 but not more than 10	More than 0.5 mSv/h (50 mrem/h) but less than or equal to 2 mSv/h (200 mrem/h)	III - Yellow
More than 10 (see Note 3)	More than 2 mSv/h (200 mrem/h) but not more than 10 mSv/h (1000 mrem/h)	III – Yellow

NOTES:

1. The category of label must be shown in Key 17 of the Shipper's Declaration for Dangerous Goods form and must also be applied to radioactive materials packages. Any package containing a "highway route controlled quantity" must be labeled as radioactive Category III-Yellow.
2. If the measured TI is not greater than 0.05, the value quoted may be zero.
3. If the TI is greater than 10, the package or overpack must be transported by SAAM airlift only (see **Attachment 24**)

A15.4.4.2. Subsidiary Risk Label. Label each package containing a radioactive material that also meets the definition of one or more additional hazards, as required by this attachment for the radioactive material and for each additional hazard. For example, label solid nitrates of uranium or thorium, "RADIOACTIVE" and "OXIDIZER." Subsidiary risk labels are not required for an uncompressed gas that is non-flammable and non-toxic.

A15.4.4.3. Label Marking. The contents, activity, and for Category II and III yellow labels, the transport index must be marked on the label. Additionally, the CSI must be marked on the CSI label. Enter the following information in the blank spaces by legible printing (manual or mechanical), using a durable weather resistant means of marking:

A15.4.4.3.1. Contents. Mark the contents as follows:

A15.4.4.3.1.1. Except for LSA-I material, the symbol of the radionuclide as listed in **Table A11.1.** Symbols that conform to established radiation protection terminology are authorized, (i.e., ^{99}Mo, ^{60}Co, etc).

A15.4.4.3.1.2. For mixtures of radionuclides, or for different individual radionuclides packed together in the same package, the most restrictive radionuclides must be listed to the extent that space on the line permits.

A15.4.4.3.1.3. LSA (except LSA-1) or SCO must have the symbol of the radionuclide followed by “LSA-II”, “LSA-III”, “SCO-I”, “SCO-II” as appropriate.

A15.4.4.3.1.4. For LSA-I material, only “LSA-I” is required to be marked.

A15.4.4.3.2. Activity. Express units in appropriate international units of Becquerels (Bq) or Terabecquerels (TBq). The customary units, i.e., curies (Ci), millicuries (mCi), or microcuries (uCi) may be included in parenthesis following the international units. Abbreviations are authorized. For a fissile material, the weight in grams or kilograms of the fissile radioisotope also may be inserted.

A15.4.4.3.3. Transport Index (TI). For Category II and Category III yellow labels only, the Transport Index must be marked in the box provided. It must be rounded up to one decimal place (see **Attachment 1**).

A15.4.4.3.4. Criticality Safety Index (CSI).

A15.4.4.3.4.1. The Criticality Safety Index label must be marked with the CSI as stated in the certificate of approval for special arrangement or the certificate of approval for the package design, issued by the NRC or the US Competent Authority, in the box provided.

A15.4.4.3.4.2. For overpacks and freight containers, the CSI on the label is the sum of the criticality safety indexes of the individual packages in the freight container or overpack as stated in the certificate of approval for the package design issued by the NRC or the US Competent Authority.

A15.4.4.3.5. Overpacks and Freight Containers. When one or more packages of radioactive material are placed within an overpack, the overpack must be labeled as prescribed in this paragraph except as follows:

A15.4.4.3.5.1. The content entry on the label may state “See Shipper’s Declaration” in place of the names of the radionuclides unless each inside package contains the same radionuclide(s).

A15.4.4.3.5.2. The activity entry on the label must be determined by adding together the number of becquerals of the radioactive materials packages contained in the overpack.

A15.4.4.3.5.3. For an overpack, the TI must be determined by adding together the transport indexes of the radioactive materials packages contained in the overpack. For a rigid overpack, the TI may alternatively be determined by direct measurement as prescribed in this paragraph; however, it must be taken by the person who initially offered the packages contained within the overpack for shipment.

A15.4.4.3.5.4. The category of Class 7 label for the overpack must be determined from **Table A15.1.** using the TI derived from the requirements in this paragraph and the maximum surface radiation level on the surface of the overpack.

A15.4.4.3.5.5. The category of the Class 7 label of the overpack and not that of any contained packages must be used in accordance with Table 1 of 49 CFR 172.504(E) to determine when the transport vehicle must be placarded.

A15.4.5. Class 8.

A15.4.5.1. Wet-cell batteries prepared and certified according to **A12.4.** must have "Package Orientation" labels indicating the upright position (top) of the container, if not already marked on the container as specified in **A14.3.7.**

A15.4.5.2. Label Chemical or First Aid Kits prepared in accordance with **A12.6.** with the primary hazard label and any subsidiary risk labels applicable to each individual hazard within the kit.

A15.4.6. Class 9.

A15.4.6.1. Equipment or articles of Class 9 do not require a label unless packaged, crated, or otherwise enclosed to prevent ready identification.

A15.4.6.2. Certify items containing both limited quantity radioactive and magnetic characteristics to the radioactive material. Although limited quantity radioactive material is exempt from labeling, a magnetic material label must be applied to the shipping container.

Attachment 16

AREA PLACARDING

A16.1. General Requirements. Placard the area surrounding aircraft transporting any hazardous materials when parked according to **Table A16.1.** or Service directives. If Service directives do no contain specific procedures for placarding, use the following guidance:

A16.1.1. Use placards that meet the general design, size, and color specifications of 49 CFR 172.519.

A16.1.2. For explosives, fire and chemical hazard symbols specified in DOD 6055.9-STD may be used in place of placards.

A16.1.3. Conspicuously display placards at the front, rear, and both sides of the aircraft unless emergency response access is restricted. Then post placards at entry points.

A16.1.4. Park aircraft transporting DOD Class 1.1, 1.2, and 1.3 explosives and any material identified as Inhalation hazard zone A in a remote area. Placarding is still required for these materials when parked in a designated restricted, posted, and traffic controlled parking or loading and unloading area.

A16.1.5. Park aircraft transporting all other types of hazardous materials in a placarded area. However, placarding is not required for these materials when parked in a designated restricted, posted, and traffic controlled parking or loading and unloading area.

A16.2. Responsibility for Placards.

A16.2.1. Military hosts are responsible for placarding at military bases.

A16.2.2. At nonmilitary airfields, the agency delivering cargo to the aircraft, or off loading cargo is responsible for making arrangements with the airport manager for identifying the cargo, isolating parking and loading, placarding, firefighting, and disaster response. Arrangements for using en route nonmilitary airfields is the responsibility of the activity having operational control of the aircraft.

A16.2.3. It is the shipping activity's responsibility to establish procedures to locally procure and fund for hazardous material placards.

A16.2.4. A description of the placards is shown in **Table A16.1.**

Table A16.1. Placard Requirements.

Placards Required for Parked Area Aircraft Containing Hazardous Cargo	
Hazard Class or Division	**Type of Placard**
(any quantity)	
1.1	EXPLOSIVES 1.1
1.2	EXPLOSIVES 1.2
1.3	EXPLOSIVES 1.3
2.3	TOXIC GAS
4.3	DANGEROUS WHEN WET
5.2 (Organic peroxide, Type B, liquid or solid temperature controlled)	ORGANIC PEROXIDE
6.1 (Inhalation hazard Zone A or B)	TOXIC INHALATION HAZARD
7 (Radioactive Category III-Yellow label only)	RADIOACTIVE
Hazard Class or Division	Type of Placard
(1,001 pounds or more aggregate gross weight)	
1.4	EXPLOSIVES 1.4
1.5	EXPLOSIVES 1.5
1.6	EXPLOSIVES 1.6
2.1	FLAMMABLE GAS
2.2	NONFLAMMABLE GAS
3	FLAMMABLE
4.1	FLAMMABLE SOLID
4.2	SPONTANEOUSLY COMBUSTIBLE
5.1	OXIDIZER
5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled)	ORGANIC PEROXIDE
6.1 (other than inhalation hazard, Zone A or B)	TOXIC
6.2	NONE REQUIRED
8	CORROSIVE

NOTES:

1. The quantity limitation will be the total gross weight of the packages comprising the shipment or different shipments of the same classification. When cargo contains two or more hazardous articles (other than explosives 1.1, 1.2, and 1.3) which are compatible (see **Attachment 18**), combine the gross weight and quantity for this purpose.
2. Use the explosive placard representing highest hazard. For example, if the area contains both Class 1.1 and 1.2, use the Explosive 1.1 placard.
3. For those hazard classes located in the lower portion of the table, placarding is not required if the aggregate gross weight of the packages of those classes is less than 454 kg (1001 lbs). A "DANGEROUS" placard may be used in place of the separate placards for two or more categories of hazardous material found in the lower portion of the table. When 1000 kg (2205 lbs) or more of one category of material from the lower portion of the table is loaded, the specific placard for that material is required, and a "DANGEROUS" placard may not be used to represent that material.

Attachment 17

CERTIFYING HAZARDOUS MATERIALS

A17.1. Shipper's Certification. Unless specifically exempted in this manual, the shipping activity must complete a shipper's certification according to this attachment for all military air shipments of hazardous materials.

A17.1.1. Certifying Official.

A17.1.1.1. An individual qualified according to **A25.3.** must inspect the hazardous materials prior to accomplishing the Shipper's Declaration for Dangerous Goods form.

A17.1.1.2. When transportation personnel are required to certify an item that requires special preparation (munitions, engines, etc), the item specialist or preparing activity will provide documentation indicating that the item is prepared properly for air shipment. Develop local procedures to determine acceptable documentation.

A17.1.2. Certification Reference. Certify hazardous materials to a packaging reference in this manual. Hazardous material may be certified to the ICAO, IATA, or Title 49 CFR under the following conditions:

A17.1.2.1. Comply with all requirements of the certifying document and with this manual.

A17.1.2.2. Shipments must be certified to this manual if:

A17.1.2.2.1. The passenger quantity limitations of the certifying document are exceeded.

A17.1.2.2.2. The PSN in **Table A4.1.** has other than a “P5” Special Provision Code.

A17.1.2.2.3. The material is forbidden on a passenger aircraft by the certifying document.

A17.1.2.2.4. The item is a vehicle or wheeled support equipment.

A17.1.2.2.5. The item is a non-DOT approved compressed gas cylinder, pressure vessel or fire extinguisher.

A17.1.2.3. Comply with requirements in **Attachment 20** for absorbent material in combination packages containing liquid hazardous materials.

A17.1.2.4. Include handling instructions identified in this manual for specific proper shipping names on the certification form in the "Additional Handling Information" block.

A17.1.2.5. See **A17.2.6.** for multiple mode shipments.

A17.2. Shipper’s Declaration for Dangerous Goods Certification.

A17.2.1. Forms Required. Complete shipper's certification on the "Shipper's Declaration for Dangerous Goods" standard commercial form. Two styles of the commercial form may be used. One style is designed with the "Nature and Quantity of Dangerous Goods" section left open for continuous printing. The other style is designed in a columnar format with the "Nature and Quantity of Dangerous Goods" section blocked and formatted with headings specifying each key entry (**Figure A17.3.**). It is the shipping activity's responsibility to establish procedures to locally procure and fund for the Shipper’s Declaration for Dangerous Goods form.

A17.2.1.1. Obtain the form through the procurement system from commercial vendors specializing in hazardous material transportation supplies.

A17.2.1.2. The form may be locally produced depending on local capabilities and economic feasibility.

A17.2.1.3. The form must meet the format, size, and color specifications outlined in IATA, Section 8-*Documentation.*

A17.2.2. Copies Required. Complete and sign at least three Shipper's Declaration for Dangerous Goods forms.

A17.2.2.1. Attach one certification form to the copy of the manifest that is placed on the aircraft.

A17.2.2.2. Attach one certification form to the originating station file manifest. Intransit or enroute terminals may reproduce (photocopy) the Shipper's Declaration for Dangerous Goods form for their station file if required.

A17.2.2.3. Place one certification form in a waterproof envelope and attach to the number one piece of the shipment.

A17.2.2.4. The three original forms used to offer hazardous material for military air transportation must have the vertical red hatch border and certifying official's signature. Carbon signatures are acceptable.

A17.2.2.5. Additional copies may be forwarded with the shipment. Vertical red hatch border is not required for any additional copies.

A17.2.3. Form Completion. Complete the Shipper's Declaration for Dangerous Goods form either manually (hand printed) or mechanically (typewriter, computer, etc.). The form may be completed by a combination of manual and mechanical means, as required, providing all entries are clear and legible. However, when possible, the shipping activity should complete the form entirely manually or entirely mechanically. Incorrect punctuation, spelling (other than Proper Shipping Name), or entries that touch column separating lines on the form is not justification for frustrating hazardous cargo. Entries may be either in upper or lower case or combination.

A17.2.3.1. Hazardous materials with different proper shipping names/UN numbers will not be shipped under the same transportation control number (TCN). Complete a Shipper's Declaration for Dangerous Goods according to this attachment to identify each proper shipping name/UN number identified by the TCN (see **A17.2.8.** and **A17.3.** for exceptions). A single Shipper's Declaration for Dangerous Goods will be used for multiple like items shipped under one TCN.

A17.2.3.2. The certifying official may make pen and ink changes to any key. Someone other than the certifying official may make pen and ink changes to Keys 1 (only to the telephone number and not to the address), 2, 3, 5, 8, 9, and 19 without affecting the certification. Personnel making a change to any key must sign next to the change. Additional relevant information may be added to Key 19 by someone other than the certifying official, provided all copies reflect the additional information and they are signed. All entries must be durable, clear, and legible on all copies. Shipments may be frustrated if any entry on the form is not clear and legible. If the Shipper's Declaration for Dangerous Goods form is rejected, the correction must be accomplished as described in this paragraph or an entirely new form must be completed and presented to the shipping activity.

A17.2.3.3. Leave blank any key that does not require an entry (i.e., Key 14 when there is no subsidiary risk).

A17.2.3.4. If the Shipper's Declaration for Dangerous Goods does not contain sufficient space in any one key to accommodate all of the required information, use an additional Shipper's Declaration as an extension page. Each page must show the page number and total number of pages (Key 4). All pages must have the vertical red hatch border.

A17.2.4. Not Enough Copies or No Copies. In instances where there are not enough copies of the Shipper's Declaration for Dangerous Goods, a certified "true copy" may be placed with the station file manifest. When making a true copy:

A17.2.4.1. Annotate all the information verbatim from the original Shipper's Declaration for Dangerous Goods.

A17.2.4.2. Use the information in the signature block from the original form and annotate it on the true copy, (i.e., John Doe, 2 Oct 90). On the reverse side of the form, type or clearly print the words "True Copy" and the name of the individual who is certifying the form to be a true copy. This official must sign the form in longhand above the typed or printed name. The individual preparing a "true copy" need not be qualified according to **A25.3.** to certify the Shipper's Declaration for Dangerous Goods as a true copy.

A17.2.5. Split Shipments. When a shipment is split according to procedures identified in DOD 4500.9R, DTR.

A17.2.5.1. Someone other than the certifying official may change key 5 and key 16 entry for number of packages only. The individual making the change must sign above it.

A17.2.5.2. All other entries in key 16 (i.e., type of packaging and net quantity) will only be changed by the certifying official.

A17.2.5.3. Prepare a "true copy" according to **A17.2.4.** The original shipper’s certification form will accompany the aircraft manifest with the first shipment. Attach a split shipment “true copy” to aircraft manifest and station manifest for subsequent shipments. Each Shipper’s Declaration must reflect the correct TCN and number of packages.

A17.2.5.4. Enter statement, “Shipment split at XXX (use Air terminal three letter code) IAW DTR, Part II” on reverse side of all Shipper’s Declaration forms.

A17.2.6. Multiple Mode Shipments. Shipments certified to the ICAO, IATA, or 49 CFR that do not exceed the passenger quantity limitations of the certifying document may use the same Shipper's Declaration for Dangerous Goods for both the commercial and military segments of air transport. Include any information required by **A17.1.2.** For shipments that exceed the passenger quantity limitations of the ICAO, IATA, or 49 CFR:

A17.2.6.1. Complete a Shipper's Declaration for Dangerous Goods according to the ICAO, IATA, or 49 CFR for the commercial segment and a separate Shipper's Declaration for Dangerous Goods according to this manual for the military segment.

A17.2.6.2. Place copies of the Shipper's Declaration for Dangerous Goods needed for subsequent movement in a waterproof envelope on the number one piece of the shipment.

A17.2.6.3. DOD aerial port personnel will remove the copies of the Shipper's Declaration for Dangerous Goods from the waterproof envelope and obliterate the "cargo aircraft only" label if not required for military transport.

A17.2.7. Classified Information. Follow DOD 4500.9R, Defense Transportation Regulation, Part II, Chapter 205 and MIL-STD-129 for marking and documenting classified hazardous materials. If the information to be entered on the Shipper's Declaration is classified, the following procedures apply:

A17.2.7.1. Complete the signed original in detail, including essential classified data, and attach to the manifest that is placed on the aircraft. Once the classified information is applied, the Shipper's Declaration for Dangerous Goods must carry the same classification as the highest classification of the entered information.

A17.2.7.2. The manifest on the aircraft must carry the same classification as the classified information until the classified Shipper's Declaration for Dangerous Goods is detached and handled according to applicable security regulations.

A17.2.7.3. Complete the station file copy in detail except for the classified information. Enter the following statement in "Additional Handling Information" (Key 19): "See aircraft commander's copy of Shipper's Declaration for Dangerous Goods for complete information."

A17.2.8. Kits.

A17.2.8.1. If shipping a kit consisting of more than one container, enter in Key 19 the statement: "contained in kit piece number ***" (replace "***" with the piece number which contains the hazardous material).

A17.2.8.2. When more than one PSN is authorized to be packaged in a single container(s) as a "kit" (see **Attachment 1**, definition of "Kit"), complete information in Keys 11-18 for each PSN. Identify in Key 19 that the item is a kit. This does not apply to an item classified and described in **Table A4.1.** as a "KIT" (e.g. FIRST AID KITS, CHEMICAL KITS, POLYESTER RESIN KITS, etc).

A17.2.8.3. When an item is described in **Table A4.1.** as a "KIT", enter the aggregate quantity of hazardous materials in Key 16.

A17.2.9. Secondary Load. Complete a Shipper's Declaration of Dangerous Goods according to this attachment for each secondary load.

A17.2.10. Emergency Telephone Number. DOD activities will enter the applicable telephone number(s) in Key 19. Enter the phone number only one time if the number applies to each hazardous material on the manifest. Include the area code or international access code.

A17.2.10.1. For Class 1 material, contact The Army Operations Center, (703) 697-0218/0219 (COLLECT), or DSN 227-0218/0219. Ask for the Watch Officer.

A17.2.10.2. For radioactive material, contact:

A17.2.10.2.1. Army: (703) 697-0218 (COLLECT)

A17.2.10.2.2. Air Force: (202) 767-4011 (COLLECT)

A17.2.10.2.3. Navy / Marines: (757) 887-4692 (COLLECT), or 1-888-528-0148

A17.2.10.2.4. DLA: 1-800-851-8061 (COLLECT)

A17.2.10.3. For all other hazardous materials, enter the domestic and international contact numbers for the DOD Emergency Response Hotline:

A17.2.10.3.1. Domestic: 1-800-851-8061 (toll free)

A17.2.10.3.2. International: 1-804-279- 3131(collect)

A17.2.10.4. Shipments originating from non-DOD activities use a company, safety organization, or other contact telephone number applicable to the material shipped.

A17.3. Exceptions for Operations Conducted According to DOD 4500.9R, DTR, Part III (Mobility). Prepare the Shipper's Declaration for Dangerous Goods according to this manual for mobility operations. The following exceptions may be used for tactical, contingency, and emergency operations (to include exercises) and other deployment operations conducted according to DTR, Part III.

A17.3.1. Complete and sign at least two copies of the Shipper's Declaration for Dangerous Goods Form. Attach one form to the copy of the manifest that is placed on the aircraft and one copy to the originating station file manifest.

A17.3.2. A single Shipper's Declaration for Dangerous Goods may be used to identify and certify more than one type of hazardous material (except radioactive material) when shipped under a single mobility TCN (DOD 4500.9R, Part III, Appendix H) or when **Chapter 3** of this manual is authorized.

A17.3.3. Certification is not required for hand-carried hazardous materials authorized according to paragraph **3.5.**

A17.3.4. The following exceptions may be made when completing the Shipper's Declaration for Dangerous Goods according to **Figure A17.1.**

A17.3.4.1. Key 2, Key 8, and Key 9. Enter "worldwide mobility."

A17.3.4.2. Key 5. Enter the transportation control number (TCN), developed according to DOD 4500.9R, DTR *Part III – Appendix H*

A17.3.4.3. Key 7. Although the label is not required on the cargo, Key 7 must have the "Passenger and Cargo Aircraft" block deleted if the material is cargo aircraft only.

A17.3.4.4. Keys 11-18. Different hazardous materials may be entered when prepared as a single shipment unit.

A17.3.4.5. Key 19. Complete Key 19 according to this attachment and **Figure A17.1.** for individual items.

A17.3.5. Diverting Hazardous Materials to Nontactical Airlift. Hazardous materials certified for mobility operations may be diverted to nontactical airlift without completion of a new Shipper's Declaration for Dangerous Goods provided the following conditions are met:

A17.3.5.1. All hazardous materials packaged according to manual which are part of a single shipment are compatible according to **Table A18.1.** and **Table A18.2.**

A17.3.5.2. Hazardous materials which are part of the single shipment unit are compatible with all other hazardous materials according to **Table A18.1.** and **Table A18.2.**

A17.3.5.3. Vehicle and equipment fuel levels do not exceed limits authorized for nontactical airlift.

A17.3.5.4. Use provisions of **A17.2.4.** when extra copies of the Shipper's Declaration for Dangerous Goods are needed.

A17.4. Certification Requirements for Specific Items.

A17.4.1. Class 1.

A17.4.1.1. For captured ammunition and ammunition with unknown characteristics shipped according to **A3.3.1.7.**, include in key 17 the reference to **A3.3.1.7.** and the applicable packaging paragraph from **Table A4.1.** (for example, "**A3.3.1.7./A5.21.**"). Include a copy of the EOD safety certification. Comply with **A17.2.7.** for classified information.

A17.4.1.2. Identify any munition or ordnance item containing OTTO Fuel II as a propellant with the following entry in Key 19: "Contains Otto Fuel II as a liquid propellant. In the event of a leak, avoid direct skin contact, ingestion, or inhalation of vapors. Vapors are toxic and may cause severe headache and nausea."

A17.4.1.3. Identify fired exercise torpedoes or rockets, no longer containing explosive components, with OTTO Fuel II residue remaining as "Environmentally Hazardous Substance Liquid, N.O.S. (OTTO Fuel II)" and prepare according to **A13.2.2.15.**

A17.4.1.4. When shipping unpackaged explosives as specified in paragraph **A5.3.**

A17.4.1.4.1. Complete Keys 11 through 15 according to **Figure A17.1.** for each different PSN/UN Number.

A17.4.1.4.2. Complete Key 16, as applicable, identifying the total net explosives weight per PSN/UN Number (e.g., "On Airdrop Platform X 50 Kg N.E.W", "In Ready Racks X 15 Kg N.E.W", and "In ISU X 30 Kg N.E.W.").

A17.4.1.4.3. Enter "**A5.3.**" in Key 17.

A17.4.1.5. When explosives are installed or embedded according to **A5.2.**, use the article's overall description as the proper shipping name (e.g., Vehicle, Flammable Liquid Powered for an aircraft containing the engine). Identify all installed or embedded explosive components as secondary hazards in Key 19.

A17.4.1.6. When secured in authorized packaging and loaded on a tactical vehicle as an operational component according to specified procedures in a technical manual or publication, cite appropriate packaging reference from **Attachment 5**.

A17.4.1.7. When packaging requirements are included as part of a classification of explosives approval, cite **A5.4.** in Key 17. A copy of the classification approval must accompany the shipment.

A17.4.1.8. Use the DOD Joint Hazard Classification System (JHCS) to complete certification information unless a final/interim hazard classification or a DOT approved classification is used according to **A3.3.1.4.**

A17.4.1.9. Class 1 items identified in the JHCS or by Service approved interim hazard classification as also requiring a Radioactive Material label will have the radioactive material subsidiary risk identified in Key 14 (e.g., 1.2.2E (7)).

A17.4.1.10. For Grandfathered items certified according to **Attachment 27**, add “Government-owned goods packaged before January 1, 1990” in key 19.

A17.4.1.11. For items containing liquid or hypergolic fuel that is corrosive and/or toxic include the following statement in Key 19: "Exercise extreme caution in handling this item. Keep well ventilated, away from sparks, fire hazards, and oxidizing materials. Vapors are toxic when inhaled. Liquid is corrosive.” One of the following statements must also be added:

A17.4.1.11.1. "Leak detection indicator not required"

A17.4.1.11.2. "Monitor leak indicator according to shipper provided instructions."

A17.4.1.11.3. "Technical escort required."

A17.4.1.12. If a warehouse pallet includes like items (same PSN and Identification Number) in both UN Specification and Grandfathered packaging, complete Keys 16 and 17 as specified in this manual for individual packages or containers.

A17.4.2. Class 2.

A17.4.2.1. Cryogenic Liquids. For cryogenic liquids prepared according to **A6.11.** provide venting instructions in Key 19. This is not required if venting procedures are provided in a separate instruction accompanying the shipment. Include the location and description of the vent valve. If the cylinder is empty and purged, venting is not required; comply with paragraph **1.10.4.** For regulated cylinders, include one of the following statements for venting the unit:

A17.4.2.1.1. "Vent container to outside of aircraft."

A17.4.2.1.2. "Container is excepted from venting."

A17.4.2.2. Fire Extinguishers. Fire extinguishers removed from an authorized holder of a vehicle or equipment being airdropped does not require separate certification. Identify as a secondary hazard of the vehicle or equipment. Package the fire extinguisher in a strong outer container. This only applies to the fire extinguisher that is assigned as an installed component of the vehicle or equipment. Package and certify spare/stowed cylinders according to this manual.

A17.4.2.3. Multiple-Element Gas Container.

A17.4.2.3.1. Enter the total quantity of all cylinders for each Multiple-Element Gas Container in Key 16 (e.g., 1 Multiple-Element Gas Container X 40 kg)

A17.4.2.3.2. Use appropriate packaging paragraph from **Attachment 6** for to identify DOT or UN cylinder.

A17.4.2.3.3. Cylinders which are not manifolded to form a single unit will be certified as individual cylinders (e.g., 4 DOT 3AA Cylinders X 10 kg).

A17.4.3. Class 3. Spare fuel in UN Specification jerricans (see **A3.3.3.5.**) when transported in approved, permanently configured and mounted holders may be certified as part of a vehicle or support equipment (see **A17.4.5.1.**).

A17.4.4. Class 6. A Shipper's Declaration for Dangerous Goods is not required for Biological Substances, Category B, UN3373 provided:

A17.4.4.1. The package is marked "Biological Substance, Category B."

A17.4.4.2. "UN 3373" is contained within a square-on-diamond label displayed on the outer packaging of on a background of contrasting color.

A17.4.4.3. Hazardous materials (in Packing Group II or III) used to stabilize or prevent degradation of the sample does not exceed 30 mL (1 ounce) or 30 g (1 ounce) in each inner packaging.

A17.4.4.4. The completed package meets requirements of **A10.9.**

A17.4.5. Class 7.

A17.4.5.1. For radioactive Category II-Yellow Category III-Yellow, enter in Key 19, “Radioactive material is intended for use in, or incident to, research, medical diagnosis, or treatment” when applicable.

A17.4.5.2. Packages marked “Radioactive Material, Excepted Package” according to A14.4.6.6 do not require a Shipper's Declaration For Dangerous Goods.

A17.4.6. Class 9.

A17.4.6.1. Vehicles, Engines Internal Combustion, Fuel Devices, and Other Equipment.

A17.4.6.1.1. For items prepared according to **A13.4.**, **A13.5.**, or **A13.6.**, identify the primary hazard Class 9 description in keys 11-14. In key 19 show:

A17.4.6.1.1.1. The PSN, hazard class, and net quantity of flammable fuel within tanks and/or system. For example; "Fuel, Aviation, Turbine Engine, Class 3, 10 gal". When an item is completely drained (but not purged) , the shipper's estimate of the quantity of fuel remaining in the unit may be entered. Refer to **A13.5.** or **A13.6.** for authorized fuel levels.

A17.4.6.1.1.2. The PSN and hazard class for secondary hazards (batteries, mounted cylinders and fire extinguishers, installed engine starting fluid, etc). Show number of secondary hazards. For example; "1 each Batteries, Wet, Filled with Acid, Class 8" or "2 ea. Fire Extinguishers, 2.2".

A17.4.6.1.1.3. Integral installed fire suppression systems will be identified in key 19.

A17.4.6.1.1.4. Identify mounted engines and generators that are by design an approved part of an M-Series vehicle in Key 19 as a secondary hazard (also identify hazardous components such as batteries).

A17.4.6.1.1.5. Engines and generators mounted, secured or carried as an accompanying load on a vehicle, support equipment or trailer for convenience of movement or handling are considered secondary loads, and will require a separate certification.

A17.4.6.1.1.6. The name and quantity of any non-hazardous fuel in vehicles or equipment tanks.

A17.4.6.1.1.7. When an item is drained and purged of any flammable liquid, but is being certified due to another hazard, enter "Drained and Purged."

A17.4.6.1.1.8. Include the statement "non-hazardous battery installed" if applicable.

A17.4.6.1.1.9. Reference to the technical directive used to prepare the item for military air shipment is not required, except for fuel servicing equipment and vehicles drained in accordance with technical directives (technical orders, field manuals, etc.). In this case, indicate the directive used: "Drained IAW T.O. XX-XX-XX"

A17.4.6.1.1.10. A separate certification is not required for spare fuel in UN specification jerricans secured in permanently configured and approved holders of the transporting vehicle or equipment. Identify the number of jerricans and quantity of fuel in each jerrican in Key 19 of the Shipper's Declaration form for the transporting vehicle or equipment. Example - "4 Jerricans X 5 gals"; "1 Jerrican X 5 gals"; "1 Jerrican X 3 gals." DOT 5L jerricans secured in permanently configured and approved holders may be documented in the same manner provided they are drained to the greatest extent possible.

A17.4.6.1.2. Drained and purged repairable engines and fuel devices prepared according to A13.5.5. and A13.5.7. are not hazardous for transportation. Follow procedures specified in paragraph **1.10.4.**

A17.4.6.1.3. Certification is not required for movement of wheelchairs with patients.

A17.4.6.1.4. Dual-powered vehicles (designed to operate on both flammable liquid and gas) must meet the requirements of **A13.4.** for each fuel tank. Describe as "Vehicle, Flammable Liquid Powered".

A17.4.6.1.5. Describe vehicles fueled with a combustible liquid (flashpoint greater than 60.5 degrees C) as "Vehicle, Flammable Liquid Powered".

A17.4.6.1.6. If a vehicle, equipment, machinery, or apparatus contains magnetized material with a magnetic field strength greater than 0.002 gauss or more, measured at 2.1m (7 ft) from the source, enter “Contains Magnetized Material” in Key 19. Magnetic material that has a field strength greater than 0.00525 gauss at 4.6m (15 feet) from the source is forbidden for air movement.

A17.4.6.1.7. When wings an/or external fuel tanks are removed from an aircraft or helicopter to facilitate loading on the transport aircraft, consider all pieces as a single unit for identification on the Shipper’s Declaration for Dangerous Goods form.

A17.4.6.2. Life-Saving Appliances. For life-saving appliances, Class 9, prepared according to **A13.12.**, show:

A17.4.6.2.1. A specific description and the number of the items packaged for shipment in Key 16. For example; "1 wooden box x 3 self-inflating life vests".

A17.4.6.2.2. The PSN, hazard class and net quantity of each hazardous component within the shipping container in Key 19.

A17.4.6.3. Dry Ice. When dry ice is used as a refrigerant for another hazardous material, identify the dry ice as a secondary hazard by PSN, hazard class, and net quantity in Key 19 of the Shipper's Declaration form. Ensure packaging meets the requirements of **A13.10.**

A17.4.6.4. Consumer Commodity. The hazard classification "ORM-D" may be used in Key 13 for domestic shipments only.

A17.4.7. Competent Authority Approvals (CAA). If the shipment is packaged and transported under the authority of a CAA (Packaging or Hazard Classification), cite the CAA number in Key 17. and annotate Key 19, "PACKAGING AUTHORIZED BY COMPETENT AUTHORITY OF THE UNITED STATES OF AMERICA (USA)." If the CAA is from a country other than the USA, that country must be annotated in place of USA on the shipping papers. If the CAA does not have a num-

ber assigned to it, certify the shipment to **A5.4.** (see paragraph **2.5.2.**). A copy of the CAA must accompany the shipment.

A17.4.8. Empty Packaging. Packagings considered empty according to paragraph **1.10.** do not require a Shipper's Declaration for Dangerous Goods form. Follow procedures specified in paragraph **1.10.4.**

A17.4.9. Excepted Quantities. A Shipper's Declaration for Dangerous Goods is not required for excepted quantities prepared according to **A19.2.** Annotate the shipping papers "Dangerous Goods in Excepted Quantities" and use a Dangerous Goods in Excepted Quantities" label (see **A15.2.**). Passenger restrictions do not apply to items in excepted quantities.

A17.4.10. Label Exempt Shipments. When use of hazard class label(s) are exempted by a DOT Special Permit (DOT-SP) for a domestic shipment, annotate Key 19: "Hazard Class Label (or Labels) exempted by DOT-SP (enter permit number, e.g., DOT-SP XXXX).

A17.4.11. Grandfathered Shipments. Certify grandfathered munitions shipments according to the applicable paragraph in **Attachment 27**.

A17.4.12. Consumer Commodity. Enter "**A13.3.**" in Key 17 of the Shipper's Declaration for Dangerous Goods when an item is classified as a "Consumer Commodity" regardless of the original hazard classification of the substance within an individual inner packaging or receptacles.

A17.4.13. Limited Quantity. Enter "**A19.3.**" in Key 17 of the Shippers Declaration For Dangerous Goods when an item, regardless of original classification, is packaged as a limited quantity.

A17.5. Completing the Shipper's Declaration for Dangerous Goods. Use **Figure A17.1.** for detailed instructions on accomplishing the shipper's certification form for nonradioactive and radioactive shipments. Use **Figure A17.2.** to determine if a Shipper's Declaration for Dangerous Goods is required for radioactive shipments.

A17.5.1. For forms with the "Nature and Quantity of Dangerous Goods" in columnar format, enter information in the appropriate column according to **Figure A17.1.**

A17.5.2. For forms with the "Nature and Quantity of Dangerous Goods" open for continuous printing, enter the basic description according to **Figure A17.1.** Example: "UN2744, Cyclobutyl chloroformate, 6.1 (8,3), PG II."

A17.5.3. For forms with the "Nature and Quantity of Dangerous Goods" open for continuous printing, use two oblique strokes, i.e. "//", to separate sequences of information or place each sequence on a separate line. Separate information within a sequence with a comma. See **Figure A17.3.** to identify separation of each sequence.

Figure A17.1. Step-by step Instructions for Completing Shipper's Declaration for Dangerous Goods Form.

Key 1. Shipper. Enter the address and telephone number where the hazardous material was certified.

Key 2. Consignee. Enter the six-digit Department of Defense Activity Address Code (DODAAC) and/or the in-the-clear geographical location of the ultimate consignee (if known.) or "Worldwide Mobility" according to **A17.3.**. For infectious substances, enter also the name and telephone number of a responsible person for contact in an emergency.

Key 3. Air Waybill No. The aircraft manifest number to which the Shipper's Declaration for Dangerous Goods will be attached may be entered in this key. This number need not be entered by the shipper. It may be entered by the accepting operator at the time it is assigned. This key may also be left blank.

Key 4. Page...of...Pages. Enter the page number and total number of pages of the Shipper's Declaration for Dangerous Goods form. Enter "Page 1 of 1 Pages" or leave blank if there are no extension pages.

Key 5. Shipper's Reference Number. Enter the 17-character transportation control number (TCN).

Key 6. Optional Block. Inspection activity will annotate date of inspection and acceptance for air movement according to **A28.1.2.** Shipper unit cargo identification information may also be entered.

Key 7. Shipment Within Passenger Aircraft and Cargo Aircraft Limitations. Use the following to determine limitations:

7.1. If the shipment is acceptable for movement on both passenger and cargo aircraft ("P5" in **Table A4.1.**, Column 7), delete "Cargo Aircraft Only."

7.2. If the shipment is allowed only by cargo aircraft (“P1” “P4” in **Table A4.1.**, Column 7), delete "Passengers and Cargo Aircraft."

7.3. If the shipment is certified to a special approval document which identifies the mode of transportation as Cargo Aircraft Only, delete “Passengers and Cargo Aircraft.” This applies even if the PSN is identified as a “P5” in **Table A4.1.**, Column 7.

7.4. If the shipment is certified to a Special Approval document which identifies the mode of transportation as acceptable by either Passenger Aircraft or Cargo Aircraft Only, use the “P” code from **Table A4.1.**, Column 7 to determine passenger limitations.

Key 8. Airport of Departure. Enter the three-digit Port of Embarkation (POE) and/or the in-the-clear geographical location of the airport of departure. "Worldwide Mobility" may be entered according to **A17.3.**

Key 9. Airport of Destination. Enter the three-digit Port of Debarkation (POD) and/or the in-the-clear geographical location of the airport of destination. Enter "Worldwide Mobility", if applicable, according to **A17.3.**

Key 10. Shipment Type.

10.1. Delete "Radioactive" if the shipment contains no radioactive material.

10.2. Delete “Nonradioactive” if the shipment contains radioactive material.

Key 11. UN, NA, OR ID No. Enter the United Nations (UN), North American (NA), or identification number (ID) given in column 4 of **Table A4.1.** Include the UN, NA, or ID prefix and the number.

Key 12. Proper Shipping Name. Enter the PSN shown in **Table A4.1.** Enter the following information, if applicable, in association with the basic description:

12.1. Technical name, in parentheses, when required by **Attachment 4**.

12.2. The letters “RQ” preceding the PSN for a hazardous substance (see **A4.5.**).

12.3. For materials which are toxic (poisonous) by inhalation, enter the words "TOXIC-INHALATION HAZARD" and "ZONE A", "ZONE B", "ZONE C", or "ZONE D" for gases, or "ZONE A" or "ZONE B" for liquids, as appropriate. The word "TOXIC" need not be repeated if it is already identified in the PSN (i.e. enter "INHALATION HAZARD" and the appropriate zone).

12.4. The word "Waste" preceding the PSN for a hazardous material that is a hazardous waste.

Key 13. Class and Division. Enter the hazard class and division number given in column 3 of **Table A4.1.**

13.1. For Class 1 material, enter either the Inhabited Building Distance (IBD) or Subdivision if assigned in the DOD Joint Hazard Classification System (JHCS) or classification approval document (i.e., IBD: “(18)” or Subdivision: “1.2.1”). The words “Subdivision” and “IBD” are optional.

13.2. For Class 1 material, include the compatibility group letter. A compatibility group letter for non-Class 1 material, when assigned in JHCS for storage, is optional.

13.3. For a single item with more than one hazard, enter the hazard class number of the item's primary hazard.

Key 14. Subsidiary Risk. Enter the subsidiary risk if given in column 6 of **Table A4.1.** in parenthesis following primary hazard classification (e.g., 8 (3,6.1). Subsidiary risks may be identified by sources other than **Table A4.1.** (e.g. MSDS). If the subsidiary risk was obtained by a source other than **Table A4.1.**, annotate the source in key 19. For example: “Subsidiary Risk Assigned Per MSDS.”

Key 15. Packing Group. Enter the applicable Packing Group (PG) given in column 5 of **Table A4.1.** Enter "II" as the Packing Group for Class 1 (Explosives) unless otherwise specified.

Key 16. Quantity and Type of Packing.

16.1. Nonradioactive shipments enter:

16.1.1. The number of packages (of same type and content) and their type of packaging.

16.1.2. Type of packaging listed in this key is the authorized packaging identified in the packaging paragraph. Identify the type of packaging by text description of the outer packaging. UN Specification code is optional. For example: 1 fiberboard box x 3 kg (6.6 pounds); 1 fiberboard box (4G) x 3 kg (6.6 pounds), etc.

16.1.3. For specifically named self-propelled vehicle and mechanical apparatus enter nomenclature or basic description of the item (i.e., truck, generator, etc.).

16.1.4. The weight, volume, or other applicable measure of the actual hazardous material (per package).

16.1.4.1. Do not include any nonhazardous content of the shipment.

16.1.4.2. Enter the net quantity in metric measurement units. The equivalent English unit of measure may be entered in parenthesis immediately following the metric unit.

16.1.4.3. Show the quantity per package immediately following the number and type of package (i.e., 2 wooden boxes x 4.5 kg (10 pounds); 1 fiberboard box (4G) x 5 L (1.3 gallons)).

16.1.4.4. Batteries (UN3028, UN2794, UN 2795, and UN2800) may be identified by the gross weight of the batteries per outer container (e.g., 1 fiberboard box (4G) x 25 kg gross)

16.1.4.5. For explosives enter the "Net Explosive Weight (NEW)" in metric weight per package or per warehouse pallet or skid (i.e., 3 wooden boxes x 120 kg (264.6 pounds) NEW; or 1 warehouse pallet x 200 kg (441 pounds) NEW). Entry of pounds in association with metric weight is preferred but not required. It is acceptable to round off (to the right of the decimal point) the net explosives weight (NEW) listed in the Joint Hazard Classification System (JHCS) or other classification document required by **A17.4.1.9.** when completing Key 16, provided the quantity of explosives is not reduced.
Example: 0.06432 kg NEW may be shown as “0.07 kg NEW” in Key 16.

16.1.4.6. For items classified as a non-explosive that contain explosive components (e.g., 3L, 3J, 8S, etc.) use the quantity of the assigned predominate hazard.

16.1.4.7. Express in kilograms (pounds), not pounds per square inch, the quantity of compressed gas unless otherwise specified in this instruction. When certifying to **A6.2.** “Aerosols,” **A6.3.** “Small Receptacles Containing Compressed Gases,” **A6.7.** “Fire Extinguishers,” **A6.10.** “Cigarette Lighter or Other Similar Devices Charged with Fuel,” and **A13.3.** “Consumer Commodity” (Aerosols) other units of measure; (i.e., fluid ounces, gallons, or ounces) are specified and may be shown on this form. See also **A26.5.**

16.1.5. When an overpack is used for handling purposes and prevents identification of contents and/or UN specification markings, enter the words “Overpack Used”. Identify the number of overpacks if more than one is used.

16.1.6. For magnetized material, enter the number and type of packaging. No entry for net quantity is required. Weight or size of container is optional.

16.2. Radioactive shipments enter:

16.2.1. Name or symbol of the radionuclide in the material.

16.2.2. Description of the physical and chemical form of the material, if it is not in special form (generic chemical description is acceptable for chemical form). If special form, enter "Special Form."

16.2.3. The number of packages (of same type and content), the type of package, and the activity contained in each package in terms of Becquerel or Terabecquerel. The equivalent customary unit of measure (i.e., Ci, mCi, or uCi) may be included in parenthesis.

Key 17. Packaging Instructions.

17.1. Nonradioactive shipments enter:

17.1.1. The packaging paragraph from the applicable packaging reference authorized in **A17.1.2.** used to prepare the material for shipment.

17.1.1.1. AFMAN 24-204(I), use packaging paragraph in **Table A4.1.**, Column 8 (e.g., "**A9.8.**", "**A13.5.**", etc) or **Attachment 27** (e.g., "**A27.2.**", "**A27.9.**", etc.). Use of sub-paragraphs from this manual (e.g., "**A5.24.1.**) are not required when completing this key but, if used, the sub-paragraph used must properly identify the package, container, or shipment configuration.

17.1.1.2. IATA, Dangerous Goods Regulations, use packing instruction from Section 4, "List of Dangerous Goods" (e.g., "806", "134", etc.)

17.1.1.3. ICAO, Technical Instructions, use packing instructions from Table 3-1, "Dangerous Goods List" (e.g., "309", "619", etc.)

17.1.1.4. 49CFR, use packaging reference from Part 173 specified in the Hazardous Materials Table (172.101, Column 8b), (e.g., 173.62, 173.202, etc)

17.1.2. If the packaging has been approved by a DOT Special Permit, CAA, COE, or waiver cite the approval number (i.e., AFMC 24-204-96-09; COE NA-84-505; DOT-SP 3849; etc.) See **A17.4.1.** when the packaging requirement is included as part of the explosives hazard classification approval document.

17.1.3. If a UN packaging specification certified package is overpacked to meet air eligibility requirements, cite **A3.2.3.** and the applicable packaging paragraph for the material. Cite the applicable packaging paragraph for the material when packing inner containers into a 1A2 drum to meet air eligible and UN specification configuration requirements.

17.2. Radioactive shipments enter (see **Figure A17.2.**, steps 5 and 6 for assistance):

17.2.1. Packaging paragraph from **Table A4.1.** used to prepare the material for shipment.

17.2.2. Category of the package (i.e., "I-White," "II-Yellow," or "III-Yellow").

17.2.3. The transport index, preceded by the prefix "Ti", assigned each package having a "Radioactive Yellow-II" or "Radioactive Yellow-III" label and dimensions of each package, including dimensional units (for drums, the capacity is acceptable (i.e. 55 gallons)).

17.2.4. The fissile class. If the package is exempt enter the words "Fissile Exempt."

Key 18. Authorization.

18.1. Nonradioactive shipments enter:

18.1.1. When applicable, enter the words "Limited Quantity" or "LTD. QTY."

18.2. Radioactive shipments enter Approval Identification Markings (if relevant). List the package identification markings of any of the documents listed below issued by a competent authority. Include the words "attached" to indicate that the documents are attached to the declaration form.

18.2.1. Special form approval certificate.

18.2.2. Type B package design approval certificate.

18.2.3. Type B(M) package shipment approval certificate.

18.2.4. Fissile material package design approval certificate.

18.2.5. Fissile material package shipment approval certificate.

18.2.6. Special arrangement approval certificate.

18.2.7. Any similar documents.

Key 19. Additional Handling Information. Enter:

19.1. The PSN, hazard class, and net quantity of each secondary hazard for items with multiple hazards.

19.2. Handling instructions, when specified by a packaging paragraph. Only enter if the handling instruction applies to the material being shipped.

19.3. Enter the 24-hour Emergency Response number for the hazardous material listed on the Shipper's Declaration for Dangerous Goods. See paragraph **A17.2.10.3.** for Emergency Response numbers used by DOD activities.

19.4. The control and emergency temperatures for temperature controlled Class 4.1 and 5.2 materials.

Key 20. Name/Job Title of Signatory. Enter the name and job title of the official signing the form. Military rank is not considered a job title, but may be included.

Key 21. Place and Date. Enter the place and date the material was certified (i.e., Hill AFB, 1 Jan 97).

Key 22. Signature. The official who certifies that the shipment complies with the requirements of this instruction must sign the form. Signature may be either written manually, by mechanical entry, or by a digital method.

Figure A17.2. Determining Certification Requirements for Class 7.

Step 1. Determine the radionuclide and type of package. Turn to **A11.3.** Find the radionuclide, its name, and the maximum radioactive quantity (TBq or Ci) that can be shipped in a type A package. If a type B container is required, go to Step 3.

Step 2. Determine if a Shipper's Declaration for Dangerous Goods is Required. Turn to **Table A11.7.** Determine the maximum quantity that can be shipped as a limited quantity. This amount will be a fraction of the quantity listed in **Table A11.1.** If the item shipped qualifies as an excepted package, a Shipper's Declaration for Dangerous Goods is not required, but you must comply with **A11.10.** and **A11.11.** Go to Step 3 if the material is not a limited quantity.

Step 3. Enter the Information Required in Key 16. Make a note of the transport index, but do not enter it in Key 16.

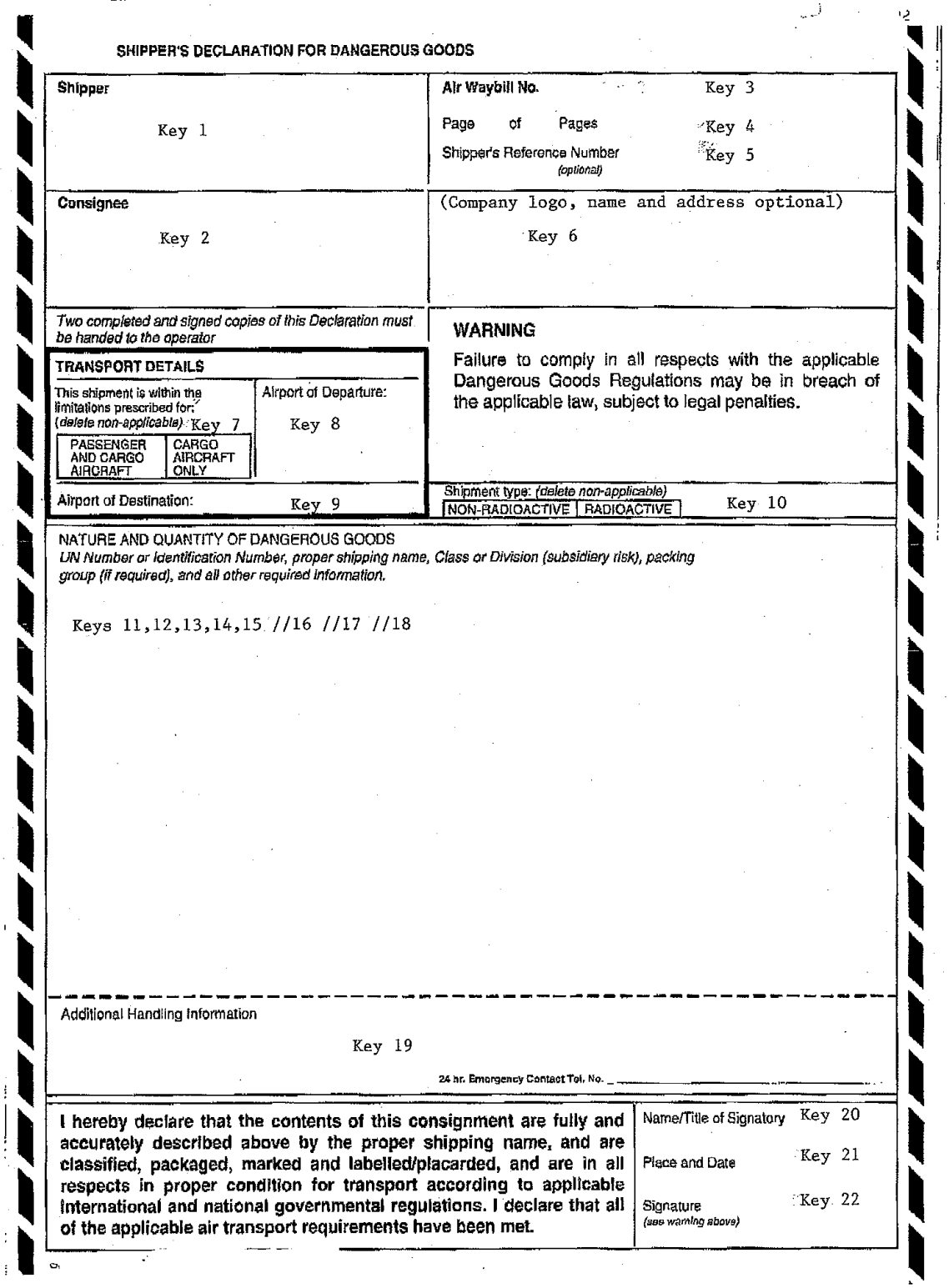
Step 4. Determine the Proper Shipping Name (PSN). Select the applicable PSN from **Table A4.1.** Complete the appropriate keys using the information found in **Table A4.1.**, columns 2 through 4. Do not complete Key 17 at this point. Make a note of all the basic paragraphs listed in column 8.

Step 5. Select the Packaging Paragraph. Determine the correct packaging paragraph from the list you made in Step 4 based on the type of package used. Determine the paragraph based on the particular container used. Enter this information as the first entry in Key 17.

Step 6. Determine the Label Requirements. Use the transport index, the surface reading, and fissile class, if appropriate, to determine the labels required by **Attachment 15**. Enter the label required as the category of package entry in Key 17, immediately following the packaging paragraph. Enter the transport index and any remaining information required to complete Key 17.

Step 7. Complete the Remaining Keys of the Shipper's Declaration for Dangerous Goods. Step-by-step instructions for completing the Shipper's Declaration for Radioactive Material are identified in **Figure A17.1.**

Figure A17.3. Completed Samples of the Shipper's Declaration for Dangerous Goods.



SHIPPER'S DECLARATION FOR DANGEROUS GOODS

Shipper Key 1	**Air Waybill No.** Key 3 Page of Pages Key 4 Shipper's Reference Number (optional) Key 5
Consignee Key 2	(Company logo, name and address optional) Key 6
Two completed and signed copies of this Declaration must be handed to the operator	**WARNING** Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: *(delete non-applicable)* Key 7

PASSENGER AND CARGO AIRCRAFT | CARGO AIRCRAFT ONLY

Airport of Departure: Key 8

Airport of Destination: Key 9

Shipment type: *(delete non-applicable)* NON-RADIOACTIVE | RADIOACTIVE Key 10

NATURE AND QUANTITY OF DANGEROUS GOODS

UN Number or Identification Number, proper shipping name, Class or Division (subsidiary risk), packing group (if required), and all other required information.

Keys 11,12,13,14,15 //16 //17 //18

Additional Handling Information

Key 19

24 hr. Emergency Contact Tel. No. _____

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met.

Name/Title of Signatory Key 20

Place and Date Key 21

Signature *(see warning above)* Key 22

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

SHIPPER Key 1 PHONE NUMBER: DSN:	AIR WAYBILL NO. Key 3 PAGE OF PAGES Key 4 SHIPPER'S REFERENCE NUMBER Key 5 TCN:
CONSIGNEE Key 2	Key 6
COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR	**WARNING** Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties
TRANSPORTATION DETAILS THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR: (DELETE NON-APPLICABLE) Key 7 PASSENGER AND CARGO AIRCRAFT / CARGO AIRCRAFT ONLY AIRPORT OF DEPARTURE: Key 8	SHIPMENT TYPE: (DELETE NON-APPLICABLE) NON-RADIOACTIVE / RADIOACTIVE
AIRPORT OF DESTINATION: Key 9	

NATURE AND QUANTITY OF DANGEROUS GOODS

DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE of PACKING	PACKING INSTRUCTION	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
Key 11	Key 12	Key 13/14	Key 15	Key 16	Key 17	Key 18

ADDITIONAL HANDLING INFORMATION

Key 19

EMERGENCY TELEPHONE NUMBER:

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.

NAME/TITLE OF SIGNATORY Key 20

PLACE AND DATE Key 21

SIGNATURE *(see warning above)* Key 22

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

SHIPPER
TRAFFIC MANAGEMENT FLIGHT
5236 CHASE ST
WRIGHT PATTERSON AFB OH 45433-5501

PHONE NUMBER:
(793) 257-4409 DSN: 787-4409

AIR WAYBILL NO.

PAGE 1 OF 1 PAGES

SHIPPER'S REFERENCE NUMBER
TCN: FB2300618090O1XXX

CONSIGNEE
FB5612
435 ABW LRS
RAMSTEIN AB, GERMANY

COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR

WARNING

Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties

TRANSPORTATION DETAILS

THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR: (DELETE NON-APPLICABLE)

PASSENGER AND CARGO AIRCRAFT

~~CARGO AIRCRAFT ONLY~~

AIRPORT OF DEPARTURE:
DOV
DOVER AFB, DE

AIRPORT OF DESTINATION:
RAMSTEIN AB, GERMANY

SHIPMENT TYPE: (DELETE NON-APPLICABLE)

NON-RADIOACTIVE

~~RADIOACTIVE~~

NATURE AND QUALITY OF DANGEROUS GOODS

DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE of PACKING	PACKING INST	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
UN3166	ENGINES, INTERNAL COMBUSTION	9		1 DIESEL GENERATOR	A13.5	

ADDITIONAL HANDLING INFORMATION
DIESEL FUEL, 3, 500 ML
BATTERY, WET FILLED WITH ACID, 8, 5 LITERS

EMERGENCY TELEPHONE NUMBER: 1-800-851-8061/1-804-279-3131

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.

NAME/TITLE OF SIGNATORY
Alex Lucente
Warehouse Supervisor

PLACE AND DATE
WPAFB, OH. 45433 3 Jan 2007

SIGNATURE
(see warning above)

AMC IMT 1033, 20050204, V1

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

SHIPPER
TRAFFIC MANAGEMENT FLIGHT
5236 CHASE ST
WRIGHT-PATTERSON AFB, OH, 45433-5501

PHONE NUMBER:
(793) 257-4409 DSN: 787-4409

AIR WAYBILL NO.

PAGE 1 OF 1 PAGES

SHIPPER'S REFERENCE NUMBER
TCN: FB230061809001XXX

CONSIGNEE
FB5612
435 ABW/LRS
RAMSTEIN AB, GERMANY

COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR

WARNING

Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties

TRANSPORTATION DETAILS

THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR:
(DELETE NON-APPLICABLE)

PASSENGER AND CARGO AIRCRAFT

~~CARGO AIRCRAFT ONLY~~

AIRPORT OF DEPARTURE:
DOV
DOVER AFB, DE

AIRPORT OF DESTINATION:
RAMSTEIN AB, GERMANY

SHIPMENT TYPE: (DELETE NON-APPLICABLE)

NON-RADIOACTIVE

~~RADIOACTIVE~~

NATURE AND QUALITY OF DANGEROUS GOODS

DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE of PACKING	PACKING INST	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
UN1950	AEROSOLS	9		1 Fiberboard Box (4G) X 5.1 kg	A6.2	

ADDITIONAL HANDLING INFORMATION

EMERGENCY TELEPHONE NUMBER: 1-804-279-3131/1-800-851-8061

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.

NAME/TITLE OF SIGNATORY
COURTNEY M. FERGUSON
Hazardous Material Packaging Specialist

PLACE AND DATE
WPAFB, OH 45433 3 Jan 2007

SIGNATURE
(see warning above)

AMC IMT 1033, 20050204, V1

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

SHIPPER
TRAFFIC MANAGEMENT FLIGHT
5236 CHASE ST
WRIGHT PATTERSON AFB OH 45433-5501

PHONE NUMBER:
(793) 257-4409 DSN: 787-4409

AIR WAYBILL NO.

PAGE 1 OF 1 PAGES

SHIPPER'S REFERENCE NUMBER
TCN: FB230061809001XXX

CONSIGNEE
FB5612
435 ABW LRS
RAMSTEIN AB, GERMANY

COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR

WARNING

Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties

TRANSPORTATION DETAILS

THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR: (DELETE NON-APPLICABLE)

PASSENGER AND CARGO AIRCRAFT

~~CARGO AIRCRAFT ONLY~~ XXXXXXXXXXXX

AIRPORT OF DEPARTURE:
DOV
DOVER AFB, DE

SHIPMENT TYPE: (DELETE NON-APPLICABLE)

NON-RADIOACTIVE ~~RADIOACTIVE~~

AIRPORT OF DESTINATION:
RAMSTEIN AB, GERMANY

NATURE AND QUALITY OF DANGEROUS GOODS

DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE of PACKING	PACKING INST	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
UN3072	LIFE-SAVING APPLIANCE NOT SELF INFLATING	9		1 Fiberboard Box X 5 Kg	A13.12	

ADDITIONAL HANDLING INFORMATION

Store in cool, well-ventilated areas away from fire hazards and sources of heat or ignition. Do not drop or rough handle.

FLARES, AERIAL, 1.3G 2.5 grams
MATCHES, STRIKE ANYWHERE, 4.1, 2 grams

EMERGENCY TELEPHONE NUMBER: 1-800-851-8061 /1-804-279-3131

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.

NAME/TITLE OF SIGNATORY
Caroline Heinz
Packing & Crating Supervisor

PLACE AND DATE
WPAFB, OH. 45433 3 Jan 2007

SIGNATURE
(see warning above)

AMC IMT 1033, 20050204, V1

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

SHIPPER
TRAFFIC MANAGEMENT FLIGHT
5236 CHASE ST
WRIGHT PATTERSON AFB OH 45433-5501

PHONE NUMBER:
(793) 257-4409 DSN: 787-4409

AIR WAYBILL NO.

PAGE 1 OF 1 PAGES

SHIPPER'S REFERENCE NUMBER
TCN: FB230061809001

CONSIGNEE
FB5612
435 ABW LRS
RAMSTEIN AB, GERMANY

COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR

WARNING

Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties

TRANSPORTATION DETAILS

THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR:
(DELETE NON-APPLICABLE)

PASSENGER AND CARGO AIRCRAFT

~~CARGO AIRCRAFT ONLY~~

AIRPORT OF DEPARTURE:
DOV
DOVER AFB, DE

AIRPORT OF DESTINATION:
RAMSTEIN AB, GERMANY

SHIPMENT TYPE: (DELETE NON-APPLICABLE)

NON-RADIOACTIVE

~~RADIOACTIVE~~

NATURE AND QUALITY OF DANGEROUS GOODS

DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE of PACKING	PACKING INST	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
UN1072	OXYGEN, COMPRESSED	2.2 (5.1)		8 Cylinders X 9.39 Kg	A6.5	

ADDITIONAL HANDLING INFORMATION

EMERGENCY TELEPHONE NUMBER: 1-800-851-8061 /1-804-279-3131

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.

NAME/TITLE OF SIGNATORY
Tony Davis
Cargo Movement Supervisor

PLACE AND DATE
WPAFB, OH. 45433 3 Jan 2007

SIGNATURE
(see warning above)

AMC IMT 1033, 20050204, V1

Attachment 18

COMPATIBILITY

A18.1. General Requirements. Packages containing hazardous materials that might react dangerously with one another must not be loaded or transported in a position that would allow interaction between the material in the event of leakage. Segregation requirements for hazardous material on military aircraft identified in **Table A18.1.** and **Table A18.2.** must be used to determine segregation requirements.

A18.1.1. **Table A18.1.** details segregation requirements for all hazardous materials.

A18.1.2. **Table A18.2.** specifies compatibility requirements for Class 1.

A18.1.3. **A18.4.** specifies compatibility requirements for tactical and contingency operations under the authority of **Chapter 3**.

A18.2. Segregation Requirements for All Hazardous Materials. Table A18.1. indicates the explosives and other hazardous materials that must not be loaded, transported, or stored together.

A18.2.1. Only the primary hazard class or division are considered for segregation. Subsidiary-risks and secondary hazards will not be used to determine segregation requirements when using **Table A18.1.**

A18.2.2. The absence of any hazard class or a blank space in the table indicates that no restrictions apply.

A18.2.3. The letter "X" at an intersection of horizontal and vertical columns indicates that these articles must not be loaded, transported , or stored together. For example, in **Table A18.1.**, Class 3 flammable liquids, must not be loaded, transported, or stored with Class 1.1.

A18.2.4. The letter "O" at an intersection of horizontal and vertical columns indicates that these articles must not be loaded, transported, or stored together unless separated by a distance of 2.2 m (88 inches) in all directions. For example, in **Table A18.1.**, Class 8 corrosive liquids, must not be loaded, transported, or stored with Class 4.1 flammable solids unless separated by 2.2 m (88 inches) in all directions.

A18.2.5. The "*" at an intersection of horizontal and vertical columns indicates that segregation among different Class 1 materials is identified in **Table A18.2.**

A18.2.6. Be sure to check notes for compatibility.

A18.3. Segregation Requirements for Class 1 Materials. Table A18.2. identifies Class 1 materials that must not be loaded, transported, or stored together.

A18.3.1. A blank space in the table indicates that no restrictions apply.

A18.3.2. The letter "X" at an intersection of horizontal and vertical columns shows that these articles must not be loaded or stored together. For example, do not load or store Class 1.2C with Class 1.2H.

A18.3.3. Unless otherwise authorized, do not pack explosives in the same outer packaging with other articles. Explosives of the same compatibility group or authorized combination of compatibility groups but a different class number may be packed together, provided that the whole package is treated as though its entire contents were comprised of the lower class number (higher hazard). For

example, treat a mixed package of Class 1.2D explosives and Class 1.4D explosives as Class 1.2D explosives. However, when Class 1.5D is packed together with Class 1.2D, treat the whole package as Class 1.1D (for compatibility).

A18.3.4. Incompatible explosives may be packed together when approved according to TB 700-2/ NAVORDINST 8020.8B/TO 11A-1-47/DLAR 8220.1, *DOD Explosive Hazard Classification Procedures* or paragraph **2.3.2.**

A18.3.5. Subsidiary-risks will not be used to determine compatibility requirements when using **Table A18.2.**

A18.3.6. Be sure to check notes for compatibility.

A18.4. Chapter 3 Segregation/Compatibility. The requirements of **Table A18.1.** and **Table A18.2.** may be deviated from when transporting cargo approved to be airlifted using provisions of **Chapter 3**, consistent with operational requirements. Normally incompatible hazardous materials may be transported on the same aircraft when separated to the maximum extent possible. Compatibility waivers are not required. Use **Chapter 3** segregation/compatibility, to include complete round rigging, for exercises only when there is an intent to use or fire explosives and ammunition. The following restrictions are mandatory:

A18.4.1. Explosives in compatibility groups A, J, K, and L can only be shipped with material in compatibility group S and Class 9.

A18.4.2. Fissile class III radioactive materials (Class 7) cannot be loaded, transported, or stored on the same aircraft with any other hazardous material.

A18.4.3. Class 1.1, 1.2, and 1.3 cannot be shipped with any Inhalation hazard zone A material .

A18.4.4. Class 1.1, 1.2, and 1.3 cannot be shipped with Class 6.1 poisonous liquids, PG I.

A18.4.5. Cyanides or cyanide mixtures (Class 6.1) cannot be loaded, transported, or stored with any corrosive Class 8 material.

Table A18.1. Segregation Table for Hazardous Materials.

Class or Division Note 7 Note 10	**Notes**	**1.1 1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**2.1**	**2.2**	**2.3 Gas Zone A**	**2.3 Gas Other than Zone A**	**3**	**4.1**	**4.2**	**4.3**	**5.1**	**5.2**	**6.1 Liquid PG I Zone A**	**7**	**8 Liquid Only**
Notes		16					9								1		4	23	4, 5 6, 7, 8
1.1 and 1.2	16	*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	X	X
1.3		*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	0	X
1.4		*	*	*	*	*	0		0	0	0		0				0		0
1.5		*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
1.6		*	*	*	*	*													
2.1	9	X	X	0	X				X	0			0	0	0	0	0	0	0
2.2					X														
2.3 Zone A		X	X	0	X		X				X	X	X	X	X	X			X
2.3 Other than Zone A		X	X	0	X		0				0	0	0	0	0	0			0
3		X	X	0	X				X	0		0	0	0	0	0	X		
4.1		X	X		X				X	0	0						X		0
4.2		X	X	0	X		0		X	0	0						X		X
4.3		X	X		X		0		X	0	0						X		0
5.1	1	X	X		X		0		X	0	0						X		0
5.2		X	X		X		0		X	0	0						X		0
6.1 Liquid PG I Zone A	4	X	X	0	X		0				X	X	X	X	X	X			X
7	23	X	0		X		0												
8 Liquid Only	4 5 6 7 8	X	X	0	X		0		X	0		0	X	0	0	0	X		

NOTES:

1. Ammonium nitrate fertilizer may be loaded, transported, or stored with Class 1.1 or 1.5 materials.
2. Do not load, transport, or store fissile class III radioactive material (Class 7) on the same aircraft with any other hazardous material.
3. Normal uranium, depleted uranium, and thorium metal in solid form radioactive materials (Class 7) may be loaded and transported with Class 1.1, 1.2, and 1.5 (explosives).
4. Do not load, transport, or store cyanides or cyanide mixtures (Class 6.1) with any Class 8 materials.
5. Separate nitric acid (Class 8) in carboys by 2.2 m (88 inches) in all directions from other corrosives materials in carboys when loaded on the same aircraft.
6. Do not load, transport, or store charged electric storage batteries (Class 8) on the same aircraft with any Class 1.1 or 1.2.
7. Ship the following materials with each other and with all other hazardous materials without compatibility restrictions (ensure compliance with notes 4, 5, and 6):
   7.1. Class 6.1 toxic solids and liquids (other than PG I, zone A) See Note 4 concerning restrictions for cyanides or cyanide mixtures.
   7.2. Class 8 solids
   7.3. Class 9 (including ORM-D)
   7.4. Excepted Quantities
   7.5. Containers or articles drained but not purged containing 500 ml (17 oz) or less of Class 3
8. Class 8 corrosive liquids must not be loaded above or adjacent to Class 4 (flammable solid) material or Class 5 (oxidizing) material.
9. Class 2.1 aerosol cans may be shipped with other incompatible items when separated in all directions by a minimum of 88 inches.
10. Items classified by a predominate hazard other than Class 1 but contain small amounts of explosive materials and assigned an explosive compatibility letter for storage may be shipped with Class 1 material according to **Table A18.2.** For example Class 4.2G may be shipped with Class 1.3G.

Table A18.2. Compatibility Table for Class 1 (Explosive) Materials.

Compatibility Group	A	B	C	D	E	F	G	H	J	K	L	N	S
NOTES A		X	X	X	X	X	X	X	X	X	X	X	X
B 1, 2,	X		X	X	X	X	X	X	X	X	X	X	
C	X	X				X	X	X	X	X	X		
D	X	X				X	X	X	X	X	X		
E	X	X				X	X	X	X	X	X		
F 3	X	X	X	X	X		X	X	X	X	X	X	
G 4, 5, 7	X	X	X	X	X	X		X	X	X	X	X	
H	X	X	X	X	X	X	X		X	X	X	X	
J	X	X	X	X	X	X	X	X		X	X	X	
K	X	X	X	X	X	X	X	X	X		X	X	
L 6	X	X	X	X	X	X	X	X	X	X		X	X
N	X	X				X	X	X	X	X	X		
S 7	X										X		

NOTES:

1. Group "B" explosives UN 0255, 0257, UN0267, and UN0361 may be loaded and transported with groups "C," "D," and "E" explosives.
2. Group "B" explosives packaged in an EOD MK 663, MOD O container may be loaded and transported with groups "C" through "H" and group "S" explosives.
3. Group "F" explosives UN 0292 may be loaded and transported with groups "C," "D," and "E" explosives.
4. Group "G" explosives UN 0019, UN 0300, UN 0301, and UN 0325 may be loaded and transported with all other explosives compatible with group "S" explosives.
5. Group "G" explosives UN 0009, UN 0018, UN 0314, UN 0315, UN 0317, UN 0319, and UN 0320 may be transported with groups "C," "D," and "E" explosives.
6. Group "L" explosives must only be loaded and transported with an identical item.
7. Class 1.1 and 1.2 explosives may not be shipped with UN 0333, UN 0334, UN 0335, UN 0336, and UN 0337.

A18.5. Classification Codes and Compatibility Groups of Explosives. The classification code for an explosive consists of the class number followed by the compatibility group letter. Compatibility group letters are used to specify the controls required for transportation and storage and to prevent the additional hazard that might occur if certain types of explosives are transported or stored together. All explosives

entering the Defense Transportation System must be assigned a final or interim hazard classification according to **A3.3.1.4.** Compatibility groups and classification codes for the various types of explosive substances and articles are identified in **Table A18.3.** Compatibility groups assigned to non-class 1 items are used for permanent storage and do not apply while item is in the Defense Transportation System.

Table A18.3. Classification Codes.

Description of Substances or Article to be Classified	Compatibility Group	Classification Code
Primary explosive substance	A	1.1A
Article containing a primary explosive substance and not containing two or more effective protective features	B	1.1B 1.2B 1.4B
Propellant explosive substance or other deflagrating explosive substance or article containing such explosive substance	C	1.1C 1.2C 1.3C 1.4C
Secondary detonating explosive substances or black powder or article containing a secondary detonating explosive substance, in each case without means of initiation and without a propelling charge, or article containing a primary explosive substance and containing two or more effective protective features	D	1.1D 1.2D 1.4D 1.5D
Article containing a secondary detonating explosive substance, without means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid)	E	1.1E 1.2E 1.4E
Article containing a secondary detonating explosive substance with its means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid) or without propelling charge.	F	1.1F 1.2F 1.3F 1.4F
Pyrotechnic substance or article containing a pyrotechnic substance, or article containing both an explosive substance and illuminating, incendiary, tear-producing or smoke producing substance (other than a water-activated article or one containing white phosphorus, phosphide or flammable liquid or gel or hypergolic liquid.	G	1.1G 1.2G 1.3G 1.4G

Description of Substances or Article to be Classified	Compatibility Group	Classification Code
Article containing both an explosive and white phosphorus	H	1.2H 1.3H
Article containing both an explosive substance and flammable liquid or gel	J	1.1J 1.2J 1.3J
Article containing both an explosive substance and a toxic chemical agent	K	1.2K 1.3K
Explosive substance or article containing an explosive substance and presenting a special risk (e.g., due to water-activation or presence of hypergolic liquids phosphides or pyrophoric substances) needing isolation of each type.	L	1.1L 1.2L 1.3L
Articles containing only extremely insensitive detonating substances	N	1.6N
Substance or article so packed or designed that any hazardous effects arising from accidental functioning are limited to the extent that they do not significantly hinder or prohibit fire fighting or other emergency response efforts in the immediate vicinity of the package.	S	1.4S

Attachment 19

EXCEPTED AND LIMITED QUANTITIES

A19.1. Quantities. Excepted and limited quantities are authorized on military aircraft according to paragraph **2.7.** These small quantities of hazardous materials are exempted from certain requirements of this manual as identified in this attachment. The provisions in this attachment do not apply to radioactive materials. See **Attachment 11** for requirements applicable to radioactive material in accepted packaging or limited quantity of material.

A19.2. Excepted Quantities. Small quantities of hazardous materials are exempt from the specification packaging, marking, labeling, certification and compatibility requirements of this manual if the provisions of this paragraph are met.

A19.2.1. Do not ship the following material as an excepted quantity:

A19.2.1.1. Class 1 material.

A19.2.1.2. Class 2, division 2.1 and 2.3; or division 2.2 material having a subsidiary risk.

A19.2.1.3. Material having a primary or subsidiary risk of Class 4 in PG I.

A19.2.1.4. Class 4.1 self-reactive material.

A19.2.1.5. Material having a primary or subsidiary risk of Class 5 in PG I.

A19.2.1.6. Material having a primary or subsidiary risk of Class 6.1, in PG I, by reason of inhalation toxicity.

A19.2.1.7. Class 6.2 material.

A19.2.1.8. Class 7 material.

A19.2.1.9. Material having a primary or secondary risk of Class 8 in PG I, UN2803 and UN2809.

A19.2.1.10. Magnetized material (Class 9).

A19.2.1.11. Hazardous material contained within a device that is a component part of an otherwise nonhazardous item (except for temperature sensing devices) such as mercury switches in electrical equipment. Prepare the hazardous material according to the requirements for the hazard. If the material is not regulated as a hazardous material, ship the item as general cargo.

A19.2.1.12. Material identified as “Cargo Aircraft Only” in **Table A4.1.**

A19.2.2. Maximum Net Quantity for Excepted Quantities. The maximum net quantity of hazardous material that is allowed in each inner packaging and the total net quantity allowed in each outer packaging are given in **Table A19.1.** Refer to **A19.2.1.** to determine if the material qualifies for the excepted quantities provision and that **Table A19.1.** is applicable. If the quantity limitations of **Table A19.1.** are exceeded, the excepted quantity provision must not be used and the material must be prepared according to the requirements for the individual material.

Table A19.1. Excepted Quantity Limits for Inner and Outer Packaging.

Class of Primary or Subsidiary Risk	Packing Group	Quantity Limits	
		Inner Packagings	Outer Packagings
2.2	See (note 1) and (note 2)	See (note 1) and (note 2)	See (note 1) and (note 2)
3	Packing Group II and III	30 mL	PG II 500 mL PG III 1 L
4	Packing Group II and III	30 mL or 30 g	PG II 500 g or 500 mL PG III 1 kg or 1 L
5 (note 3)	Packing Group II and III	30 mL or 30 g	PG II 500 g or 500 mL PG III 1 kg or 1 L
6	Packing Group I, II and III	PG I 1g or 1 mL PG II 1g or 1 mL PG III 30g or 30 mL	PG I 300g or 300 mL PG II 500g or 500 mL PG III 1 kg or 1 L
8	Packing Group II and III	30 mL or 30 g	PG II 500 g or 500 mL PG III 1 kg or 1 L
9 (note 4)	Packing Group II and III	30 mL or 30 g	PG II 500 g or 500 mL PG III 1 kg or 1 L

NOTES:

1. Packing groups are not used for this hazard class.
2. For inner packaging, the quantity contained in each receptacle must not exceed a water capacity of 30 ml. For outer packaging, the sum of the water capacities of all the inner packaging must not exceed 1 L.
3. Applies only to organic peroxides when contained in a chemical kit or a first aid kit.
4. For Class 9 material, if no PG is given in **Table A4.1.**, PG II quantities must be used.

A19.2.3. Inner Packaging. Each inner packaging must be plastic (with a minimum thickness of 0.2 mm), glass, earthenware, or metal. The inner packaging must not react with, or be decomposed by, the material contained therein.

A19.2.4. Closures. Closures must be held securely, tightly, and effectively in place with tape, self-shrink plastic, wire, or other positive means.

A19.2.5. Liquids. Liquids must not completely fill inner packaging at a temperature of 55 degrees C (130 F).

A19.2.6. Intermediate Packaging. Securely pack each inner packaging in an intermediate packaging with cushioning material. The intermediate packaging must completely contain the contents in case of breakage or leakage, regardless of packaging orientation. For liquid hazardous material, the intermediate packaging must contain sufficient absorbent cushioning material to absorb the entire contents of the inner packaging.

A19.2.7. Outer Packaging. Securely pack the intermediate packaging in a strong, rigid, outer packaging (i.e., fiberboard, wood).

A19.2.8. Overpacks. Overpacks may be used and may contain packages of nonhazardous material. All material in the same outer packaging and overpack must be compatible.

A19.2.9. Dimensions of Outer Package. Two of three outside dimensions of the outer package must measure at least 100 mm (4 inches). If the outer package is in the shape of a cylinder, it must have a minimum height and diameter of 100 mm (4 inches) each.

A19.2.10. Other Hazardous Materials and Materials in Excepted Quantities. A package containing hazardous material in excepted quantities must not contain other hazardous material that are regulated by this manual (requires a Shipper's Declaration for Dangerous Goods).

A19.2.11. Different Materials in One Outer Packaging. When different hazardous materials are contained in one outer packaging, use the formula listed below to determine the quantities that can be included in one outer packaging. The quantities of different hazardous materials contained in each outer packaging must be such that "Q" is less than or equal to 1.0, "Q" is calculated using the formula:

$$nl/Ml + n2/M2 + n3/M3 \ldots = Q$$

(nl, n2, etc. is the actual net quantity of each different hazardous material. Ml, M2, etc. is the maximum net quantity permitted for the material and packing group in the outer packaging according to **Table A19.1.**) For example:

A19.2.11.1. There are 15 inner packages at 20 ml each of Class 3, PG II , and 5 inner packages at 30 ml each of Class 8, PG II in one outer packaging: 300 ml/500 ml + 150 ml/500 ml = 0.6 + 0.3 = 0.9. The result is less than 1.0, so the material can be shipped in one outer packaging.

A19.2.11.2. There are 5 inner packages at 30 ml each of Class 3, PG II, and 15 inner packages at 30 g each of Class 8, PG II in one outer packaging: 150 ml/500 ml + 450 g/500 g = 0.3 + 0.9 = 1.2. The result is greater than 1.0, so the item can not be shipped in one outer packaging.

A19.2.12. Package Performance Tests. The complete package (inner plus outer packaging), must be capable of withstanding the test specified in **A19.2.12.1.** without breakage or leakage of the inner packaging and without significant reduction in effectiveness. Tests must be carried out on the packaging prepared as for transport. Inner receptacles must contain at least 95 percent of their capacity for solids and 98 percent of their capacity for liquids. The material to be transported in the packaging may be replaced by another material, except where this would invalidate the results of the tests. When another material is substituted for a solid, the material must have the same physical characteristics (i.e., mass, grain size) as the material to be shipped. When another material is substituted in the drop test for liquids, its relative density (specific gravity) and viscosity shall be similar to the material to be shipped.

A19.2.12.1. For packaging with six sides (i.e., fiberboard box), the following free drops onto a solid, unyielding, flat, and horizontal surface from 1.8 m (6 ft) is required. Each test may be performed on different but identical containers.

A19.2.12.1.1. One drop flat on the bottom.

A19.2.12.1.2. One drop flat on the top.

A19.2.12.1.3. One drop flat on the long side.

A19.2.12.1.4. One drop flat on the short side.

A19.2.12.1.5. One drop on a corner at the junction of three intersecting edges.

A19.2.12.2. For cylindrical packaging, the following free drops onto a solid, unyielding flat and horizontal surface from 1.8 m (6 ft) is required:

A19.2.12.2.1. One drop diagonally on chime or circumferential seam edge.

A19.2.12.2.2. One drop on the weakest part (i.e., a closure) not tested by the first drop.

A19.2.12.3. A force applied to the top surface for a duration of 24 hours, equivalent to the weight of identical packages if stacked to a height of 3 m (10 ft), including the test sample.

A19.3. Dangerous Goods in Limited Quantities. Limited quantities may be certified to this paragraph or to the most current ICAO or IATA. Comply with all requirements of the document used including the inner packaging and outer packaging quantity limits. Pack limited quantities in good quality combination packagings using only the inner and outer packaging combinations authorized. The packagings must also meet the general packaging requirements of **Attachment 3**. Single packagings, including composite packagings, are not permitted. The gross weight of a "limited quantity" package must not exceed 30 Kg (66 pounds). Quantity limits must not exceed the amounts authorized by **Table A19.2.** If all the requirements of this paragraph and the quantity limits of **Table A19.2.** are met, the combination packaging need not meet (or be marked) with the UN packaging specification requirements.

A19.3.1. Dangerous Goods not Permitted in Limited Quantities:

A19.3.1.1. Materials forbidden in **Table A4.1.**

A19.3.1.2. Materials identified as "Cargo Aircraft Only" in **Table A4.1.**

A19.3.1.3. All materials in PG I.

A19.3.1.4. Class 1 and 7 materials.

A19.3.1.5. Class 2.3 and 6.2.

A19.3.1.6. Class 2.1 materials (other than aerosols).

A19.3.1.7. Refrigerated liquefied gases.

A19.3.1.8. Class 4.1 self-reactive substances.

A19.3.1.9. Class 4.2 or any material with a subsidiary risk of 4.2.

A19.3.1.10. Materials with UN numbers of 2794, 2795, 2803, 2809 or 3028.

A19.3.1.11. Class 9 materials except those specifically authorized in **A19.3.2.**

A19.3.2. Dangerous Goods Permitted in Limited Quantities:

A19.3.2.1. Aerosols of Class 2.1 and 2.2.

A19.3.2.2. Gases of Class 2.2 without a subsidiary risk (excluding refrigerated liquefied gases).

A19.3.2.3. Class 3 (excluding PG I).

A19.3.2.4. Class 4.1 (excluding PG I and Class 4.1 self-reactive substances).

A19.3.2.5. Class 4.3 solids only (excluding PG I).

A19.3.2.6. Class 5.1 (excluding PG I).

A19.3.2.7. Class 5.2 only when contained in a "Polyester Resin Kit (UN 3269)," Chemical Kit (NA 1760)" or "First Aid Kit (" (excluding PG I).

A19.3.2.8. Class 6.1 (excluding PG I).

A19.3.2.9. Class 8 (excluding PG I, UN2794, UN2795, UN2803, UN2809 and UN3028).

A19.3.2.10. Only the following items of Class 9: Ammonium Nitrate Fertilizers (UN2071), Benzaldehyde (UN1990), Environmentally Hazardous Substance Solid N.O.S. (UN3077), Environmentally Hazardous Substance Liquid N.O.S. (UN3082), Chemical Kit or First Aid Kit (UN3316) and Dibromodifluoromethane (UN1941).

A19.3.3. Different Dangerous Goods in Limited Quantities in one Package. When different dangerous goods in limited quantities are packed together in one outer packaging, the quantities must be as follows:

A19.3.3.1. Class 3 and 8, and Class 4.1, 4.3 (solid), 5.1, 5.2, and 6.1 must not exceed the lowest net quantity per package (of the most restrictive single material in the package) as listed in **Table A19.2.** For calculation purposes, when a package contains both liquid and solids, convert the quantities for the liquids into kilograms in order to determine that the permitted maximum net quantity per package has not been exceeded. The "Q" value formula is not applicable for limited quantities.

A19.3.3.2. Class 2 and 9, when packed without any other dangerous goods, the gross weight of the package must not exceed 30 Kg (66 pounds).

A19.3.3.3. Class 2 and 9, when packed with other dangerous goods, must meet the requirements of **A19.3.3.2.** In addition, the maximum net quantity of all the other dangerous goods (other than class 2 and 9) must not exceed the requirements of **A19.3.3.1.**

A19.3.4. Package Performance Tests. Limited quantity packages must meet the following test requirements:

A19.3.4.1. The package, as prepared for transport, must be capable of withstanding a 1.2 m (4 ft) drop test onto a rigid, nonresilient, flat, horizontal surface, in a position most likely to cause the most damage. After the test, the package must not show any damage that is likely to affect safety during transport and there must be no leakage from the inner packagings.

A19.3.4.2. Each package offered for transport must be capable of withstanding a force applied to the top surface of the package (for a duration of 24 hours) equivalent to the total weight of identical packages if stacked to a height of 3 m (9.8 ft). The stack height includes the test sample. There cannot be any significant reduction in the package's effectiveness and there cannot be any breakage or leakage of any inner packaging.

A19.3.4.3. Liquids must meet air-eligible requirements of **A3.2.**

Table A19.2. Limited Quantity Limits - Classes 2 – 9.

Class or Division	Packing Group	Physical State	Inner Packaging	Per Package
2	--	Gas (note 2)	120 mL (note 3)	30 kg G
3	II	Liquid	500 mL	1 L
	III	Liquid	5 L	10 L
4.1	II	Solid	500 g	5 kg
	III	Solid	1 kg	10 kg
4.3	II	Solid	500 g	5 kg
	III	Solid	1 kg	10 kg
5.1	II	Liquid	100 mL	500 mL
	II	Solid	500 g	2.5 kg
	III	Liquid	500 mL	1 L
	III	Solid	1 kg	10 kg
5.2	--	Liquid	30 mL	500 mL
	--	Solid	100 g	1 kg
6.1	II	Liquid	100 mL	1 L
	II	Solid	500 g	1 kg
	III	Liquid	500 mL	2 L
	III	Solid	1 kg	10 kg
8 (note 1)	II	Liquid	100 mL	500 mL
	II	Solid	500 g	5 kg
	III	Liquid	500 mL	1 L
	III	Solid	1 kg	5 kg
9 (note 1)	III	Liquid/Solid	5 L	30 kg G

NOTES:

1. Chemical or First Aid Kits: In inner receptacles of no more than 30 ml for liquids or 100g for solids. The total quantity of hazardous materials in any one kit must not exceed 1 kg.
2. For gases, the quantity is the water capacity of the inner packaging.
3. Aerosols containing only a nontoxic substance or substances in inner nonrefillable metal or plastic receptacles, the capacity of the inner packaging must not exceed 1000 mL (34 fl oz).

Attachment 20

ABSORBENT CUSHIONING REQUIREMENTS

A20.1. Absorbent Material General Requirements. For combination packagings, use cushioning materials suitable for the absorption of liquid hazardous materials in the event of leakage from the primary receptacle. Ensure cushioning materials used are satisfactory in all respects. Ensure the material is not capable of reacting adversely with the contents of the package and is noncombustible. Do not use asbestos. The following requirements apply to the use of absorbent cushioning material for combination packagings containing liquid hazardous materials:

A20.1.1. Each package containing a liquid in PG I must include sufficient cushioning material to absorb the entire contents of the inner containers.

A20.1.2. Each package containing a liquid in PG II must include sufficient cushioning material to absorb the contents of any one inner container. If the inner containers vary in size, include sufficient cushioning material to absorb the contents of the inner receptacle containing the greatest quantity of liquid.

A20.1.3. Absorbent cushioning material is not required for:

A20.1.3.1. Paint in PG II

A20.1.3.2. Liquids in PG III (if inner receptacles are other than glass or earthenware)

A20.1.3.3. Consumer Commodities (if inner receptacles are other than glass or earthenware)

A20.1.4. When overpacking containers of liquids that do not meet pressure requirements into containers that meet the pressure requirement, use absorbent cushioning material as stipulated above.

A20.1.5. When absorbent cushioning material is required and/or the outer packaging is not liquid-tight, use a means of containing the liquid in the event of leakage. Use a leak-proof liner, plastic bag, or other equally
efficient means of containment specified in packaging or closure instructions according to **A3.1.1.** Thickness of liners and polyethylene bags will be as specified in test report.

A20.1.6. When the outer packaging is not liquid-tight and absorbent cushioning material is not required , use a leak-proof liner, plastic bag, or other equally efficient means of containment. When securely closed polyethylene bags are used to contain the cushioning of the hazardous liquid, the bags must be of sufficient size to form a liner for the exterior container , or a bag for the interior container. Thickness of liners and polyethylene bags will be as specified in test report.

A20.1.7. When overpacking individual packagings for consolidation that already meet air-eligibility requirements use enough cushioning material to secure and position the packagings against damage. The cushioning material, absorbent or nonabsorbent, must completely fill any void space in the container.

A20.1.8. Absorbent cushioning material is not required for containers that have met the UN packaging specification test requirements (including the hydrostatic pressure test) as a single or composite packaging.

A20.2. Determining the Amount Required. Use **Table A20.1.** as a guide to determine the amount of vermiculite or diatomaceous earth required for overpacking and cushioning liquid hazardous materials. Other equivalent cushioning materials may be used to meet **A20.1.** requirements.

A20.2.1. The amounts identified in **Table A20.1.** are the minimum requirements. When exact quantities of cushioning materials are not found in **Table A20.1.**, make an approximation based on quantities listed.

A20.2.2. When placing cushioning materials into the container, consider settling of the cushioning materials during transportation. Use enough cushioning material to compensate for any settling that may occur.

A20.2.3. When the applicable test report identifies an amount larger than **Table A20.1.**, use the amount identified in the test report.

Table A20.1. Absorbent Material Requirements in Inches.

A	B	C	D	E
If quantity is	**Then to ship use: Vermiculite, Type 1, Grade 3 (fine), or Type 1, Grade 4 (super fine)**		**Diatomaceous Earth**	
	Centimeters (inches)		**Centimeters (inches)**	
	On sides	**On top and bottom**	**On sides**	**On top and bottom**
.50 L (1 pt)	2.54 cm (1.0)	3.81 cm (1.5)	5.08 cm (2.0)	11.43 cm (4.5)
1.0 L (1 qt)	2.54 cm (1.0)	5.08 cm (2.0)	5.08 cm (2.0)	13.97 cm (5.5)
3.8 L (1 gal)	3.81 cm (1.5)	6.35 cm (2.5)	10.16 cm (4.0)	15.24 cm (6.0)
7.6 L (2 gals)	5.08 cm (2.0)	10.16 cm (4.0)	11.43 cm (4.5)	24.13 cm (9.5)
19.0 L (5 gals)	7.62 cm (3.0)	15.24 cm (6.0)	15.24 cm (6.0)	34.29 cm (13.5)
24.6 L (6.5 gals)	8.89 cm (3.5)	16.51 cm (6.5)	17.78 cm (7.0)	36.83 cm (14.5)
49.3 L (13 gals)	10.16 cm (4.0)	19.05 cm (7.5)	20.32 cm (8.0)	39.37 cm (15.5)
56.8 L (15 gals)	11.43 cm (4.5)	20.32 cm (8.0)	24.13 cm (9.5)	45.74 cm (18.0)

Attachment 21

BRIEFING AGENCY REQUIREMENTS

A21.1. Briefing Agency. This attachment outlines the information that the briefing agency is required to provide to the aircraft commander (or designated representative) according to paragraph **1.2.9.**

A21.2. Informational Requirements. The briefing agency must advise the aircraft commander (or designated representative) of:

A21.2.1. The identification number, PSN, hazard class, and PG prescribed in this manual for each hazardous material aboard the aircraft.

A21.2.2. The total quantity in weight or volume.

A21.2.3. The location of the hazardous item in the aircraft.

A21.2.4. Net explosive weight (NEW) of Class 1.1, 1.2, and 1.3 explosives, or of Class 1.4, 1.5, and 1.6 explosives when required.

A21.2.5. The requirement for escorts, couriers, and protective equipment.

A21.2.6. The number of passengers permitted aboard the aircraft.

A21.2.7. The procedures to use in an emergency when identified in Key 19 of the Shipper's Declaration For Dangerous Goods.

A21.2.8. Use of DOT SP-7573 and SP-9532 and provide copy of these special permits, as applicable to AMC contract air carriers.

A21.2.9. Transport of incompatible explosives and other hazmat approved according to paragraph **2.3.2.** Provide a copy of compatibility waiver to aircrew commander (or designated representative).

A21.3. Notification Statements. The briefing agency must include a statement on the hazardous cargo manifest when transporting hazardous materials on aircraft. Apply these statements by programmed wording, rubber stamps, or typewriter. Examples are provided below.

A21.3.1. Air terminal inspection certification statement: "ALL HAZARDOUS MATERIALS COVERED BY THIS MANIFEST HAVE BEEN INSPECTED AND FOUND TO BE PACKAGED IN THE PROPER OUTSIDE CONTAINER, FREE OF VISIBLE DAMAGE AND LEAKS, AND IS PROPERLY CERTIFIED." (Air terminal representative signature).

A21.3.2. Aircrew briefing certification statement: "I HAVE BEEN BRIEFED ACCORDING TO AFMAN 24-204 (I), PARAGRAPH **1.2.9.**, ON HAZARDOUS CARGO COVERED BY THIS MANIFEST." (Aircraft crewmember signature)

A21.4. Post Briefing Responsibilities. After receiving the briefing, the aircraft commander (or designated representative) will:

A21.4.1. Sign the cargo manifest.

A21.4.2. Return the signed copy, with the attached Shipper's Declaration for Dangerous Goods to the terminal record-keeping activity for retention.

A21.4.3. When crew changes occur, terminal personnel will brief the oncoming aircraft commander or designated representatives required by **A21.2.** The briefing must cover all hazardous materials (onload and throughload).

A21.4.4. For throughload hazardous cargo, the oncoming aircraft commander (or designated representative) signs a copy of the throughload manifest indicating that the briefing has been received.

A21.4.5. Keep the manifest, reflecting the certification for a hazardous cargo briefing, according to current files, maintenance, and disposition instructions.

Attachment 22

PASSENGER MOVEMENT ON AIRCRAFT TRANSPORTING HAZARDOUS MATERIALS

A22.1. Passenger Eligibility. **Table A4.1.**, column 7 provides passenger eligibility codes that identify passenger movement restrictions with hazardous materials.

A22.1.1. Use **Table A4.1.** and **Table A4.2.** to determine passenger movement eligibility with a specific material.

A22.1.2. Do not move passengers with cargo coded as "Cargo Aircraft Only" unless exempted by this manual. Obtain a passenger deviation when required by this attachment. Passenger deviations may not be issued for contracted commercial aircraft.

A22.1.3. Aircraft transporting personnel located in the same compartment with hazardous materials, which may produce toxic, corrosive, or irritating fumes or has the capability to displace oxygen, must be equipped with serviceable supplemental oxygen equipment and oxygen supply for all personnel in addition to the aircraft's emergency oxygen system. Supplemental oxygen is not required when transporting Air, refrigerated liquid; and Engines, internal combustion.

A22.1.4. Participants in tactical, contingency, emergency, or deployment operations, including exercises transported on military organic aircraft according to DTR, Part III are not considered passengers for the purposes of this manual. Also, applies to military aircraft operating a Special Assignment Airlift Mission (SAAM) providing an exclusive service for movement of unit personnel and their associated cargo.

A22.1.5. Do not transport medical evacuees or release passenger seats to non-participants if any one of the provisions of paragraph **3.6.** are being used. Refer to **Attachment 23** for contract airlift of personnel under DOT-SP 9232.

A22.1.6. Passenger Deviations. Move passengers with hazardous materials coded as "Cargo Aircraft Only" consistent with operational requirements. Prevent exposure of passengers to the hazardous material. A deviation authorizing the movement of passengers with cargo aircraft only material is granted only for exceptional cases.

A22.1.6.1. MAJCOM, Numbered Air Force, or Service having operational control of the aircraft will establish procedures for approving passenger deviations.

A22.1.6.2. When a deviation has been approved, type, print, or stamp on all copies of the passenger manifest the following information: "AUTHORITY TO MOVE PASSENGERS WITH CARGO AIRCRAFT ONLY CODED MATERIAL IS APPROVED. DEVIATION NUMBER:_____."

A22.1.6.3. Separate passengers from the hazardous cargo.

A22.1.6.4. An aircrew member must provide surveillance to ensure passengers are safe and maintain a maximum distance from the hazardous cargo.

A22.1.6.5. Deviations are not required for:

A22.1.6.5.1. Participants (see **Attachment 1**)

A22.1.6.5.2. Guards.

A22.1.6.5.3. Couriers.

A22.1.6.5.4. Technical escorts responsible for cargo.

A22.1.6.5.5. Crew chiefs and maintenance personnel assigned to support the aircraft transporting the hazardous material.

A22.1.6.5.6. DOD duty/space required passengers transported with material coded P4 in column 7 of **Table A4.1.**

A22.1.7. Radioactive Material Passenger Loading Restrictions.

A22.1.7.1. Packages with a radioactive Category II-Yellow or Category III-Yellow label may not be transported on aircraft carrying passengers unless:

A22.1.7.1.1. The transport index is not over 1.0 for a package required to be labeled radioactive Category II-Yellow.

A22.1.7.1.2. The transport index is not over 3.0 for a package required to be labeled radioactive Category III-Yellow.

A22.1.7.2. Radioactive material requiring a label must be separated from personnel and passengers by the greatest distance possible. Radioactive Category II-Yellow and Category III-Yellow material must be separated from passengers by a minimum of 2 pallet positions (176 in) at all times while on the aircraft. If the total transport index of all packages on the aircraft exceeds 50, the separation distance between the surfaces of the radioactive materials packages and the surfaces bounding the space occupied by persons or animals must be at least 9 meters (30 feet).

A22.1.7.3. Do not carry passengers on aircraft transporting:

A22.1.7.3.1. Type B(M) packages.

A22.1.7.3.2. Category II-Yellow or Category III-Yellow radioactive material other than a radioactive material intended for use in, or incident to, research, medical diagnosis, or treatment.

A22.2. Carriage of Hazardous Materials by Passengers. Passengers must not carry hazardous materials on military aircraft. The exceptions listed below are not subject to any other requirements of this manual (nonregulated) when carried by a crewmember or passenger.

A22.2.1. Material in aerosol containers not exceeding 473.1 ml (16 fluid ounces) or 2.205 kg (1 pound) per container when carried in crewmember or passenger baggage (including carry-on baggage), unless they are classified as poisonous or irritating material. The total quantity of the excepted articles carried by any crewmember or passenger in carry-on or checked baggage must not exceed 2136 g or 2217.8 ml (75 net weight ounces and fluid ounces).

A22.2.2. Oxygen, or any hazardous material used for the generation of oxygen, carried for medical use by a passenger on a military aircraft must be an approved cylinder as listed in **Attachment 6**. Comply with 14 CFR 121.574 or 135.91 for DOD contracted civilian passenger aircraft.

A22.2.3. For human beings or animals with an implanted medical device, such as a heart pacemaker, that contains radioactive material or with radio-pharmaceuticals, that have been injected or ingested.

A22.2.4. Carbon dioxide gas cylinders worn by passengers for the operation of mechanical limbs. Spare cylinders of a similar size for the same purpose, in sufficient quantities to ensure an adequate supply for the duration of the journey are authorized in carry-on and checked baggage.

A22.2.5. Electronic devices acceptable for consumer use that contain lithium batteries. Includes, but not limited to laptop computers, cameras, cell phones, watches, etc. Spare batteries for electronic device must be individually protected to prevent short circuit and limited to a one-for-one replacement for the number of batteries needed to operate the device. Installed lithium batteries and spares will not be placed in checked baggage.

A22.2.6. Catalytic hair curlers containing hydrocarbon gas carried in carry-on or checked baggage. The safety cover must be securely fitted over the heating element. Gas refills are not permitted. Not more than one curler per person is authorized.

A22.2.7. Alcoholic beverages not exceeding 70 percent by volume, when packed in receptacles of less than 5 L may be in carry-on or checked baggage.

A22.2.8. Dry ice, in quantities not exceeding 2 kg (4.4 lbs.) per passenger when used to pack perishables in carry-on or checked baggage, provided the package permits the release of carbon dioxide gas.

A22.2.9. Safety matches or a lighter carried by an individual for use by the individual. However, lighters containing unabsorbed liquid fuel (other than liquefied gas), lighter fuel and lighter refills are not permitted on one's person or in checked or carry-on baggage.

A22.2.10. Packaged small arms cartridges (in Class 1.4S), in quantities authorized in DOD 4500.9R, Defense Transportation Regulation, Part I may be in checked baggage. Do not combine allowances for more than one passenger into one or more packages.

A22.2.11. Wheelchairs or other battery-powered mobility devices with spillable or nonspillable batteries, provided that the battery is disconnected, battery terminals are insulated to prevent accidental short circuits and the battery is securely attached to the wheelchair or mobility device may be carried in checked baggage. Load and store batteries attached to these devices with there filling holes upright.

A22.2.12. A mercurial barometer carried by a representative of a government weather bureau or other similar official agency may be in carry-on baggage. However, package the barometer in a strong outer packaging, having a sealed inner liner or a bag of strong leak proof and puncture-resistant material impervious to mercury, which will prevent the escape of mercury from the package irrespective of its position.

A22.2.13. One small carbon dioxide cylinder fitted into a self-inflating life jacket plus one spare cartridge may be carried in carry-on and checked baggage. However, the life jackets cannot contain any explosives, pyrotechnic, or flammable devices.

A22.2.14. Heat producing articles such as underwater torches (diving lamps) and soldering irons may be in carry-on baggage.

A22.2.15. Scuba diving tanks containing not more than 25 pounds per square inch at 21 degrees C (70 degrees F) may be shipped as checked baggage. A tag or label must be affixed to the tank by a dive shop or licensed individual to indicate service was performed.

Attachment 23

USE OF CONTRACT AIR CARRIERS

A23.1. Contract Air Carriers. Airlift of military hazardous materials utilizing contract air carriers approved by HQ Air Mobility Command (HQ AMC) to transport hazardous materials is authorized according to Department of Transportation Special Permits (DOT-SP) 7573 and 9232, DOD 4500.9R, DTR, Part III, 49 CFR, 173.7(a), and this manual.

A23.2. DOT-SP 7573. The DOD is authorized to transport hazardous materials via AMC commercial contract cargo aircraft under the authority of DOT-SP 7573 according to the following conditions:

A23.2.1. The pilot in charge is notified in writing that the permit is being used and a copy of DOT-SP 7573 must accompany the shipment. See **Attachment 21** for the statement required on the hazardous cargo manifest and briefing requirements.

A23.2.2. Stamp or mark shipping papers (cargo manifest), "DOT-SP 7573 Applies."

A23.2.3. Hazardous material shipments are in complete compliance with this manual.

A23.2.4. Segregation compatibility requirements of **Table A18.1.** and **Table A18.2.** apply.

A23.2.5. Comply with **A13.4.** or **A13.5.** for vehicle and support equipment fuel levels.

A23.2.6. Ensure compliance with all other requirements of the permit.

A23.3. DOT-SP 9232. Comply with DOT-SP 9232 and this manual. USTRANSCOM is approval authority for this permit. USTRANSCOM may implement all or only portions of DOT-SP 9232 or apply additional restrictions when permit is used during a declared national emergency; in defense crisis conditions which require the activation of any state of the Civil Reserve Air Fleet (CRAF) program, or the use of foreign-flag aircraft made available to the United States Government (USG) pursuant to formal security agreements between the USG and the involved foreign government; or during rapid deployment of US armed forces.

A23.3.1. Cargo Aircraft. The following special provisions apply:

A23.3.1.1. Comply with provisions of DOT-SP 7573 and **A23.2.** (with the exception of stamping or marking shipping papers "DOT-SP 7573 Applies").

A23.3.1.2. Stamp or mark shipping papers (cargo manifest), DOT-SP 9232 Applies."

A23.3.1.3. Based on operational requirements, segregation requirements of **A18.4.** may be used.

A23.3.1.4. Do not remove hazardous materials from required packaging and place in equipment, vehicle racks, or containers.

A23.3.2. Passenger Aircraft. The following special provisions apply:

A23.3.2.1. Package and certify hazardous materials shipped as cargo according to this manual.

A23.3.2.2. Stamp or mark shipping papers (cargo manifest), "DOT-SP 9232 Applies."

A23.3.2.3. Individual issue hazardous materials may only be removed from outer packaging when needed to meet operational requirements. The troop commander must identify to the aircraft commander (or designated representative) in writing, any hazardous materials removed from

outer packaging, that are in rucksacks or field packs, which are not already included on the cargo manifest according. Identify hazardous materials by PSN, hazard class, UN identification number, PG, and net quantity. Hazardous materials must be packaged to prevent accidental initiation or release.

A23.3.2.4. Load hazardous materials only in the cargo compartment. Hazardous materials (including small arms ammunition) are not authorized in the passenger compartment.

A23.3.2.5. Do not remove hazardous materials from required packaging and place in equipment, vehicle racks, and containers.

A23.4. Use of Passenger Carrying Aircraft. When requirements dictate movement of hazardous materials as cargo on commercial passenger aircraft, contracted to Air Mobility Command, for other than a national emergency, ensure the material is prepared according to 49 CFR 100-199. Type and quantity of material authorized will be according to 49 CFR 172.101 for passenger carrying aircraft. This manual may be used for hazardous materials certification. Do not transport hazardous materials in passenger compartment.

Attachment 24

SPECIAL CARGO REQUIREMENTS

A24.1. Material Requiring SAAM Airlift. This attachment identifies requirements for technical escorts and other extensive protective measures for extremely hazardous materials. The provisions of this attachment apply to the following shipments:

A24.1.1. Material identified in **Table A4.1.** as Special Provision 1 (P1) which include, but are not limited to, Class 6.1, PG 1, hazard zone A and Class 2.3 hazard zone A toxic material, and Infectious Substances, Affecting Humans.

A24.1.2. Class 1, compatibility group K.

A24.1.3. Fissile Class III Radioactive Material.

A24.1.4. Class 7, Category III-Yellow material with a Transport Index greater than 10.

A24.1.5. Any other material determined to need technical escorts for safety concerns.

A24.2. Transportation Requirements.

A24.2.1. Transport the materials identified in **A24.1.** by Special Assignment Airlift Mission (SAAM) only. Process SAAM requests, cargo clearance, and appropriate confirmations according to DOD 4500.9R, Defense Transportation Regulation.

A24.2.2. When Class 6.1, PG I, hazard zone A and Class 2.3, hazard zone A toxic materials, or Infectious Substances, Affecting Humans (UN2814) are shipped by air, the consignor is required to furnish or ensure availability of:

A24.2.2.1. Complete protective clothing and equipment for all aircrew members.

A24.2.2.2. Qualified technical escort personnel, applicable decontamination and detection equipment or supplies, and suitable first-aid equipment or supplies to cope with leaking containers during airlift.

A24.2.3. Fissile class III shipments and Class 7, Category III-Yellow material with a Transport Index greater than 10, must incorporate transportation controls that are performed by the shipper or carrier, as appropriate, to provide nuclear criticality safety.

A24.2.3.1. Transport Fissile class III and Class 7, Category III-Yellow material with a Transport Index greater than 10, on aircraft assigned to the exclusive use of the shipper with a specific restriction for the exclusive use to be provided in the appropriate arrangements between shipper and carrier and with instructions to that effect issued with the shipping papers.

A24.2.3.2. Protect Fissile class III against loading, storing, or transporting that shipment with any other fissile material and any other packages of radioactive material requiring one of the labels prescribed in **Attachment 15**.

A24.2.4. Exceptions. Service focal points may waive SAAM requirements for the following:

A24.2.4.1. Liquids with a mist Inhalation Zone A, PG I hazard, less than 5 L per package, and solids with a toxic Inhalation hazard Zone A, PG I hazard, less than 15 kg per package. Passenger prohibition code "P2" applies.

A24.2.4.2. Infectious Substance, Affecting Humans (UN 2414) less than 4 L or 4 Kg per package. Passenger prohibition code "P2" applies.

A24.3. Technical Escorts. Furnish technical escorts when service regulations (or cargo clearance arrangements) require it, or when the shipping activity's medical or flight safety personnel dictate. The shipping activity must initiate action to furnish the qualified personnel, when they are required. They must also furnish technical escorts or other personnel to accompany shipments of infectious substances (etiologic agents) or plant quarantine materials per **A10.8.** When the shipping activity is required to furnish qualified personnel, it will also initiate action to furnish all required protective clothing and equipment for crew members, in addition to the appropriate decontamination detection and emergency first-aid equipment. The escort has complete jurisdiction over the cargo as it pertains to normal security, safety, protection of personnel, repair, and disposal of containers. However, in the following situations, escort authorities are primarily technical advisors, and are subordinate to:

A24.3.1. The aircraft commander in matters of flight operations and safety.

A24.3.2. The base installation commander in matters affecting the safety and mission of the command.

A24.4. Shipping Documents for Infectious Substances (Etiologic Agents). An etiologic agent and plant quarantine material shipment record must accompany all shipments of infectious substances (etiologic agents) transported under the provisions of this attachment. The consignor (shipper) must prepare this record.

A24.4.1. If the shipping document is classified, it must be in the custody of the technical escort or other qualified personnel accompanying the shipment. In the absence of accompanying personnel, and if the document is not classified, the shipper will place the original and one copy in the outermost container of the number one package.

A24.4.2. On receipt at the receiving installation, a record of the shipment's condition should be made under "Remarks." Two copies of the completed form should be forwarded directly to the Commanding Officer, US Army, Fort Detrick, Frederick MD 21701-5000, Attn: (1) Transportation Officer, and (2) Liaison Officer (USPHS). This creates a permanent record file that is in compliance with agreements between DOD and the Department of Health and Human Services; and also between DOD and the Department of Agriculture.

A24.4.3. The agency receiving the shipment is responsible for forwarding the report indicated above within 2 hours of receipt.

A24.5. Aircrew Jettison Criteria. For cargo consisting of Class 6.1, PG I, hazard zone A toxic material; Class 2.3, hazard zone A toxic material; infectious substances; biological agents; or radioactive material (other than excepted quantities), the jettison criteria are as follows:

A24.5.1. Must not be jettisoned over land.

A24.5.2. May not be jettisoned over water unless the cargo, in addition to size criteria, weighs at least 1.6 g/cm^3 (100 lbs./ft^3) to ensure sinking. Also, the cargo must be jettisoned at least 19.3 kilometers (12 miles) offshore, and preferably beyond a shelf, in water 100 fathoms (600 ft) or more in depth. The aircraft commander is given a predeparture briefing on acceptable jettisoning locations based on

the above criteria. When cargo is jettisoned to decrease weight, jettison all other cargo before hazardous cargo.

A24.5.3. When cargo is leaking and is beyond control of the escort to repair or neutralize, the escort must inform the aircraft commander. The decision of jettisoning will rest with the aircraft commander. In this instance, the commander may jettison the cargo over water without regard to weight or depth criteria.

A24.5.4. When the cargo weighs less than 1.6 g/cm^3 (100 $lb./ft^3$) or when size of cargo would not permit inflight jettisoning, model of aircraft selected for overwater missions must be based on two-engine performance from equal time point (ETP) to destination. Aircraft performance is based on aircraft remaining airborne when all cargo except the hazardous cargo is jettisoned.

Attachment 25

HAZARDOUS MATERIALS INITIAL AND REFRESHER TRAINING

A25.1. Training General Requirements. This attachment identifies the hazardous material training required by paragraph **1.3.** Commanders assign hazardous material workers into one of four functional groups. Training requirements are based on functional group. This approach provides basic hazardous materials training applicable to all personnel at the first level. Trainers then provide more detailed training to supplement the basic level of training based on specific job responsibilities.

A25.2. Training for Noncertifying Officials. Train individuals according to the following general areas of responsibility. Unless otherwise required by Service/Agency directives, training may be performed locally. Trainers should develop training specific to the individual's hazardous material duties. The courses listed are suggested DOD courses that may be used to satisfy the applicable level of training. Telephone contact numbers are listed the first time the training location is identified. Commercial or other government sources may also be used for training other than Preparer level to the extent it satisfies the required level of training.

A25.2.1. Handlers. Trainers ensure training covers basic hazardous material familiarization, awareness, and communication requirements. This includes hazard classification, marking, labeling, placarding, documentation, compatibility, and safety (including emergency response information). Training will also include handling and job (function) specific requirements.

A25.2.1.1. HAZMAT Familiarization and Safety in Transportation, AMMO-67, Web Based Training, U.S. Army Defense Ammunition Center, McAlester OK 74501. Telephone DSN 956-8961 or commercial (918) 420-8961.

A25.2.1.2. Hazardous Materials Handling, SMPT-5, Correspondence, School of Military Packaging Technology, Aberdeen Proving Ground MD 21005-5001. Telephone DSN 298-5185 or commercial (410) 278-5185, **http://smpt.apg.army.mil/CORR/Corr.htm**.

A25.2.1.3. Transportation of Hazardous Material for Supervisors, A822-0014, Navy Supply Corps School, Athens GA 30606. Telephone DSN 588-7207/7215 or commercial (706) 354-7207/7215.

A25.2.1.4. Storage and Handling of Hazardous Materials (R511), DLA Training Center (DTC), Columbus, OH 43213-1430. Telephone DSN 850-5969 or commercial (614) 692-5969/ (800) 458-7903/ E-mail: **mailto:INFO@dtc.dla.mil**.

A25.2.1.5. Triennial Storage and Handling of Hazardous Material Recurrent (R611), DLA Center for Training, Education, and Development (DCTED), 380 Morrison Road, Columbus, OH 43213-1430. Telephone DSN 850-5986 or commercial (614) 692-5986/(800) 458-7903 / E-mail: **mailto:INFO@dpcso.dla.mil**.

A25.2.1.6. Handling Hazmat / Explosives, Air Freight Course CBT, **https://afi-adl.mont.disa.mil**, Air Mobility Warfare Center, Air Transportation Division, USAF MOS/ MOOT. Telephone DSN 650-7498/7502.

A25.2.1.7. Department of Defense Hazardous Materials Packaging, Computer Based Training (CBT), Defense Distribution Center, DDC-J-3/J-4-TPR, 8000 Mission Drive, New Cumberland,

PA. 17070. Telephone DSN 430-2923 or commercial (717) 605-2923, **http://www.dtc.dla.mil/HAZMAT/index.html**.

A25.2.2. Packers. Packers, who do not certify, must work closely with the preparer (certifier) and must not close (seal) the container until the preparer (certifier) has validated the packaging. Trainers ensure that packers are knowledgeable in all aspects of handler's requirements with additional emphasis in hazardous materials packaging requirements.

A25.2.2.1. DOD POP Program (R530 and R630-Refresher), Defense Distribution Center, DDC-J-3/J-4-0, 2001 Mission Drive, New Cumberland, PA 17070-5000. Telephone DSN 771-8238/8353 or commercial (717) 770-8238/8353. Web Available at: **http://www.ddc.dla.mil/pop/**

A25.2.3. Inspectors. In addition to handlers' requirements, trainers ensure that inspectors are knowledgeable in the use of commercial and military hazardous materials documents, and shipping papers. Inspectors should be familiar with appropriate packaging specifications.

A25.2.3.1. Hazardous Materials Airlift Inspector Course (L3AZR2T251 00AA - Initial (Resident) or L7AZT2T251 00AA – Initial (Mobile)), 345 TRS/TTTD, Lackland AFB TX 78236-5427. Telephone DSN 473-4917 or commercial (210) 671-4917.

A25.2.3.2. Transportation of Hazardous Material for Supervisors, A822-0014, Navy Supply Corps School, Athens GA 30606.

A25.3. Training for Certifying Officials. Preparers (certifying officials), as defined in paragraph **1.2.4.**, are authorized to accomplish the Shipper's Declaration for Dangerous Goods certification according to paragraph **1.2.7.** Supervisors must consult DOD Catalog 5010.16-c *Defense Management Education and Training* to select the most appropriate course for the individual based on course prerequisites. Train preparers based on one of the following function specific requirements:

A25.3.1. Preparers. Personnel whose primary duty is preparing and certifying all types of hazardous materials shipments on a daily basis. The courses identified below are authorized only if developed and administered according to the most recent Interservice Training Review Organization Task Group on Hazardous Materials Training Memorandum of Understanding (MOU). The MOU is developed jointly with each school and Service/DLA policy focal point to ensure standard and adequate Preparer level training for DOD personnel. Any deviation from the MOU invalidates the course and is not authorized as acceptable training under this manual. These individuals must have satisfactorily completed one of the qualifying courses:

A25.3.1.1. Initial Training Courses. Personnel identified in **A25.3.1.** must satisfactorily complete one of the initial training courses identified below as a prerequisite to certifying the Shipper's Declaration for Dangerous Goods for airlift of hazardous cargo.

A25.3.1.1.1. Hazardous Material Preparer Course (L3AZR2T051 00AA, Initial (Resident) or L7AZT2T051 00AA, Initial (Mobile)), 345 TRS/TTTD, Lackland AFB TX 78236-5427. Telephone DSN 473-4917 or commercial (210) 671-4917.

A25.3.1.1.2. Technical Transportation of Hazardous Materials (AMMO-62, Resident or AMMO-62OS On Site), U.S. Army Defense Ammunition Center and School, McAlester OK 76544.

A25.3.1.1.3. Defense Packaging of Hazardous Materials for Transportation, 8B-F7(JT), Resident and On Site, School of Military Packaging Technology (SMPT), Aberdeen Proving Ground MD 21005-5282. Telephone DSN 298-5185 or commercial (410) 278-5185.

A25.3.1.1.4. Transportation of Hazardous Material-Basic (A-822-0012), Navy Supply Corps School, Athens, GA 30606-5520. Telephone DSN 588-7215 or commercial (706) 354-7215/ 7240.

A25.3.1.2. Refresher Training Courses. Personnel, who have previously completed one of the courses specified in **A25.3.1.1.**, must satisfy the 24-month refresher training requirement of **A25.4.** by completing one of the following courses:

A25.3.1.2.1. Hazardous Material Preparer Refresher (Exportable) (L6ARW2T051 00AA), 345 TRS/TTTD, Lackland AFB TX 78236-5427. Telephone DSN 473-3369 or commercial (210) 671-3369. This course approved for Air Force, Army, DLA, DCMA, and Marine Corps activities only.

A25.3.1.2.2. General Transportation of Hazardous Materials (AMMO-37, Resident or AMMO-370S, On Site), U.S. Army Defense Ammunition Center, McAlester OK 76544. Telephone DSN 956-8961 or commercial (918) 420-8961.

A25.3.1.2.3. Defense (Refresher) Packaging of Hazardous Materials for Transportation, 8B-F35 (JT) Resident and On Site, School of Military Packaging Technology (SMPT), Aberdeen Proving Grounds MD 21005-5001.

A25.3.1.2.4. Transportation of Hazardous Material-Recertification (A-822-0011), Navy Supply Corps School, Athens GA 30606-5520.

A25.3.1.2.5. Hazardous Materials Inspector Refresher (Exportable) (L6ARW2T251 00AA), 345 TRS/TTTD, Lackland AFB TX, 78236-5427, Telephone DSN 473-4885 or commercial (210) 671-4885.

A25.3.2. Technical Specialist. Technical specialists may only sign the Shipper's Declaration for Dangerous Goods form as a certifying official on items they are technically qualified to maintain and prepare for shipment. A technical specialist will:

A25.3.2.1. Be designated in writing by the Commander to certify the unit or activity's hazardous materials upon completion of training that includes:

A25.3.2.1.1. Packaging and preparation. Training may be obtained by formal training/job skills or from an individual qualified by formal training/job skills to package/prepare hazardous materials specific to the unit or activity.

A25.3.2.1.2. Certification, marking, labeling, and all other aspects of this manual relevant to the hazardous materials specific to the unit or activity. Training must be conducted by an individual qualified as a Preparer according to **A25.3.1.**

A25.3.2.2. This authorization applies to mobility operations conducted according to DOD 4500.9R, Defense Transportation Regulation, Part III. Technical specialists may provide necessary documentation required by **A17.1.1.2.** to transportation offices for non-mobility movement.

A25.3.2.3. Air Force activities use the "Hazardous Material Technical Specialist Instructional Guidance" training material to develop and administer a local technical specialist training pro-

gram. Contact your MAJCOM transportation office for guidance and the AFMC LSO/LOT HAZMAT web site to obtain a copy of the material.

A25.3.2.4. The following training is available for medical personnel (i.e., anyone involved with the transportation of pathogens or etiologic agents, except when mixed with explosives or substances in other hazard classes) who manage, package, certify, or prepare laboratory samples and specimens and regulated medical waste only, for transport by any mode.

A25.3.2.4.1. Transport of Biomedical Material Course (Initial or Refresher), U. S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), Aberdeen Proving Ground, MD 21010-5403. Telephone DSN 584-5228/3651 or commercial (410) 436-5228/3651.

A25.4. Security Awareness Training. Each employee associated with the packaging and transportation of hazardous materials must receive security awareness training in accordance with DOD 4500.9-R, Defense Transportation Regulation, Part II, Chapter 205.

A25.5. Training Frequency. All hazardous material personnel must receive initial training and subsequent refresher training at 24-month intervals. This applies to all levels (i.e., Handlers, Packers, Inspectors, Technical Specialists, and Preparers) of required training. Train individuals based on functional group requirements.

A25.5.1. Each Service focal point or major command (MAJCOM) focal point may grant an extension to this qualification expiration date for a period not to exceed 60 calendar days during which eligible personnel must receive training.

A25.5.2. Each Service focal point or MAJCOM focal point may grant successive 60-day extensions to a person's qualification expiration date for long-term tactical or contingency operations. In this instance, personnel extended past their initial 60-day extension may only certify hazardous materials moved according to the tactical or contingency operation. Once personnel return to normal duty, train each person as specified in this attachment.

A25.5.3. Each Service focal point or MAJCOM focal point is responsible for management of the extension authority and may establish more stringent training frequencies to enhance training requirements.

A25.6. Training Records. Test all hazardous material personnel and maintain a record of the training provided. Maintain and dispose of records according to an approved Records Disposition Schedule. As a minimum, maintain the record for as long as the person works for the DOD as a hazardous material employee and for 90 days after separation from the DOD. This record must indicate the following:

A25.6.1. Name of person who received the training.

A25.6.2. Date training took place.

A25.6.3. A description, copy, or location of training materials used to train the person.

A25.6.4. The name and address of the person who provided the training.

A25.6.5. Certification statement of completion of training and testing.

A25.7. Certification Under Combat Conditions. An aircraft commander (or representative designated by the commander) may accept a hazardous materials shipment under a combat situation without regard to the above training.

A25.8. Non-DOD Personnel Certifying Hazardous Material Shipments. Non-DOD personnel preparing hazardous materials for transportation by military air must do so according to this manual. DOD does not require non-DOD personnel to complete the training courses specified in this attachment. However, these individuals must meet the requirements of Title 49 CFR Part 172 Subpart H *Training* for all employees having responsibility for preparing hazardous materials for shipment. Training must include function specific duties related to military air transportation. Non-DOD personnel who desire the training outlined in this attachment must contact their contract administration office.

Attachment 26

TABLE OF EQUIVALENTS AND NET QUANTITY OF GAS CONVERSION FORMULA

A26.1. Metrics. **Figure A26.1.** provides a list of metric prefixes.

Figure A26.1. Metric Prefixes.

Deci	0.1	Deca	10
Centi	0.01	Hecto	100
Milli	0.001	Kilo	1,000
Micro	0.000001	Mega	1,000,000
Nano	0.000000001	Gica	1,000,000,000
Pico	0.000000000001	Tera	1,000,000,000,000

A26.2. Miscellaneous Conversions. **Figure A26.2.** provides a list of general miscellaneous conversions for use with this manual.

Figure A26.2. Miscellaneous Conversions.

VOLUME:	
1 liter	0.264 gallon,
	1.057 quarts,
	61.025 cubic inches,
	33.815 fluid ounces
1 cubic foot	28.32 liters,
	7.481 gallons,
	1728 cubic inches
1 cubic meter	1000 liters,
	35.31 cubic feet,
	264.2 gallons
1 milliliter	0.0338 oz
1 gallon	3.785l
1 oz	29.57 ml

LENGTH:	
1 centimeter	0.3937 inches
1 meter	3.28 feet, 39.37 inches
1 inch	2.54 cm, 25.4 mm
1 foot	0.3048 m
1 millimeter	0.03937 in

VOLUME	
1 newton	101.97 gram force

WEIGHT:	
1 gram	0.03527 ounces,
	0.0022 pounds avoirdupois
1 kilogram	2.205 pounds,
	35.274 ounces
1 pound	0.4536 kg
1 ounce	28.35 grams

PRESSURE:	
1 pound per square inch	6.895 kilopascal
1 kilopascal	0.145 psi

RADIOACTIVE	ACTIVITY:
1 TBq	27 Ci
1 Sv/hr	100 rem/hr
1 rem/hr	0.01 Sv/hr

A26.3. Temperature Conversion. Use **Figure A26.3.** to convert temperatures between Celsius and Fahrenheit.

Figure A26.3. Temperature Conversion Formula.

C = (F-32) times 5/9
F = (C times 9/5) + 32
K = C + 273.15
C = degrees Celsius
F = degrees Fahrenheit,
K = degrees Kelvin (absolute)

A26.4. Tank Volume. Use **Figure A26.4.** to determine tank volume.

Figure A26.4. Tank Volume Formula.

Formula	$V = p\ r^2\ h$
where:	V= Tank Volume
	p= 3.142
	r^2= radius of tank
	h= height of tank

A26.5. Net Quantity of Gas Conversion Formula. Use **Figure A26.5.** to determine the net hazard of a compressed gas by converting PSI of a cylinder into pounds. Use **Figure A26.6.** to determine the molecular weight or specific gravity required to complete the formula.

Figure A26.5. Net Quantity of Gas Conversion Formula.

Formula (1)	P= 0.00512 x A x B x C
	or
Formula (2)	P= .0001744 x A x B x M
where:	P= weight of gas in pounds
	A= pressure in pounds per square inch
	B= volume of cylinder in cubic feet
	C= specific gravity of the gas
	M= molecular weight of the gas molecule

NOTE: Use Formula (1) for calculation using the specific gravity value.
Use Formula (2) for calculation using the molecular weight value.

A26.5.1. Example for Determining Net Quantity of Gas. The following information is known or determined by examination of the cylinder. Measure the cylinder's height from the external base to the valve seat. Measure the external diameter (width). Assume the cylinder does not cone at the top.

A26.5.1.1. **Example 1.**

Tank measurements:

Height: 50 inches

Diameter: 9 inches

Radius: 4.5 inches

Tank contents: CO_2

Internal Pressure: 900 psi

Tank Volume = 1.841 Ft^3

P (pounds of gas) = 0.00512 x A x B x C = {0.00512 in^2/Ft^3} x {900 psi} x {1.841 Ft^3} x {1.516}

Answer: *P = 12.9 pounds*

A26.5.1.2. **Example 2.**

Tank measurements:

Height: 40 inches

Diameter: 12 inches

Radius = 6 inches

Tank contents: C_2H_2

Internal Pressure: 500 psi

Tank Volume = 2.618 Ft^3

P (pounds of gas) = 0.00512 x A x B x C = {0.00512 in^2/Ft^3} x {500 psi} x {2.618 Ft^3} x {0.897}

Answer: *P = 6.01 pounds*

A26.5.1.3. **Example 3.**

Tank measurements:

Height: 50 inches

Diameter: 9 inches

Radius = 4.5 inches

Tank contents: CO_2

Internal Pressure: 900 psi

Tank Volume = 1.841 Ft^3

P = 0.0001744 x A x B x M = 0.0001744 x (900 psi) x (1.841 Ft^3) x (44.00)

Answer: *P = 12.7 pounds*

A26.5.1.4. **Example 4.**

Tank measurements:

Height: 40 inches

Diameter: 12 inches

Radius = 6 inches

Tank contents: C_2H_2

Internal Pressure: 500 psi

Tank Volume = 2.618 Ft^3

P = 0.0001744 x A x B x C = 0.0001744 x (500 psi) x (2.618 Ft^3) x (26.00)

Answer: *P = 5.94 pounds*

A26.5.2. Examples for Determining Radioactive Shipments. A_1/A_2 values represent the maximum activity that can be shipped in a Type A package. A_1 is for Special form material and A_2 values is for Normal or Other form material. In dealing with mixtures of radionuclides if the sum of the ratios is $\leq$1, then use a Type A package. If the sum of the ratios is >1, then use a Type B package.

A26.5.2.1. **Example 1.** Determine the most appropriate packaging when shipping a mixture of 0.46 TBq of Bromine-77 (Br-77) & 0.25 TBq of Cerium-143 (Ce-143).

Activity you have / Activity allowed = sum of the ratio

0.46 TBq/3 TBq = 0.15 (A_2 for Br-77)

0.25 TBq/0.6 TBq = 0.42 (A_2 for Ce-143)

0.15 + 0.42 = 0.57 Total sum of the ratios 0.57 $\leq$ 1, so a Type A package is required

A26.5.2.2. **Example 2.** Determine if the item can be shipped as a RQ of a hazardous substance.

Shipping a mixture of 2.02 TBq of Silver-112 (Ag-112), 0.16 TBq of Tin-113 (Sn-113) & 0.21

TBq of Tungsten-185 (W-185).

Activity you have / Reportable Quantity = RQ

2.02 TBq/3.7 TBq = 0.546 (RQ for Ag-112)

0.16 TBq/0.37 TBq = 0.432 (RQ for Sn-113)

0.21 TBq/0.37 TBq = 0.568 (RQ for W-185)

Total RQ of 1.576 > 1Therefore, mixture would be regulated as a hazardous substance.

A26.5.2.3. **Example 3.** Determine the most appropriate packaging when shipping the following:

1.45 TBq of Terbium-160 (Tb-160)

A_2 value for Tb-160 is 0.6 TBq.

1.45 TBq > 0.6 TBq Since the amount you are shipping is greater than the A_2 value; a

Type B package is required.

A26.5.2.4. **Example 4.** Determine the most appropriate packaging when shipping the following:

0.45 GBq of solid Niobium (Nb-95) internationally

0.45 GBq converted is 0.00045 TBq

A_2 value for Nb-95 = 1 TBq

$10^{-3}A_2$ = 0.001 TBq > 0.00045 TBq

A26.5.2.4.1. Since the maximum activity allowed is greater than amount being shipped, the item can be shipped in an Excepted package.

A26.6. Properties of Common Gases. **Figure A26.6.** is a list of the molecular weight and specific gravity of common gases.

Figure A26.6. Properties of Common Gases.

GAS	SYMBOL	MOLECULAR WEIGHT	SPECIFIC GRAVITY
Helium	He	4.00	0.138
Argon	A	40.00	1.377
Air	-	29.00	1.000
Oxygen	O_2	32.00	1.103
Nitrogen	N_2	28.00	0.966
Hydrogen	H_2	2.00	0.0695
Nitric Oxide	NO	30.00	1.034
Carbon Monoxide	CO	28.00	0.965
Hydrochloric Acid	HCl	36.50	1.256
Steam	H_2O	18.00	0.623
Carbon Dioxide	CO_2	44.00	1.516
Nitrous Oxide	N_2O	44.00	1.518
Sulfur Dioxide	SO_2	64.00	2.208
Ammonia	NH_3	17.00	0.587
Acetylene	C_2H_2	26.00	0.897
Methyl Chloride	CH_2Cl	50.50	1.738
Methane	Ch_4	16.00	0.553
Ethylene	$C2H_4$	28.00	0.967

Attachment 27

PREPARING EXPLOSIVES PACKAGED PRIOR TO 1 JANUARY 1990

A27.1. General Requirements. Use this attachment to verify existing packaging which is exempt from UN specification packaging requirements according to paragraph **1.7.2.** The methods of packaging described in this attachment were authorized by 49CFR and in effect on 31 December 1989.

A27.1.1. See **Attachment 17** for certification requirements.

A27.1.2. Use Proper Shipping Names identified in **Table A4.1.** in place of DOT names described in this attachment.

A27.1.3. See **Attachment 5** for special and general handling instructions.

A27.1.4. Comply with **Attachment 24** for ammunition or explosives which are packed in freon for safety during movement or which contain toxic substances previously described as a "Class A Poison."

A27.1.5. Unstable, condemned, or deteriorated explosives will not be shipped by military air. Unserviceable explosives may be shipped if otherwise safe for transportation.

A27.1.6. See **Attachment 14** and **Attachment 15** for marking and labeling requirements.

A27.1.7. Shipping Papers (e.g., manifest) and Shipper's Declaration For Dangerous Goods (Key 19) must be annotated, "Government owned goods packaged prior to 1 January 1990."

A27.1.8. Damaged or unserviceable packaging will not be shipped by military air. Repackage explosives according to current guidance in **Attachment 5**.

A27.1.9. See **Table A27.1.** for an explosive or ammunition cross reference. In this table, column 1 contains a list of explosive/ammunition with column 2 giving the paragraph from AFR 71-4 and column 3 identifying the paragraph for that item in this manual.

A27.1.10. Use DOT/Military specification containers specified in this attachment, when applicable. Use UN Specification packaging specified in **Attachment 5** when repackaging is required. See **Table A27.2.** for DOT/Military specification container cross reference.

Table A27.1. Explosive/Ammunition Cross Reference.

Name of Explosive or Ammunition	AFR 71-4 Paragraph	AFMAN 24-204(I) Paragraph
Actuating Cartridges, Explosive, Fire Extinguisher or Actuating Cartridge, Explosive, Valve	5-32	**A27.16.**
Ammunition for Cannon (with Empty Projectiles; with Inert Loaded Projectiles; with Solid Projectile; without Projectiles; with Tear Gas Projectiles, Class B Explosives; with Explosives Projectiles; with Gas Projectiles; with Illumination Projectiles; with Incendiary Projectiles; with Smoke Projectiles and with Tear Gas Projectiles, Class A Explosives	5-10	**A27.2.**
Ammunition for Small Arms with Incendiary Projectiles and Ammunition for Small Arms with Explosives Projectiles	5-11	**A27.3.**
Black Powder and Low Explosives	5-13	**A27.4.**
Blasting Agent NOS	5-63	**A27.31.**
Cartridge, Practice Ammunition	5-62	**A27.30.**
Common Fireworks, Signal Flares, Hand Signal Devices, Smoke Signals, Smoke Candles, Smoke Grenades, Smoke Pots, and Very Signal Cartridges	5-23	**A27.9.**
Cord, Detonating; Fuse, Mild Detonating, Metal Clad; and Flexible Linear Shaped Charges, Metal Clad	5-25	**A27.10.**
Detonating, Fuzes, Class C Explosives	5-27	**A27.11.**
Detonating Fuzes, Class A Explosives; Booster, Explosive; Burster, Explosive and Supplementary Charges, Explosive	5-17	**A27.6.**
Detonating Primers, Class A Explosives and Detonating Primers, Class C Explosives	5-28	**A27.12.**
Detonators, Class A Explosives and Detonators, Class C Explosives	5-14	**A27.5.**
Explosive Bomb; Explosive Mine; Explosive Projectile; Explosive Torpedo; Grenade, Hand, Explosive; and Grenade, Rifle, Explosive	5-29	**A27.13.**
Explosive Cable Cutters; Explosive Power Device, Class C; Explosive Release Device, or Starter Cartridges, Jet Engine, Class C Explosive	5-30	**A27.14.**
Explosive Power Device, Class B	5-56	**A27.28.**
Explosive Rivets	5-31	**A27.15.**
Fuze, Combination; Fuze, Percussion; Fuze, Time; Fuze, Tracer; or Tracer	5-22	**A27.8.**
Grenade, Tear Gas Irritating Material	10-37	**A5.15.**

Name of Explosive or Ammunition	AFR 71-4 Paragraph	AFMAN 24-204(I) Paragraph
High Explosives	5-34	**A27.18.**
High Explosives, Liquids	5-35	**A27.18.1.**
High Explosives With Liquid Explosive Ingredients	5-36	**A27.18.2.**
High Explosives With No Liquid Explosive Ingredient and Propellant Explosives, Class A	5-37	**A27.18.3.**
High Explosives With No Liquid Explosive Ingredient Nor Any Chlorate	5-38	**A27.18.4.** – **A27.18.12.**
Igniter Cord	5-39	**A27.19.**
Initiating Explosive (Diazodinitrophenol or Lead Monoitroresorcinate)	5-40	**A27.20.1.**
Initiating Explosive (Guanyl Nitrosomino Guanylidene Hydrazine)	5-41	**A27.20.2.**
Initiating Explosive (Lead Azide Dextrinated Type Only)	5-42	**A27.20.3.**
Initiating Explosive (Lead Styphnate (Lead Trinitrosorcinate) or Barium Styphnate, Monohydrate)	5-43	**A27.20.4.**
Initiating Explosive (Nitro Mannite)	5-44	**A27.20.5.**
Initiating Explosive (Nitrosoguanadine)	5-45	**A27.20.6.**
Initiating Explosive (Pentaerythrite Tetranitrate)	5-46	**A27.20.7.**
Initiating Explosive (Tetrazene)	5-47	**A27.20.8.**
Initiating Explosive (Fulminate of Mercury)	5-48	**A27.20.9.**
Oil Well Cartridges	5-64	**A27.32.**
Propellant Explosives, Solid or Liquid (Class A or B Explosives)	5-51	**A27.24.**
Railway Torpedoes	5-33.a.(6)	**A27.23.**
Rocket Ammunition with (Inert Loaded Projectiles, Solid Projectiles, Empty Projectiles, Explosive Projectiles, Gas Projectiles, Smoke Projectiles, Incendiary Projectiles, or Illuminating Projectiles)	5-52	**A27.25.**
Rocket Engine (Liquid), Class B Explosives	5-61	**A27.29.**
Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors, Igniters, Rocket Motors; Igniters, Jet Thrust; Igniters, Ramjet Engine (Class B explosives) or Starter Cartridge, Jet Engine	5-50	**A27.22.**
Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors; or Igniters, Jet Thrust (Class A Explosives)	5-49	**A27.21.**

Name of Explosive or Ammunition	AFR 71-4 Paragraph	AFMAN 24-204(I) Paragraph
Small Arms Ammunition and Small arms Ammunition, Tear Gas Cartridges	5-53	**A27.26.**
Small Arms Primer; Cannon Primer; Combination Primer; Percussion Cap; Grenades Empty, Primed	5-18	**A27.7.**
Special Fireworks	5-33	**A27.17.**
Toy Caps	5-54	**A27.27.**
Delay Electric Igniter; Electric Squib; Empty Cartridge Bag with Black Powder Igniter; Fuse Igniter; Fuse Lighter; Igniter Fuse, Metal Clad; Igniter; Safety Squib	5-19	**A27.33.**

A27.2. Ammunition for Cannon (with Empty Projectiles; with Inert Loaded Projectiles; with Solid Projectile; without Projectiles; with Tear Gas Projectiles, Class B Explosives; with Explosives Projectiles; with Gas Projectiles; with Illumination Projectiles; with Incendiary Projectiles; with Smoke Projectiles and with Tear Gas Projectiles, Class A Explosives. Package in strong wooden or metal containers, or plastic containers approved by military specifications or drawings.

A27.3. Ammunition for Small Arms with Incendiary Projectiles and Ammunition for Small Arms with Explosives Projectiles. Package in strong wooden or metal containers approved by military specifications or drawings not to exceed 175 pounds gross weight.

A27.4. Black Powder and Low Explosives.

A27.4.1. Metal kegs, DOT 1, not less than 7 inches long. Net weight not less than 6 ¼ pounds and no more than 150 pounds.

A27.4.2. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside fiber or metal containers, not over 1 ¾ pound capacity each, or cotton bags at least 4-ounce cotton duck not over 25-pounds capacity each. The maximum gross weight must be 140 pounds for DOT 14 and 200 pounds for DOT 15A, 16A, or 19B wooden boxes.

A27.4.3. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside cylindrical fiber cartridge not over 5 inches in diameter nor over 18 inches long, with fiber at least 0.05 inch thick paraffined on outer surface, with joints securely glued or cemented, or strong paraffined paper cartridges not over 12 inches long authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Boxes must be completely lined with strong paraffined paper, or other suitable waterproofed material, without joints or other openings at the bottom or sides. Authorized gross weight must not be over 75 pounds.

A27.4.4. Fiberboard boxes, DOT 12H, 23F, or 23H, with inside cylindrical fiber cartridges not over 5 inches in diameter nor over 18 inches long, with fiber at least 0.05 inch thick paraffined on outer surface with joints securely glued or cemented, or strong paraffined paper cartridges not over 12 inches long authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Authorized gross weight must not be over 65 pounds.

A27.4.5. Black Powder (not low explosive), in addition to containers specified above, may be shipped in the following specification containers:

A27.4.5.1. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside cloth or paper bags not over 25 pounds net weight. The completed shipping package must be capable of withstanding a drop of 4 feet without rupture of inner or outer containers. The completed package must not contain more than 50 pounds net weight of black powder.

A27.4.5.2. Fiberboard boxes, DOT 12H, 23F, or 23H with inside cloth, paper, or securely closed polyethylene bags constructed of material not less than 0.004 inch thick. The maximum net weight must not exceed 25 pounds for cloth or paper bags and 50 pounds for polyethylene bags. Inside fiber or metal containers not over 1 pound net capacity each may be used, provided the completed shipping package is capable of withstanding a drop of 4 feet without rupture of the inner or outer containers. The tubes of the box may be eliminated and a single tube as specified in DOT 23F may be substituted. The completed package must not contain more than 50 pounds net weight of black powder.

A27.4.6. Black pellet powder, primed with the electric squib, secured inside the coaxial hole of the pellet powder (with loose ends of the wire of the squib effectively short-circuited) may be shipped in wooden boxes, DOT 14, 15A, 16A, or 19B with inside strong paraffined paper cartridges not over 12 inches long, and authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Boxes must be lined as prescribed for cylindrical fiber cartridges. Gross weight must be not be over 65 pounds.

A27.4.7. Low explosives (not black powder), in addition to the containers specified, may be shipped in the following specification containers:

A27.4.7.1. Wooden boxes, DOT 14, 15A, 16A, or 19B with strong paper bags not over 25 pounds capacity. Gross weight of DOT 15A or 16A boxes must not be over 200 pounds. Gross weight of DOT 14 box must not be over 140 pounds.

A27.4.7.2. Fiberboard boxes. DOT 12H, 23F, 23H, with inside strong paper bags not over 25 pounds capacity. Gross weight must not be over 65 pounds.

A27.4.7.3. Wooden boxes, DOT 15A or 19B, lined with paper, DOT 2L. Authorized for rods or cylinders not less than five-eighths of an inch in diameter.

A27.5. Detonators, Class A Explosives and Detonators, Class C Explosives. Detonators must fit snugly in strong inside packaging and must be snugly overpacked in outer packagings as specified in **A27.5.7.** and **A27.5.8.** below.

A27.5.1. For devices containing no more than 10 grams of explosives (excluding ignition and delay charges):

A27.5.1.1. No more than 50 devices may be packed in one inside packaging and no more than 500 devices may be packed in one outer packaging.

A27.5.1.2. The gross weight of the completed package must not be over 150 pounds or the gross weight permitted by the specification for the outer packaging used, whichever is less.

A27.5.2. For detonators that are blasting caps (including percussion activated) or delay connectors in metal tubes, the packaging must be as specified below. Also:

A27.5.3. Open ends of any device must be covered with an appropriate cushioning material.

A27.5.3.1. Inside packaging must fit snugly in intermediate packagings consisting of cartons or wrappings made of paper, plastic, or pasteboard.

A27.5.3.2. Intermediate packagings must be separated from the outer packaging by at least 1 inch of cushioning material.

A27.5.4. For devices containing no more than 3 grams of explosives (excluding ignition and delay charges):

A27.5.4.1. No more than 110 devices may be packed in one inside packaging; and,

A27.5.4.2. No more than 5,000 devices may be packed in one outer packaging.

A27.5.5. Detonators that are electric blasting caps, delay connectors in plastic sheaths, or blasting caps with empty plastic tubing containing no more than 3 grams of explosives (excluding ignition and delay charges) must be packed with no more than 100 devices in one inside receptacle and no more than 1,000 devices in one outer container.

A27.5.6. Detonators that are blasting caps with safety fuse, blasting caps with metal clad mild detonating cord, blasting caps with detonating cord, or blasting caps with shock tubes are not required to be attached to the safety fuse, metal clad mild detonating cord, detonating cord, or shock tube, and inside packagings are not required if the packagings configuration restricts freedom of movement of the caps and protects them from impact forces. Quantity limitations do not apply to Detonators, Class C Explosives. Container weight limitations do apply.

A27.5.7. Wooden boxes DOT 14, 15A, 16A, or 19B.

A27.5.8. Fiberboard boxes DOT 12H, 23F, or 23H.

A27.6. Detonating Fuzes, Class A Explosives; Booster, Explosive; Burster, Explosive and Supplementary Charges, Explosive. Package in well secured strong tight wooden or metal boxes approved by military specifications or drawings.

A27.6.1. The gross weight of an outer package containing detonating fuzes, Class A, must not exceed 190 pounds.

A27.6.2. Boosters, bursters, and supplementary charges, without detonators, when shipped separately, must not exceed 300 pounds gross weight.

A27.6.3. A fuze with any radioactive component must also meet requirements of **Attachment 11**.

A27.7. Small Arms Primer; Cannon Primer; Combination Primer; Percussion Cap; Grenades Empty, Primed.

A27.7.1. Package primers (cannon, combination, and small arms), percussion caps, and empty grenades, primed, in strong, tight outside wooden boxes with special provisions for securing the individual packages against movement within the exterior containers.

A27.7.2. Package empty cartridge cases, primed, in strong, tight outside wooden or fiberboard boxes or in DOT21C fiber drums. Each drum must be constructed to the specification requirements for a drum containing at least 250 pounds net weight. Each drum having a metal top or bottom must have a protective corrugated paperboard pad inserted between the contents and the metal.

A27.7.3. Small arms primers containing anvils must be packed in:

A27.7.3.1. Cellular Inside Packages. Packages with partitions separating the layers and columns of the primers so that the explosion of a portion of the primers in the completed shipping packages do not cause the explosion of all primers. They also must be packed in outer packagings as stated in **A27.7.1.** or in fiberboard boxes, DOT 12B, equipped with a corrugated fiberboard liner. The bursting test of the liner must be equal to or over that of the box. The exception is that a liner is not required for a full telescopic style box that may be closed with pressure sensitive tape as specified for DOT 12B. Not more than 5,000 primers may be packed in one outside fiberboard box.

A27.7.3.2. Fiberboard boxes, DOT 23H. Each box must be full depth telescopic style, with top section having extended end flaps and bottom section having extended side flaps, set up without glued or stapled joints. The full height inside perimeter liner, top and bottom pads must be made of doublewall corrugated fiberboard. Hand-holes not more than 4 inches by 1 inch, horizontal with top score line are authorized in the ends of boxes. Package primers in cellular inside packages with partitions separating the layers and columns to form a tight fitting pack in the outer packagings. Do not pack more than 50,000 primers in one outside box.

A27.7.4. Small arms primers and percussion caps may be packed with nonexplosive and nonflammable articles, or with small arms ammunition as provided in **A27.27.** Small arms primers may be included with propellant explosive (solid), class B, in the same outer packagings as provided in **A27.24.2.** The weight of the small arms primers or percussion caps must not exceed 5 pounds per shipping container. Percussion caps must be packaged in metal or other inside boxes. Do not pack more than 500 caps in inside boxes. The construction of the cap or packaging, and the kind and quantity of explosives in each, is such that the explosion of a part of the caps in the completed package does not cause the explosion of all the caps. Package percussion caps in fiberboard boxes, DOT 12B, also:

A27.7.4.1. Do not pack more than 100 caps each in inside metal cans. Not more than 10 metal cans each must then be overpacked in a chipboard box. Pack no more than five chipboard boxes in the 12B fiberboard box. The completed package must be such that an explosion of a part of the caps will not cause the explosion of all the caps.

A27.7.4.2. Pack no more than 100 caps each in inside plastic cans. The plastic cans must then be packed in a chipboard box with not more than eight such chipboard boxes tightly packed in the DOT 12B fiberboard box. The completed package must be such that an explosion of part of the caps will not cause the explosion of all of the caps. The gross weight of one outside package must not be more than 150 pounds.

A27.8. Fuze, Combination; Fuze, Percussion; Fuze, Time; Fuze, Tracer; or Tracer. Package in strong, tight, outside wooden boxes, triple-wall fiberboard boxes, or DOT 23F fiberboard boxes. Special provisions must be made for securing individual packages of fuzes or tracers against movement in the box. The gross weight of each wooden or fiberboard box must not be more than 150 pounds. The gross weight of each DOT 23F fiberboard box must not be over 65 pounds.

A27.9. Common Fireworks, Signal Flares, Hand Signal Devices, Smoke Signals, Smoke Candles, Smoke Grenades, Smoke Pots, and Very Signal Cartridges must be packaged as follows:

A27.9.1. Wooden boxes, DOT 15A, 16A, 19A, or 19B. The gross weight must not be over 100 pounds, however, a gross weight of 500 pounds is authorized for wooden boxes with very signal cartridges only.

A27.9.2. Fiberboard boxes, DOT 12B. The gross weight of fiberboard boxes must not be over 65 pounds.

A27.9.3. Watertight, aluminum drums, 8 inches in diameter, having a rubber gasket and a positive closure. These are authorized only for smoke pots.

A27.9.4. Smoke signals may be packed two each in a Navy-designated preformed polystyrene container banded with pressure-sensitive tape. Pallet loads must have a 2-foot high, ¼-inch plywood border around the lower portion of the load. Each polystyrene case may be overwrapped in a heat-sealed polystyrene bag. The minimum thickness of the bag must be 0.006 inch. Eighteen such containers may be consolidated in a MIL-B-43096, type II, class 2, wirebound wooden box. Each face of the box must be lined with PPP-F-320, type W6C or equal fiberboard.

A27.9.5. Fireworks, such as sparklers, with match tip or head, or similar igniting point or surface, must have each individual tip, head, or similar ignition point or surface entirely covered and securely protected against accidental contact or friction. Except as otherwise specified above, the gross weight of one outside package containing common fireworks must not be over 100 pounds.

A27.10. Cord, Detonating; Fuse, Mild Detonating, Metal Clad; and Flexible Linear Shaped Charges, Metal Clad. Package in wooden or fiberboard boxes or shipping containers approved by military specification or drawings.

A27.11. Detonating, Fuzes, Class C Explosives. Packaging requirements:

A27.11.1. Package in fiberboard boxes, DOT 12H, with or without liners, with well-secured inside paperboard cartons. Suitable filler or lining materials must be used to prevent movement in the box.

A27.11.2. In well-secured, strong, tight outside wooden or metal boxes approved by military specification or drawing. The gross weight of the outside wooden or metal box must not be over 190 pounds.

A27.12. Detonating Primers, Class A Explosives and Detonating Primers, Class C Explosives. Packaging requirements:

A27.12.1. Wooden boxes, DOT 14, 15A, 16A, or 19B, or fiberboard boxes DOT 12H, 23F, or 23H.

A27.12.2. Shipping containers approved by military specification or drawing.

A27.13. Explosive Bomb; Explosive Mine; Explosive Projectile; Explosive Torpedo; Grenade, Hand, Explosive; and Grenade, Rifle, Explosive. Packaging requirements:

A27.13.1. Pack and secure explosive bombs, mines, projectiles, torpedoes, or grenades in strong wooden or metal boxes, except as provided in (2) below.

A27.13.2. Explosive bombs, mines, projectiles, torpedoes, over 90 pounds in weight, and explosive projectiles of not less than 4 ¾ inches in diameter, may be shipped unboxed if securely fastened to pallets or securely blocked and braced.

A27.13.3. Pack and secure bombs, grenades, or projectiles containing gas, smoke, or incendiary charges and bursting charges in strong wooden or metal boxes.

A27.13.3.1. The gross weight of a box containing more than one grenade or mine must not be over 250 pounds.

A27.13.3.2. The gross weight of a shipping container with more than one explosive bomb, warhead, or projectile must not be over 1,400 pounds.

A27.13.4. Package XM47, XM42, XM42E1, and SX54 mine-dispensing subsystem and XM2,XM12, XM12E1, XM12E2/E3, and XM17 canisters in wooden or metal containers. The following special shipping procedures apply:

A27.13.4.1. Wooden containers must not be stacked more than three high with a minimum of 3 feet of space above the top containers. Containers must be positioned in aircraft to allow a minimum of 2 feet of space in front of the container inspection door. Tiedown of containers must be such that access to inspection door is not denied (nets are not considered an obstruction); and

A27.13.4.2. Gross weight of wooden container must not be over 675 pounds.

A27.13.5. BLU 50/B bomblets are packaged in specially designed fiberboard lined plywood boxes. Inside containers consist of ten each bomblets in snug fitting, preformed polyurethane cushioning in a heat-sealed barrier bag.

A27.13.6. Explosive mines may be packaged in metal drums, PA 16, with 14 inside can assemblies with perforated tops, a preformed packing and two base assemblies. Drums must be filled with liquid freon. Two liquid level sight gauges must be located in the top half of the drum for visual monitoring of the liquid level.

A27.13.7. Explosive mines may be packaged in metal drums, PA 17, with inside preformed packing designed to hold mines below liquid freon level. Drums must be filled with liquid freon. Two liquid level sight gauges must be located in the top half of the drums for visual monitoring of the liquid level.

A27.13.8. Package CDU-4/B (SM41E1), CDE-5/B (XM40ES), CDU-10 (XM40ES/SM44) and CDU-14/B (XM64) in wooden boxes approved by military specification or drawing. CDUs must be filled with liquid freon and level electrically monitored.

A27.13.9. Explosive bomb, further described as 7.2 inch projector charge, may be shipped assembled to a 40-by 48 inch steel pallet having a gross weight of approximately 2,000 pounds.

A27.13.10. Package explosive bombs, CBU-55/B, containing explosive components and fuel (ethylene oxide) in a CNU-120/E container.

A27.13.11. Package explosive bombs, CBU-55/B, without fuel, in a CNU-120/E container.

A27.13.12. Explosive bombs, CBU-33/A, may be packed in plastic containers CNU-104/E conforming to MIL-P-22748A, class A, grade 6. Loaded containers must not be over 1,200 pounds gross weight.

A27.14. Explosive Cable Cutters; Explosive Power Device, Class C; Explosive Release Device, or Starter Cartridges, Jet Engine, Class C Explosive. Packaging Requirements:

A27.14.1. Fiberboard boxes, DOT 12H, 23F, or 23H. The maximum gross weight must not be over 65 pounds.

A27.14.2. Wooden or metal boxes must be approved by military specification or drawings. Starter cartridges, jet engine, must have igniter wires short-circuited when packed for shipment.

A27.15. Explosive Rivets. Package explosive rivets, containing not more than 375 milligrams of explosive composition each, in unit containers or paperboard. Pack the unit containers or paperboard in strong wooden, fiberboard or metal containers approved by military specification or drawings.

A27.16. Actuating Cartridges, Explosive, Fire Extinguisher or Actuating Cartridge, Explosive, Valve. Package in strong wooden or fiberboard boxes.

A27.17. Special Fireworks. Packaging Requirements:

A27.17.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. The maximum gross weight must not be over 500 pounds.

A27.17.2. Fiberboard boxes, DOT 12B. The maximum gross weight must not be over 65 pounds. Illuminating projectiles and airplane flares are not permitted in DOT 12B boxes.

A27.17.3. Package flash or spreader cartridges with not more than 72 grains of flash powder in inside fiberboard cartons or tin cans containing not over six cartridges. Pack no more than 150 inside containers in outside DOT 15A, 16A, 19A, or 19B wooden boxes or DOT 12B fiberboard boxes.

A27.17.4. Package assembled flash cartridge consisting of a paper cartridge shell, small arms primer, and flash composition in inside cartons. The flash composition in the one-piece assembled and ready for firing flash cartridge must not be over 180 grains. Do not pack more than 12 cartridges each in the inside cartons. A maximum of 12 inside cartons may be packed in DOT 15A, 15B, 16A, 19A, or 19B wooden boxes or DOT 12B fiberboard boxes. Flash cartridges, in quantities not over 5 pounds, packaged in small interior wooden boxes, may be packed with nonexplosive, nonflammable, and noncorrosive items.

A27.17.5. Unit pack no more than six flash sheets in an inside container. Intermediate pack no more than 12 unit packages in a pasteboard box or carton and packed in a DOT 15A, 16A, 19A, or 19B wooden box or DOT 12B fiberboard box. The gross weight of wooden boxes must not be over 150 pounds. The gross weight of fiberboard boxes must not be over 65 pounds.

A27.17.6. Package photographic flash powder in specification containers as specified in **A27.17.3.**, except the inside container must be strong enough to hold up to 2 ounces each of contents. If bottles are used, each bottle must be packed in a securely closed fiber mailing tube with metal ends. Not more than forty eight 2-ounce bottles may be packed in an exterior wooden box. When packed in units not over 1-ounce each without bottles in similar fiber mailing tubes and exterior wooden boxes, the gross weight of each exterior box must not be over 150 pounds. The gross weight of exterior fiberboard boxes must not be over 65 pounds.

A27.17.7. Package toy torpedoes in wooden boxes, DOT 15A, 15B, 16A, 19A, 19B, or fiberboard boxes DOT 12B containers. Not more than 20 one-quarter gross cartons totaling not more than five gross of toy torpedoes are authorized per fiberboard box. The gross weight of a fiberboard box must not be over 35 pounds. The gross weight of a wooden box must not be over 65 pounds.

A27.17.7.1. Do not pack toy torpedoes of any kind with other fireworks.

A27.17.7.2. Pack toy torpedoes containing a cap in sawdust in inside paper or cardboard cartons. The size of the carton must not be less than 4 cubic inches for each grain of explosive.

A27.17.7.3. Pack toy torpedoes containing a mixture of potassium chlorate, black antimony, and sulfur, in an inner container containing not more than 36 torpedoes. The capacity of this inner container must be at least 105 cubic inches, and it must be divided into 12 equal compartments. All vacant space inside the container must be filled with sawdust or fine shavings.

A27.17.8. Ship distress signals may be packed in outside DOT 12 fiberboard boxes provided:

A27.17.8.1. They are packed in inside metal containers. These containers must be made from at least 24 gauge sheet iron or other metal of equal strength.

A27.17.8.2. The inner container is closed by positive means (not friction).

A27.17.8.3. Inside containers completely fill the outer packaging.

A27.17.8.4. The gross weight is not over 95 pounds.

A27.17.9. Marine location markers (eight each) and aircraft flares (two each) may be packed two each in a Navy-designed, preformed polystyrene container banded with pressure-sensitive tape. Pallet loads must have 2-feet high, ¼-inch plywood border around the lower portion of the load. Polystyrene case may be overwrapped in heat sealed polyethylene bag .006 inch thickness minimum. Consolidate 18 such containers in a wirebound wood box MIL-B-43096, type II, class 2, lined top, bottom and sides with fiberboard, PPP-F-320, grade W6c or equal.

A27.17.10. Illuminating projectiles, incendiary projectiles, and smoke projectiles over 90 pounds in weight each, or of not less than 4 ¾ inches in diameter, may be palletized. Securely block and brace the palletized load according to methods prescribed by the responsible military department. A shipment container is not required.

A27.17.11. Illuminating projectiles, incendiary projectiles, and smoke projectiles less than 4 ¾ inches in diameter may be shipped without being boxed, when palletized and securely blocked and braced with methods prescribed by the responsible military department.

A27.17.12. MK27 Mod O guided missile flares or MK28-3 target flares may be packed in MK2 Mod O metal boxes.

A27.17.13. Practice or exercise warheads containing polytechnics may be shipped two each in a metal box (MK34, Mod O) with a gross weight over 65 pounds.

A27.17.14. Flares may be packed in flame-retardant polystyrene cases. The polystyrene cases must be shipped palletized, covered with plywood or wirebound sheathing secured with steel strapping.

A27.18. High Explosives.

A27.18.1. High explosives, consisting of a liquid mixed with an absorbent material, must have the absorbent (wood pulp or similar material) in sufficient quantity and be of satisfactory quality, and properly dried at the time of mixing. Nitrate of soda must be dried at the time of mixing to less than 1 percent of moisture; and the ingredients must be uniformly mixed so that the liquid will remain thoroughly absorbed under the most unfavorable atmospheric conditions incident to transportation.

A27.18.2. High explosives containing nitroglycerin or other liquid explosive ingredients must be uniformly mixed with an absorbent material and a satisfactory antacid. The antacid must be in sufficient

quantity to have the neutralizing power of an amount of magnesium carbonate equal to 1 percent of the nitroglycerin or other liquid explosive ingredient.

A27.18.3. High explosive cartridges consist of a column of explosives completely enclosed in a shell made of strong paper or polyethylene or a combination of paper and polyethylene, treated so that it will not absorb the liquid ingredient of the explosive.

A27.18.4. High explosive packaged bags made of strong paper of equally efficient material so treated or of such nature that it will not absorb the liquid ingredient of the explosive.

A27.18.5. High explosives packed in boxes which must be lined with strong, paraffined paper or other suitable material. The lining must be without joints or other openings or with cemented joints at the bottom, ends, or sides of the boxes. For explosives with liquid ingredients, the lining must be impervious to such ingredients and also to water. Box covers must be protected from contact with explosives by lining paper or other suitable material.

A27.18.6. Gelatine explosives in cartridges or bags must also have dry fine wood pulp or sawdust at least ¼ of an inch in depth spread over the bottom of the box or the bottom of the box may have a full area pad formed of an absorptive cellulose sheet which has a nitroglycerin absorptive value equivalent to sawdust as specified. Similar materials are required in boxes for packing all non-gelatinous types of explosives containing 30 percent or more of liquid explosive ingredient.

A27.18.7. Except for high explosive (gelatin dynamite) in cartridges, all cartridges of high explosives exceeding 4 inches in length and containing more than 10 percent of a liquid explosive ingredient must be placed horizontally in boxes. Pack bags with their filling holes up.

A27.18.8. Prevent movement of high explosives contained in cartridges and bags within the boxes by sufficiently tight packing.

A27.18.9. High explosive (dynamite), except gelatin dynamite, packed in bags or in cartridges over 2 inches in diameter and containing not more than 30 percent liquid explosive ingredients may be packed in outer packagings without sawdust and without lining paper, provided each inside or outer packaging is siftproof and is treated to prevent penetration by the commodity with which the container is filled for shipping.

A27.18.10. Liquid High Explosives Must Be Packed In DOT 15L wooden boxes and DOT 15M wooden boxes. The inside metal containers in the DOT 15M containers cannot contain more than 10 quarts of liquid explosives each.

A27.18.11. High Explosives with Liquid Explosive Ingredients.

A27.18.11.1. Package high explosives (dynamite) containing no more than 30 percent liquid explosive ingredients in the following specification containers.

A27.18.11.1.1. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. The gross weight of the boxes must not be over 65 pounds.

A27.18.11.1.2. Wooden boxes, DOT 14, 15A, 16A, 19B or fiberboard boxes, DOT 12H, 23F, or 23H with inside containers, which must be cartridges or bags. Inside cartridges must not be more than 12 inches in diameter by 36 inches in length or 50 pounds gross weight. Inside bags not over 50 pounds must be securely closed to prevent leakage of contents. The gross weight of wooden boxes must not be over 75 pounds and the gross weight of fiberboard boxes must not be more than 65 pounds.

A27.18.11.1.3. Fiberboard boxes, DOT 23F or 23H, having one inside 26-gauge metal container, measuring not over 8 inches in diameter and 31 inches in length, containing high explosives (ammonium dynamite core) surrounded by a blasting agent. Gross weight must not be more than 65 pounds.

A27.18.11.2. High explosives (dynamite) containing 10 percent or less of a liquid ingredient must be prepared for shipment as follows:

A27.18.11.2.1. Packed in DOT 14, 15A, 16A, or 19B wooden boxes or in DOT 12H, 23F, or 23H fiberboard boxes. The gross weight must not be more than 140 pounds.

A27.18.11.2.2. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. The gross weight of the box must not exceed 65 pounds.

A27.18.11.3. Pack high explosives (dynamite) containing more than 30 percent liquid explosive ingredients in specification containers as follows:

A27.18.11.3.1. Wooden boxes (maximum gross weight 75 pounds), DOT 14, 15A, 16A, or 19B or fiberboard boxes, DOT 12H, 23F, or 23H, with inside containers that consist of:

A27.18.11.3.1.1. Cartridges not over 4 inches in diameter and not over 8 inches in length.

A27.18.11.3.1.2. Cartridges having a diameter of 4 to 5 inches and between 8 and 10 inches in length must be redipped in melted paraffin or equivalent material.

A27.18.11.3.1.3. Two or more cartridges that must be redipped because of their size must be enclosed in another strong paper shell to form a completed cartridge not more than 30 inches in length. The resulting cartridge must be dipped in melted paraffin or equivalent.

A27.18.11.3.1.4. The gross weight of wooden boxes must not be more than 75 pounds and the gross weight of fiberboard boxes must not be more than 65 pounds.

A27.18.11.3.2. In wooden or fiberboard specification boxes as prescribed inside containers may be paper or polyethylene bags meeting the following conditions:

A27.18.11.3.2.1. Paper bags: .

A27.18.11.3.2.1.1. Must be paraffined two-ply paper not over 12 ¾ pounds capacity, securely closed by folding the tops and securing the fold by tape.

A27.18.11.3.2.1.2. Must insert no more than two such bags into another two-ply paper bag that must be securely closed and dipped in paraffin after closing.

A27.18.11.3.2.2. Polyethylene bags

A27.18.11.3.2.2.1. Must not be less than 0.0004 inches in thickness and no more than 12 ¾ pounds capacity each.

A27.18.11.3.2.2.2. Must not be more than two such securely closed bags packed in an intermediate polyethylene or paper bag. Securely close the polyethylene or paper bag and pack in polyethylene lined outside fiberboard boxes.

A27.18.11.3.2.3. The gross weight of wooden boxes must not be over 75 pounds, and the gross weight of fiberboard boxes must not be over 65 pounds.

A27.18.11.4. High explosives (gelatin dynamite and blasting gelatin) packed in specification containers as follows:

A27.18.11.4.1. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. Gross weight of boxes must not be over 65 pounds.

A27.18.11.4.2. Wooden boxes, DOT 14, 15A, 16A, or 19B or fiberboard boxes, DOT 12H, 23F, or 23H with inside cartridges or bags. The cartridges must not be more than 12 inches in diameter by 36 inches in length or 50 pounds in weight. Bags not completely sealed against leakage must be packed with filling holes up. The gross weight for wooden boxes must not be over 75 pounds, and the gross weight of fiberboard boxes must not be over 65 pounds.

A27.18.11.4.3. High explosives (straight gelatin dynamite of 80 percent strength and over and blasting gelatin) are packed in cartridges, or in bulk in outside boxes. When packed in bulk, boxes must be double lined throughout with paper and packed in wooden boxes, DOT 14, 15A, 16A, or 19B or 23 H. Pack DOT 23G fiberboard boxes in an outer container consisting of at least seven-ply heavy kraft paper. Two 3-mil polyethylene bags, one within the other, may be used in place of the double-lining paper when a DOT 12H is the outer packaging. Not more than one such double bag may be packed in DOT 12H fiberboard box. The gross weight of wooden boxes must not be more than 75 pounds and the gross weight of fiberboard boxes must not be over 65 pounds.

A27.18.12. High explosives with no liquid explosive ingredient and propellant explosives, class A. Packaging requirements:

A27.18.12.1. Wooden boxes, DOT 14, 15A, 16A, or 19B. The gross weight must not be more than 140 pounds.

A27.18.12.2. Fiberboard boxes, DOT 12H, 23F, or 23H. The gross weight must not be more than 65 pounds.

A27.18.12.3. Boxes must have an inside polyethylene bag having a minimum thickness of 6 mils, or must be lined with strong paraffined paper or other authorized material, DOT 2L. When such explosives contain over 5 percent moisture, boxes with handholes are not authorized.

A27.18.12.4. Outside boxes. When such explosives are in combination cartridges, consisting of a column of explosive with core of dynamite, they may be shipped when packed in outside boxes. The gross weight must not be over 65 pounds. The column of explosives must be completely enclosed in waterproofed cloth or waterproofed paper, and must not be more than 6 inches in diameter, 2 inches in length, or 25 pounds gross weight.

A27.18.12.5. Fiberboard boxes, DOT 23G. Gross weight of the box must not be over 65 pounds. The high explosives sensitiveness to percussion must not be greater than that measured by the blow delivered by an 8 pound weight dropping from a distance of 7 inches on a compressed pellet of the explosive 0.03 inch thick and 0.2 inch diameter. The compressed pellet is confined rigidly between hard steel surfaces as in standard Impact Testing Apparatus of the Bureau of Explosives during the test. Pack the high explosives in cartridges when their sensitiveness is greater than the limit prescribed herein. Such explosives, when dry, may be packed in strong siftproof cloth or paper bags of capacity not be over 25 pounds.

A27.18.13. High explosives with no liquid explosive ingredient nor any chlorate. Pack in one of the following outer containers:

A27.18.13.1. When high explosives contain over 5 percent moisture, the box must have an inside securely closed polyethylene bag having a minimum thickness of 6 mil; or the box must have a DOT 2L lining. Polyethylene is authorized only for materials that do not react with or cause decomposition of the plastic.

A27.18.13.2. When high explosives are in combination cartridges, consisting of a column of explosives with a core of dynamite, they may be packed in exterior containers with 65 pounds as the maximum gross weight. Completely enclose the column of explosives in waterproofed cloth or strong waterproofed paper, not more than 6 inches in diameter, 20 inches in length, or a gross weight of 25 pounds.

A27.18.13.3. Sensitiveness to percussion is not greater than that measured by the blow delivered by an 8-pound weight, dropping from a distance of 7 inches, or compressed pellet of the explosive 0.03-inch thick and 0.20-inch diameter, confined rigidly between hard steel surfaces as in the Standard Impact Testing Apparatus of the Bureau of Explosives. The requirement of packaging in cartridges, bags, or metal containers does not apply to plastic-bonded explosives. Pack and cushion to prevent movement of individual pieces within the outside shipping container. Pack in cartridges when their sensitiveness is greater than the limit prescribed in this section. Such explosives, when dry may be packed in strong siftproof bags, securely closed to prevent leakage, or in metal containers of capacity not over 60 pounds.

A27.18.13.4. Wooden boxes, DOT 14, 15A, 16A, or 19B. Gross weight must not be over 140 pounds. Wooden boxes, having inside metal containers that are tightly and securely closed, may be equipped with handholes in each end that must not be more than 1- by 4-inches and centered laterally not nearer than 1 5/8 inches from top edge of box.

A27.18.13.5. Fiberboard boxes, DOT 12H, 23F, 23G, or 23H. Gross weight must not be over 65 pounds.

A27.18.13.6. Metal drums (single-trip) DOT 17H or 37A having a minimum 0.003-inch thick polyethylene liner. Authorized only for Ammonium Perchlorate with particle size of 5 to 15 micrometers. Maximum capacity is 30 gallons.

A27.18.14. Amatol consisting of 80 percent ammonium nitrate and 20 percent Trinitrotoluene, Ammonium Picrate, Nitroguanidine, Nitrourea, Urea Nitrate, Picric Acid, Tetryl, Trinitroresorcinal, Trinitrotoluene, Pentolite, Cyclotrimethylentrinitramine (desensitized), and Soda Amatol, in dry condition, may be shipped in containers with the following specifications:

A27.18.14.1. Those described in **A27.18.13.**

A27.18.14.2. Wooden boxes, DOT 14, 15A, 16A, or 19B, with strong paper or cloth bags of capacity not over 50 pounds, packed with filling holes up.

A27.18.14.3. Fiber drums, DOT 21C. Net weight not over 200 pounds.

A27.18.15. Trinitrotoluene and Pentolite in dry condition.

A27.18.15.1. Packed in containers described in **A27.18.13.**

A27.18.15.2. Packed in containers described in **A27.18.14.**

A27.18.15.3. Wooden boxes, DOT 14, 15A, 16A, 19B, or with strong paper or cloth bags of capacity not over 100 pounds, packed with filling holes up.

A27.18.15.4. Wooden boxes, DOT 14, 15A, 16A, or 19B, with strong siftproof liners, DOT 2L.

A27.18.15.5. Fiber drums, DOT 21C. Net weight must not be over 200 pounds.

A27.18.15.6. The following materials may be shipped dry, in quantity not more than 4 ounces in one outside package for medical purposes or as reagents, as drugs, medicines, or chemicals without other restriction, when in securely closed bottles or jars properly cushioned to prevent breakage:

A27.18.15.6.1. Ammonium picrate

A27.18.15.6.2. Dipicrylamine

A27.18.15.6.3. Dipicrly sulfide

A27.18.15.6.4. Dinitrophenylhydrazine

A27.18.15.6.5. Nitroguanidine

A27.18.15.6.6. Picramide

A27.18.15.6.7. Picric acid

A27.18.15.6.8. Picryl chloride

A27.18.15.6.9. Trinitroansisole

A27.18.15.6.10. Trinitrobenzene

A27.18.15.6.11. Trintrobenzoic acid

A27.18.15.6.12. Trinitro-m-cresol

A27.18.15.6.13. Trinitronaphthalene

A27.18.15.6.14. Trinitroresorcinol

A27.18.15.6.15. Trinitroltoluene

A27.18.15.6.16. Urea nitrate

A27.18.15.6.17. Triaminotrinitrobenzene

A27.18.15.6.18. Trichlortrinitrobenzene

A27.18.15.6.19. Hexanitrostilbene

A27.18.16. Ammonium Picrate, Picric Acid, Urea Nitrate, Trinitrobenzene, Trinitroresorcinol, Trinitrotoluene, Cyclotrimethylenetrinitramine, Cyclotetra-methylenetetranitramine, Pentaerythrite Tetranitrate (desensitized), or Trinitrobenzoic Acid when wet with not less than 10 pounds of water to each 90 pounds of dry material must be shipped in containers to comply with the following specifications:

A27.18.16.1. Metal barrels or drums, DOT 5B, or fiber drums, DOT 2C. Authorized only for Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetrainitramine, wet with not less than 10 pounds of water to each 90 pounds of dry material in inside containers which must be bags made of at least 10-ounce cotton duck rubber or rubberized cloth, and securely closed. The dry weight of Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetranitramine in one metal barrel or drum must not be more than 300 pounds and not more than 225 pounds in fiber drums. These bags con-

taining the Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetranitramine each must then be placed in a rubber bag, rubberized cloth bag, or bag made of suitable watertight material that must be securely closed and then placed in the drum. If shipment of cyclotrimethylenetrinitramine is to take place at a time freezing weather is anticipated, it must be wet with a mixture of denatured ethyl alcohol or other suitable antifreeze and water of such proportions that freezing will not occur in transit.

A27.18.16.2. Fiber drum, DOT 21C, with inside polyethylene bag having 0.004 inch minimum thickness and liquid tight closure. Net weight must not be over 200 pounds. Authorized only for wet desensitized Pentaerythrite Tetranitrate.

A27.18.17. Amatol when cast or compressed in a solid block or column, in addition to containers prescribed in **A27.18.5.** may be shipped in metal drums, DOT 13A, not over 90 pounds gross weight.

A27.18.18. Pack nitrocellulose in wooden boxes complying with DOT 14, 15A, 16A, or 19B, with inside packages that must be:

A27.18.18.1. Wrapped in strong paraffined paper or suitable sparkproof material, when containing not more than 1 pound each of dry, uncompressed nitrocellulose. Completed outside package must not contain more than 10 pounds of dry nitrocellulose.

A27.18.18.2. Wrapped in strong paraffined paper when containing compressed sticks or blocks of dry nitrocellulose. Gross weight must not be over 75 pounds.

A27.18.19. Shaped charges, commercial, having exposed lined conical cavities that are covered will be paired together with the cavities facing each other and with one or more pairs in a fiber tube, or so arranged that the conical cavities of the shaped charges at the ends of the column face toward the center of the tube. The shaped charges in the fiber tubes must fit snugly with no excess space in the outer packaging. Shaped charges, commercial, must be packed in specification containers as follows:

A27.18.19.1. Wooden boxes, DOT 14, 15A, 16A, or 19B; gross weight must not be over 140 pounds.

A27.18.19.2. Fiberboard boxes, DOT 12H, 23F, or 23H; gross weight must not be over 65 pounds.

A27.18.19.3. Fiberboard boxes, DOT 12B; at least 275 pounds test double-wall corrugated fiberboard, with double-faced corrugated lining board having minimum test of 200 pounds. Individual charges of explosives must be packed in inside securely closed, waterproof plastic containers, or in securely closed waterproof container having metal ends. Inside individual containers must be separated by means of double-faced corrugated fiberboard partitions of material not less than 175 pounds (Mullen or Cady). Gross weight must not be over 65 pounds.

A27.18.19.4. Specially designed Navy steel cylindrical containers possessing a shock mitigation system. One each charge, to a container: four containers properly strapped or banded to a pallet.

A27.18.20. Cyclotrimethylenetrinitramine (RDX) (desensitized) in pellet form, dry may also be packed in specification containers as follows:

A27.18.20.1. Wooden box, DOT 15A or 19B, for pellets ¼ of an inch or less in diameter. Pellets must be packed in a slide-type fiber container with perforated fillers. All openings of the container must be securely closed with pressure-sensitive tape. Inside containers must be cushioned with at least 2 inches of sawdust between inner and outer containers. No inside container may contain

more than ¾ pound net weight of explosive composition, and not more than 10 pounds of net weight explosive composition must be packed in one outside box.

A27.18.20.2. Wooden box, DOT 15A or 19B, for pellets exceeding ¼ inch in diameter. Pellets must be packed in a fiber tube with positive closures at both ends, and must be packed in a fiber container having not more than ¾ pound net weight of explosive composition. Inside containers must be cushioned with at least 2 inches of sawdust between inner and outer containers. Not more than 10 pounds of net weight of explosive composition must be packed in one outer packaging.

A27.18.21. Conversion kits, containing Comp. A-3 pellets, must be packed eight each to a fiberboard lined, metal ammunition components box, MK2. Kit components and separately packaged pellets must be securely nested within fiberboard separators in inside fiberboard boxes.

A27.19. Igniter Cord. Pack in strong, tight, outside fiberboard boxes or drums, wooden boxes, or metal containers.

A27.20. Initiating Explosive.

A27.20.1. Diazodinitrophenol or Lead Monoitroresorcinate. Packaged wet with not less than 40 percent by weight of water in:

A27.20.1.1. Metal barrels or drums, DOT 5 or 5B, with inside bags made of at least 10-ounce cotton duck, rubber, or rubberized cloth, which must be securely closed. The dry weight of Diazodinitrophenol in one container must not be more than 220 pounds, and the dry weight of lead Mononitroresorcinate in one container must not be over 100 pounds. The bags containing Diazodinitrophenol must be placed in a rubber bag, rubberized cloth bag, or bag made of suitable watertight material, and then placed in the barrel or drum. Any empty space in the outside bag must be filled with water, and this bag securely closed. Sufficient outage in the outer packaging must be allowed to prevent rupturing of the container in freezing weather, or a mixture of denatured alcohol and water may be used to prevent freezing in transit.

A27.20.1.2. Fiber drums, DOT 21C, not over 30-gallon capacity of at least 9-ply construction having in addition, a sheet of steel having a minimum base box of 75 pounds, not less than .008-inch thick, wound between the fifth and sixth plies. The inside ply of kraft paper must be laminated on each side with polyethylene to form a waterproof lining. The bottom head must be of fiber, metal covered on the outside, and must be attached to the body to form a watertight joint.

A27.20.1.2.1. Lead Mononitroresorcinate must only be packed wet, with not less than 40 percent by weight of water, and must be contained in at least two tightly sealed polyethylene bags of at least 0.004-inch thickness; this unit must then be placed in a tightly closed polyethylene bag of at least 0.004-inch thickness, and this assembly must be placed within a 0.006-inch thickness polyethylene (or other suitable plastic bag) completely filled with water and tightly closed. The 0.006-inch plastic bag must be of such a size as to completely fill the outside shipping container. The dry weight of lead Mononitroresorcinate only in one outer packaging must not be more than 100 pounds.

A27.20.2. Guanyl Nitrosomino Guanylidene Hydrazine. Packed wet with not less than 30 percent by weight of water in metal barrels or drums, DOT 5 or 5B, with inside containers which must be a bag made of 4-ounce duck. Inside the bag, and over the Guanyl Nitrosamino Guanylidene Hydrazine, there must be placed a cap of the same fabric, of the same diameter as the bag. The gag must be

securely tied and placed in a strong grain bag and securely tied. The dry weight of Guanyl Nitrosamino Guanylidene Hydrazine in one container must not be over 75 pounds. The bag and contents must be packed in the center of the wooden barrel or keg, metal barrel or drum, and must be entirely surrounded by not less than 3 inches of well packed sawdust saturated with water. The wooden barrel or keg, or metal barrel or drum, must be lined with a heavy close-fitting jute bag, closed by secure sewing to prevent escape of sawdust. The barrel, keg, or drum must be inspected carefully and all leaks stopped. If freezing temperature is anticipated during shipment, use a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur during transit.

A27.20.3. Lead Azide (dextrinated type or otherwise prepared to effectively control grain size). Packed wet with not less than 20 percent by weight of water. Containers, packaging, and procedures are the same as prescribed in **A27.20.2.** except that the dry weight of Lead Azide in one container must not be over 150 pounds. The same freezing precautions apply.

A27.20.4. Lead Styphnate (Lead Trinitrosorcinate) or Barium Styphnate, Monohydrate. Packed wet with not less than 20 percent by weight of water in metal barrels or drums, DOT 5, 5B, or 17H with inside containers that must be a bag of rubber or rubberized cloth.

A27.20.4.1. The Lead Styphnate or Barium Styphnate, Monohydrate within this bag should be divided into a number of smaller packages. There must be a cap of the same material and of the same diameter as the bag over the Lead Sytphnate and inside the bag.

A27.20.4.2. The dry weight of Lead Styphnate or Barium Styphnate, Monohydrate in one outer container must not be over 150 pounds. The bag and contents must be packed in the center of the metal barrel or drum, and must be entirely surrounded by not less than 3 inches of well packed sawdust saturated with water.

A27.20.4.3. The metal barrel or drum must be lined with a heavy, close-fitting, jute bag closed by secure sewing to prevent escape of sawdust. The barrel or drum must be inspected carefully and all leaks stopped.

A27.20.4.4. If freezing temperature is anticipated during shipment, use a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur during transit.

A27.20.5. Nitro Mannite. Packed wet, with not less than 40 percent by weight or water container and packaging procedures are the same as **A27.20.1.** except that the dry weight of Nitro mannite in one container must not be over 100 pounds. The same freezing precautions apply.

A27.20.6. Nitrosoguanadine. Packed wet with not less than 10 percent by weight of water in metal barrels or drums, DOT 5, 5B, or 17H with inside strong cloth bag. The dry weight of Nitrosoguanidine in one container must not be over 75 pounds.

A27.20.7. Pentaerythrite Tetranitrate. Packed wet with not less than 40 percent by weight of water. Container and packaging procedures are outlined in **A27.20.1.** Except that the dry weight of Pentaertythrite Tetranitrate in one container must not be over 300 pounds. The same freezing precautions apply.

A27.20.8. Tetrazene. Packed wet with not less than 30 percent by weight of water. Container and packaging are the same as **A27.20.2.** The dry weight in one container must not be more than 75 pounds. The same freezing precautions apply.

A27.20.9. Fulminate of Mercury. Packed wet with not less than 25 percent by weight of water in DOT 5, 5B, or 17H metal drums or barrels with inside bag made of 4-ounce duck.

A27.20.9.1. Inside the bag and over the Fulminate, there must be placed a cap of the same fabric and of the same diameter as the bag. The bag must be securely tied and placed in a strong grain bag. This grain bag must also be securely tied.

A27.20.9.2. The dry weight of Fulminate in one container must not be over 150 pounds. Pack the bag and contents in the center of the wooden barrel, keg, or drum, entirely surrounded by not less than 3 inches of well-packed sawdust saturated with water.

A27.20.9.3. The barrel or drum must be lined with a heavy, close fitting jute bag closed by secure sewing to prevent escape of sawdust. Inspect the barrel or drum carefully, to stop all leaks.

A27.20.9.4. If shipment of Fulminate of Mercury is to take place at a time that freezing weather is to be anticipated, use a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur in transit.

A27.21. Rocket motors; Jet Thrust Units; Igniters, Rocket Motors; or Igniters, Jet Thrust (Class A Explosives). Package in:

A27.21.1. Wooden boxes or wooden boxes fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B.

A27.21.2. Metal Containers, MIL-D-6054 or other metal containers approved by the DOT.

A27.21.2.1. Igniters or igniter components may be shipped in the same outer packaging with the rocket motor or jet thrust unit if separately packed in unit package (metal can, fiberboard box, etc).

A27.21.2.2. Rocket motors must be shipped in nonpropulsive state. When military air shipment of a rocket motor in a propulsive state is required, the shipper must obtain written approval from hazard classification authority listed in TB 700-2/NAVSEAINST 8020.8B/T.O. 11A-1-47/DLAR 8220.1, DOD Explosive Hazard Classification Procedures.

A27.22. Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors, Igniters, Rocket Motors; Igniters, Jet Thrust; Igniters, Ramjet Engine (Class B explosives) or Starter Cartridge, Jet Engine. Package requirements:

A27.22.1. Wooden boxes or wooden boxes fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B. Packages containing igniters, ramjet engines must not be over 500 pounds gross weight.

A27.22.2. Wooden boxes, DOT 15B, authorized only for igniters, jet thrust (jato) class B or igniters, rocket motor igniters, ramjet engine, class B explosive. Packages containing igniters, ramjet engine must not be over 500 pounds gross weight.

A27.22.3. Service-designated and NAVAIR/NAVSEA-approved wood or metal containers identified by Ordinance Requirement (OR), MIL-STD, or other appropriate container document, and a letter container designated, such as MK and MOD or CNU numbers.

A27.22.4. MIL-D-6054 drums (MS 63052) with specially designated interior blocking and bracing. Authorized for jet thrust units, class B explosives only.

A27.22.5. LAU-10/A Launcher, using unit load adapterMK58, MOD 1 and palletized with WR-54/115C, which consists of 16 units per shipment of rocket motors, class B explosives.

A27.22.6. MK4 metal container with properly designed interior mounting or blocking supports. Authorized for packed one each M77A1 rocket.

A27.22.7. Fiberboard box, DOT 23F, authorized for Igniters, Jet Thrust (jato), Class B, Igniters, Rocket Motor, Class B, or Starter Cartridges, Jet Engine, Class B only which must be packed in tightly closed inside fiberboard boxes, at least 200 pound test (Mullen or Cady), or metal containers. Starter Cartridges, Jet Engine, must have igniter wires short-circuited when packed for shipment.

A27.22.8. Wooden boxes, specification MIL-B-2427, Grade A, Style 4, Type II, containing eight igniters packed one each in inside hermetically sealed metal containers.

A27.22.8.1. Igniters or igniter components may be shipped in the same container with jet thrust units. When approved by military specifications or drawings.

A27.22.8.2. Rocket motors must be nonpropulsive in shipment. When military air shipment of a rocket motor in a propulsive state is required, the shipper must obtain written approval from hazard classification authority listed in TB 70-2/NAVSEAINST 8020.3/T.O. 11A-1-47/DLAR 8220.1, DOD Explosive Hazard Classification Procedures.

A27.23. Railway Torpedoes. Packaging Requirements:

A27.23.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B are authorized; however, the net weight in wooden boxes must not be over 125 pounds.

A27.23.2. Fiberboard boxes, DOT 12H, 23F, or 23H are authorized; however, the gross weight must not be over 65 pounds.

A27.23.3. Fiberboard boxes, DOT 12B, with inside cartons are authorized. The inside cartons must not contain over 72 track torpedoes each. The gross weight of the exterior fiberboard box must not be over 65 pounds.

A27.23.4. Fiberboard boxes, DOT 12B, without inside containers may be used for not more than 50 track torpedoes provided the smallest dimension of the box is at least 6 inches.

A27.24. Propellant Explosives, Solid or Liquid (Class A or B Explosives). Package Requirements:

A27.24.1. Tight metal cases in tight wooden boxes free from loose knots and cracks, or tight metal containers. Gross weight must not be over 200 pounds.

A27.24.2. Wooden boxes, DOT 14, 15A, or 19B metal lined DOT 2F. Gross weight must not be over 200 pounds.

A27.24.3. Wooden boxes, DOT 14, 15A, 19B, or fiberboard boxes, DOT specifications 23F, or 23H, with inside cloth or paper bags of capacity must not be over 25 pounds net weight. Each bag must be capable of withstanding, when filled, at least 2 drops on end from a height of 4 feet without breaking or sifting of contents. Net weight of contents in outer packaging must not be over 50 pounds.

A27.24.4. Wooden boxes, DOT 14, 15A, 15B, 15C, 19B, or fiberboard boxes, DOT 12B, or 23H, with inside containers that must be DOT 13 metal kegs. Fiberboard boxes must contain not more than six metal kegs not over 5 pounds net weight each in one outer packaging. Gross weight of wooden boxes must not be over 200 pounds, and fiberboard boxes must not be more than 65 pounds.

A27.24.5. Wooden boxes, DOT 14, 15A, 15B, 15C, or 19B fiberboard boxes, DOT 23F or 23H, with inside strong metal containers. A maximum of four inside containers must not be more than 25 pounds each. Gross weight of fiberboard boxes must not be more than 65 pounds.

A27.24.6. Fiber drums, DOT 21C. Drums having wooden heads must contain a strong sift-proof liner. Authorized net weight not over 265 pounds.

A27.24.7. Wooden boxes, DOT 14, 15A, 16A, or 19B not lined, authorized only for grains not less than 1 inch in diameter or 3 inches in length, provided such grains are tightly packed and are coated with a protective material. Gross weight must not be over 200 pounds.

A27.24.8. Other wooden boxes and fiberboard boxes approved by the military services may be used instead of DOT specification containers.

A27.24.9. Wooden boxes, DOT 14, 15A, 15B, 19B, or fiberboard boxes, DOT 12H, 23F, or 23H with inside fiber or metal containers of not more than a 1 ¾ pound capacity each. Gross weight of wooden boxes must not be over 200 pounds, and fiberboard boxes must not weigh over 65 pounds.

A27.24.10. Conversion kits, containing Propellant Explosives, Class A, are packed eight each to a fiberboard lined, metal ammunition components box, MK2. Kit components and separately packaged pellets must be securely nested within fiberboard separators.

A27.24.11. Fiberboard boxes, DOT 12H, 23G, or 23H with inside securely closed polyethylene bags having a minimum wall thickness of 6 mils.

A27.24.11.1. Propellant Explosives (Smokeless Powder for Cannon or Small Arms) in water, must be packed in containers to comply with the following specifications:

A27.24.11.2. Metal barrels or drums, DOT 5, 5A, 5B, 6B, or 6C.

A27.24.11.3. Wooden boxes, DOT 15A or 19B, metal lined DOT 2F.

A27.24.12. Pack Propellant Explosives (liquid) in specific containers as follows:

A27.24.12.1. Wooden boxes or wooden boxes fiberboard lined, DOT 15A, 15B, or 15E, with inside polyethylene bottles having taped screw cap closures, not over 1-gallon capacity each. Each bottle must be entirely contained within a polyethylene or other suitable plastic bag formed of material not less than 0.004-inch thickness, with ends securely closed. Each bottle in the plastic bag must be enclosed in a tight metal container, and be surrounded on all sides with at least 2 inches of incombustible cushioning material. Cans in the outside box must also be cushioned from each other and the sides, top, and bottom of the container.

A27.24.12.2. Metal barrels or drums, DOT 5B, 6B, 6C, 6D, or 17C, with inside polyethylene, DOT 2S, container packed inside a strong, tight metal drum and securely closed, or inside glass-lined aluminum carboy not over a 12-gallon capacity. Inside steel or glass-lined carboy must be surrounded on all sides with at least 2 inches of incombustible absorbent cushioning material uniformly distributed. Polyethylene containers are authorized only for liquids that do not react dangerously with plastic or result in container failure. Containers must not be entirely filled; sufficient interior space must be left vacant to prevent leakage or distortion of containers due to expansion of the contents from increased temperatures during transit.

A27.24.13. Propellant Explosives (solid) with small arms primers, must be packed as follows:

A27.24.13.1. Inside containers must be tightly closed metal cans or fiber containers, not over 1-pound each or not containing more than one-grain of propellant (not exceeding 5 pounds each). The inside container must be packed to prevent movement within the outer packaging.

A27.24.13.2. Not more than 1,000 small arms packed as prescribed in **A27.7.3.** may be included in one outside shipping container with solid propellant explosives. The inside container must be packed to prevent movement within outer packaging.

A27.24.13.3. Wooden boxes, DOT 15A, 15B, 15C, or 19B.

A27.24.13.4. Fiberboard boxes, DOT 12B, 23F, or 23H. Not more than 10 pounds of propellant explosives may be shipped in one outer packaging.

A27.24.14. Document destroyer with starter must be packaged as follows:

A27.24.14.1. Metal or fiber drums with inside containers and items consisting of five 20-pound packages of sodium nitrate in kraft bags lined with polyethylene; 2 pounds of sodium nitrate, 0.2-0.4 percent Anticaking Tricalcium Phosphate, and 2 pounds of sugar mixed with ¼ pound of charcoal in kraft bags lined with polyethylene; Two Igniter Incendiary M-25 consisting of the M-201A1 fuse adapted to the M-1 fire starter approximately 1 inch in diameter by 2 ¾ inches high cellulose acetate body filled with petroleum jell; one 24-inch two mesh wire screen; safety matches. Net weight of contents must not be more than 120 pounds.

A27.24.14.2. Metal drums (Army drawing D-4 11-34) with inside fiber drums and items consisting of sodium nitrate, a 2-inch tube filled with charcoal, sodium nitrate, and sugar. The inside drum is positioned to form a 2-inch annulus which is filled with sodium nitrate.

A27.25. Rocket Ammunition with (Inert Loaded Projectiles, Solid Projectiles, Empty Projectiles, Explosive Projectiles, Gas Projectiles, Smoke Projectiles, Incendiary Projectiles, or Illuminating Projectiles). Pack in strong wooden or metal containers or aluminum containers approved by military specification or drawings.

A27.26. Small Arms Ammunition and Small arms Ammunition, Tear Gas Cartridges. Pack in pasteboard or other inside boxes, or in partitions designed to fit snugly in the outer packaging, or pack in metal clips. The partitions and metal clips must be designed to protect the primers from accidental damage. The inside boxes, partitions, and metal clips must be packed in securely closed strong outside wooden or fiberboard boxes or metal containers. Blank industrial power load cartridges may be packed in bulk in securely closed fiberboard boxes.

A27.27. Toy Caps. Toy caps must not contain more than an average of ¼ grain of explosive composition per cap, and must be packed in inside packages constructed of paperboard not less than 0.013-inch thick, or metal not less than 0.008-inch thick, or noncombustible plastic not less than 0.015-inch thick. The material must provide a complete enclosure, and the minimum dimensions of each side or end of such package must be not less than 1/8 of an inch in height. The number of caps in an inside package must be limited so that not more than 10 grains of explosive composition is packed into 1 cubic inch of space, and not more than 17.5 grains of explosive composition of toy caps is packed in any inside container.

A27.27.1. Pack Toy Caps In:

A27.27.1.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. Gross weight must not be over 150 pounds.

A27.27.1.2. Fiberboard boxes, DOT 12B. Gross weight must not be over 65 pounds.

A27.27.1.3. Wooden boxes in good condition, and weighing not more than 100 pounds gross.

A27.28. Explosive Power Device, Class B. Packing requirements:

A27.28.1. Wooden boxes or wooden boxes, fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B.

A27.28.2. Containers authorized by military specification or drawings.

A27.29. Rocket Engine (Liquid), Class B Explosives. Pack in strong, airtight metal containers approved by military specification or drawings. Follow handling instructions and special requirements in A5.74.

A27.30. Cartridge, Practice Ammunition. Pack in inside boxes, partitions, or metal clips to protect primers from accidental firing, then place in:

A27.30.1. A strong wooden box closed by strapping.

A27.30.2. A fiberboard box closed by strapping or taping.

A27.30.3. A metal container.

A27.31. Blasting Agent NOS. Packaging Requirements:

A27.31.1. Rigid packages (for example, boxes and drums), prepared as for shipment, must be capable of withstanding a 4-foot drop onto solid concrete so as to strike the most vulnerable point on the package without rupture of any loss of contents.

A27.31.2. Nonrigid packages (for example, tubes and bags), prepared as for shipment, must be capable of withstanding three 4-foot drops onto solid concrete without rupture of any loss of content.

A27.32. Oil Well Cartridges. Pack so that explosive composition is not over 20 grains per cubic inch of space in the following shipping containers:

A27.32.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. Gross weight must not exceed 150 pounds.

A27.32.2. Fiberboard box, DOT 15B. Gross weight must not exceed 65 pounds.

A27.33. Moderate Ammunition Explosive Hazards. Pack in strong fiberboard or wooden boxes. The ammunition may also be packed in wooden or metal barrels or drums.

Table A27.2. DOT/Military Specification Cross Reference.

DOT Specification	Military/Federal Specification	Description
1A	None	Boxed carboys
2C	PPP-B-636, Type CF-DW, 275	Inside containers, corrugated fiberboard carton
2F	PPP-C-96	Inside metal container and liner
2L	None	Lining for boxes
2S	MIL-D-40030, Styles A and B	Polyethylene containers
5	PPP-P-704, Type I, Class 7 and 10	Steel barrels or drums
5B	PPP-P-704, Type I, Class 4; Type III, Class 7 and 8; PPP-D-729, Type 1, Class A and B	Steel barrels or drums
6B	PPP-D-736, Type III and IV	Steel barrels or drums
6C	None	Steel barrels or drums
6D	PPP-C-1337, Type I, Class 3 and 4, Type II	Cylindrical steel overpack, straight sided for inside plastic container
12B	PPP-B-636, Type CF or SF, V3c	Fiberboard boxes
12H	PPP-B-636, Type CF, V3c, Style FTC	Fiberboard boxes
13	None	Metal kegs
13A	None	Metal drums
14	None	Wooden boxes, nailed
15A	PPP-B-621, Styles 1, 2, 2 ¾, 6, and 7, MIL-B-2427, Types I, II, III. MIL-B-48024, Type I and II.	Wooden boxes, nailed.
15B	PPP-B-621, Style 1, 2, 2 ¾, 6, and 7. MIL-B-2427, Type I, II, III. MIL-B-48024, Type I and II	Wooden boxes, nailed
15C	PPP-B-621, Style 1, 2, 2 ¾, 6, and 7. MIL-B-2427, Type I, II, III. MIL-B-48024, Type I and II.	Wooden boxes, nailed
15E	None	Wooden boxes, fiberboard lined

DOT Specification	Military/Federal Specification	Description
15L	None	Wooden boxes with inside containers for desensitized liquid explosives
15M	None	Wooden boxes, metal lined, with inside containers for desensitized liquid explosives
16A	PPP-B-585; MIL-B-46506	Plywood or wooden boxes, wirebound
17C	PPP-P-704, Type I, Class 4 and 9; Type II, Class 10 and 11. PPP-D-736, Type V and VI	Steel drums
17H	PPP-D-729, Type IV; PPP-D-705, Type V; PPP-P-704, Type II, Class 7	Steel barrels or drums
19A	PPP-B-601; MIL-B-48024	Wooden boxes, glued plywood, cleated
19B	None	Wooden boxes, glued plywood, nailed
21C	None	Fiber drum
23F	PPP-B-636, Type CF and SF	Fiberboard boxes
23G	None	Special cylindrical fiberboard box for high explosives.
23H	PPP-B-636, Type SF	Fiberboard boxes
37A	PPP-P-704, Type II, Class 1,3,5,8, and 9; Type III, Class 1,3, and 6; MIL-D-13901	Steel drums

Attachment 28

INSPECTION PROCEDURES

A28.1. Inspection General Requirements. Inspect hazardous materials before entering into the military airlift system. The inspection will ensure hazardous materials are properly prepared and documented. Follow the guidelines in this attachment when inspecting hazardous materials, including opening an external container to inspect the internal packagings.

A28.1.1. Originating Shipping Activities. This activity must prevent entry of improper shipments into the transportation system. Establish a quality control program that ensures packing, marking, labeling, and certifying of hazardous materials comply with this manual and safety of airlift criteria.

A28.1.1.1. Inspect each package to ensure the packaging is correct and in good condition.

A28.1.1.2. Open exterior containers if there is physical evidence to support suspected damage of the inner receptacles or if the external markings do not correspond to the type of container. Reseal opened containers according to the applicable test report or special packaging instruction (SPI).

A28.1.1.3. Provide graduated dip-stick with any vehicle or wheel engine-powered support equipment without an operational fuel gauge containing fuel-in-tank. Not required if the item is drained and purged or drained to 500 ml (17 oz) or less of residual fuel.

A28.1.1.4. Check shipper's certification for overall accuracy including correct packaging paragraph.

A28.1.1.5. Immediately remove damaged or improperly prepared packages from the transportation system.

A28.1.1.6. Periodically inspect cylinders or spheres to ensure they have been retested and marked as required by 49 CFR, Part 180, Subpart C and DLAR 4145.25/AR 700-68/NAVSUPINST 4440.128/MCO 10330.2B/ AFMAN 23-227(I), *Storage and Handling of Compressed Gases and Cylinders*. Do not offer for transportation any cylinder or sphere not meeting this requirement.

A28.1.2. Inspectors Other Than Originating Shipping Activity. Establish an inspection program at each Aerial Port of Embarkation to prevent improperly prepared hazardous material from entering the transportation system.

A28.1.2.1. As a minimum, visually inspect all exterior containers and equipment for damage or leakage. Reject packages showing evidence of leakage (moisture or staining) or other suspected damage until corrective action is taken to make sure the item is safe for air shipment (see paragraph **1.9.**).

A28.1.2.2. Remove improperly prepared or damaged containers from the transportation system and advise the shipper to immediately coordinate corrective action. Properly store suspect packages containing explosive material pending repair or disposition.

A28.1.2.3. Use accurate fuel gauges, graduated dip-sticks or other positive means to determine the amount of fuel-in-tank for vehicles and equipment. If positive means is not available, drain and refill fuel tank to appropriate level in the presence of an inspector.

A28.1.2.4. Review all Shipper's Declarations for Dangerous Goods for accuracy. Make sure special instructions and warning labels are complete and being followed.

A28.1.2.5. Enter "Inspected by (followed by name of inspector, location, and date)" in key 6 of the Shipper's Declaration form. The "Inspector" cannot be the same individual who completes the Shipper's Declaration for Dangerous Goods and signs Key 22.

A28.1.2.6. Do not violate compatibility requirements (**Attachment 18**) in the consolidation or makeup of cargo loads.

A28.1.2.7. Prepare SF 364, Report of Discrepancy, according to DLAI 4140.55/AR 735-11-2/ SECNAVINST 4355.18A/AFMAN 23-215 (or equivalent reporting means as designated by the Service Focal Points and coordinated with HQ AMC) for any deficiencies discovered.

A28.1.2.8. The Contingency Response Group (CRG), Departure Airfield Control Group (DACG), or Mission Support Element/Team (MSE/MST) or Cargo Deployment Function (CDF) provides qualified inspectors for the mobility movement inspection function during tactical or contingency deployments, redeployments, and exercises (see paragraph **1.2.6.**).

A28.1.2.9. **Figure A28.1.** is an example of inspection record format.

A28.2. Inspection Packaging Procedures. Design inspection procedures to validate safety of the shipment. Do not physically damage the package or perform any function that adversely affects the integrity or original performance capability of the packaging.

A28.2.1. Packaging Areas of Emphasis. As a minimum, inspection will address the following areas:

A28.2.1.1. Single Packaging.

A28.2.1.1.1. Drum ullage.

A28.2.1.1.2. External visual condition and serviceability. Dents or corrosion at chime or seam, or dents causing paint chipping is considered damaged and must be removed from the transportation system.

A28.2.1.1.3. External package marking and labeling. Verify UN specification code (including package type and gross weight), for air eligibility, hazard and handling markings/labels.

A28.2.1.2. Combination Packaging.

A28.2.1.2.1. Inner receptacle orientation.

A28.2.1.2.2. Inner receptacle ullage.

A28.2.1.2.3. Inner receptacle secondary closure.

A28.2.1.2.4. Absorbent cushioning material.

A28.2.1.2.5. Leak-proof liner (covering item or lining outer container).

A28.2.1.2.6. Air-eligible.

A28.2.1.2.7. External package markings including UN specification code, air-eligible, hazard and handling marking/labels, orientation markings for combination packagings and drums used as overpacks.

A28.2.1.3. Vehicles and Equipment.

A28.2.1.3.1. Fuel gauges operative or a graduated dip-stick available.

A28.2.1.3.2. Fuel in tank quantity, including verifying presence of additional fuel tanks.

A28.2.1.3.3. Fuel leaks.

A28.2.1.3.4. Battery terminal posts protected against short circuit.

A28.2.1.3.5. Fire extinguishers secured in properly configured and approved holders.

A28.2.1.3.6. Spare fuel and secondary loads properly identified, packaged, stowed, and restrained.

A28.2.2. Packaging Opening and Closing. The following instructions provide acceptable procedures for opening external containers to inspect the internal packaging configuration. Comply with these procedures to maintain the performance capability of the package and the original shipper's certification. Noncompliance with any of these procedures constitutes repacking and requires a new certification.

A28.2.2.1. Fiberboard box opening.

A28.2.2.1.1. Cut original tape along seam using a shallow blade knife. Do not tear tape.

A28.2.2.1.2. If adhesive sealed on inside box flaps or the flaps are stitched/stapled (not closed by tape) opening will damage packaging components.

A28.2.2.2. Fiberboard box closure.

A28.2.2.2.1. Apply new tape over the existing tape using same method as original.

A28.2.2.2.2. Use only ASTM D 5486, Type I, Class 2 (film backed, pressure-sensitive adhesive, weather resistant) tape to reclose package.

A28.2.2.2.3. Ends of sealing tape must extend over the original tape a minimum of one-inch adhering to the fiberboard on the ends of the package.

A28.2.2.2.4. Use three-inch wide tape or two strips of two-inch wide tape.

A28.2.2.2.5. Ensure surface is clean and dry before applying tape and box flaps meet squarely.

A28.2.2.2.6. Do not cover markings or labels with tape.

A28.2.2.2.7. When reclosed using these procedures a new shipper's certification is not required. Based on DOD testing the packaging is considered returned to original condition and is not considered repacking.

A28.2.2.2.8. If adhesive sealed on inside box flaps or flaps are stitched/stapled (not closed by tape) then reclosure is considered repacking and requires a new shipper's certification.

A28.2.2.3. Wood box opening.

A28.2.2.3.1. Opening causes damage to packaging material.

A28.2.2.3.2. To reduce damage to wood material, use a nail puller to remove nails.

A28.2.2.3.3. Do not pry open wood box panels using crowbars, etc.

A28.2.2.4. Wood box closure.

A28.2.2.4.1. Do not close by nailing through existing holes.

A28.2.2.4.2. Must replace damaged components. Use prescribed materials and specifications required by the applicable test report, special packaging inst ruction, or drawing.

A28.2.2.4.3. Replacing packaging material components is considered repacking and requires a new shipper's certification.

A28.2.2.5. Drum opening. Only open drums used as a combination package or overpack. Do not open drums used as a single package for liquid hazardous material.

A28.2.2.6. Drum closure.

A28.2.2.6.1. Replace old gaskets with new gaskets and seals. Old gaskets will "set" and will not reseal properly.

A28.2.2.6.2. Use the torque and closing instructions required by the applicable test report.

A28.2.2.6.3. Reclosure of drum is considered repacking and requires new shipper's certification.

A28.2.2.7. Overpacks.

A28.2.2.7.1. Outer packaging used as an "Overpack" (for ease of handling) may be opened for inspection of contents. Follow inspection guidance for specific opening and closing of inside shipping containers according to **A28.2.2.**

A28.2.2.7.2. Close overpacks in a similar manner as received. A new shipper's declaration is not required.

A28.2.2.8. Non-Specification (strong outside) Packaging.

A28.2.2.8.1. Non-specification packaging may be opened for inspection.

A28.2.2.8.2. Close non-specification packaging in a similar manner as received. A new shipper's declaration is not required.

A28.2.2.9. UN Specification Jerricans.

A28.2.2.9.1. Caps may be removed for inspection.

A28.2.2.9.2. Re-secure cap (hand-tight) ensuring there is no "cross-threading." A new shippers declaration is not required.

A28.2.2.10. Shrink Wrap Packages. Do not cut, tear, or remove stretch or shrink wrap to verify packaging. Reject shipments if stretch or shrink wrap is cut, torn, or damaged so that it would prevent packages containing liquid hazardous materials from tipping or becoming loose in flight, or for any package that would be a hazard during handling operations.

A28.2.3. Inner package inspection.

A28.2.3.1. Perform visual inspection. Do not rearrange inner packaging contents or configuration.

A28.2.3.2. Do not cut wraps or barrier material.

A28.2.3.3. Any change to the inner configuration is considered repacking and requires a new shipper's certification.

A28.2.4. Exceptions to inspection. Some item packaging requires specialized training for opening, interior inspection, and closure. Only individuals trained and qualified in these specialized areas are authorized to open the following packagings:

A28.2.4.1. Radioactive material

A28.2.4.2. Class 1 (ammunition and explosives)

A28.2.4.3. Etiological Agents or Infectious Substances

A28.2.4.4. Pressurized metal shipping containers or drums

A28.2.4.5. Material identified as "inhalation hazard"

A28.3. Inspection Checklist. Inspection activities will establish a program that standardizes the local inspection process and ensures continuous level of quality. **Figure A28.1.** provides a suggested checklist to use during the inspection process.

Figure A28.1. Hazmat Inspection Checklist(SAMPLE).

HAZMAT INSPECTION AND ACCEPTANCE CHECKLIST					TCN
INSPECTION VALIDATION					
THE SHIPMENT HAS BEEN INSPECTED AND		COMPLIES WITH ALL REGULATORY REQUIREMENTS		DOES NOT COMPLY WITH ALL REGULATORY REQUIREMENTS AS INDICATED	
DATE *(YYYYMMDD)*	INSPECTED BY *(NAME)*		DATE *(YYYYMMDD)*		CORRECTED BY *(NAME)*
DATE *(YYYYMMDD)*	RE-INSPECTED BY *(NAME)*		CORRECTIVE ACTIONS CHECKED. SHIPMENT COMPLIES WITH ALL REGULATORY REQUIREMENTS.		
ENTER "X" TO IDENTIFY NONCOMPLIANCE. USE COMMENTS BLOCK TO PROVIDE ADDITIONAL DETAILS. CIRCLE "X" WHEN CORRECTIVE ACTION IS COMPLETED. SIGN INSPECTION VALIDATION BLOCK AND ATTACH TO SHIPPER'S DECLARATION FIELD WITH STATION MANIFEST. THOSE ITEMS THAT APPLY ONLY TO RADIOACTIVE MATERIAL ARE IDENTIFIED BY AN "." ADDITIONAL CHECKPOINTS ON THE REVERSE.*					
SHIPPER"S DECLARATION			PACKAGING - OUTER		
	1. THREE ORIGINAL DOCUMENTS FOR EACH PROPER SHIPPING NAME (PSN) UNDER A SINGLE TCN			39. CONTAINER SERVICEABLE; DAMAGE, LEAKAGE, OR LOSS OF CONTENTS	
	2. SHIPPERS ADDRESS AND PHONE NUMBER			40. APPROVED OUTER CONTAINER *(IF REQUIRED)*	
	3. CONSIGNEE DODAAC OR ADDRESS *(OR WORLDWIDE MOBILITY)*			41. PACKAGING PERMITTED BY PACKAGING REFERENCE	
	4. TRANSPORTATION CONTROL NUMBER (TCN)			42. OTHER	
	5. AIRPORT OF DEPARTURE AND DESTINATION *(OR WORLDWIDE MOBILITY)*			IF APPLICABLE	
	6. NAME AND TITLE OF PREPARER WITH SIGNATURE			43. ULLAGE	
	7. PLACE AND DATE MATERIAL CERTIFIED			44. UN SPECIFICATION CONTAINER MATCHES CORRESPONDING PACKING GROUP	
	8. PEN AND INK CHANGES SIGNED			45. GROSS WEIGHT OF PACKAGE IS EQUAL TO OR LESS THAN TESTED WEIGHT INDICATED AS PART OF UN SPECIFICATION MARKING	
	9. EMERGENCY RESPONSE NUMBER			46. SINGLE PACKAGE (CONTAINING A LIQUID) TESTED PRESSURE (KPA) AGREES WITH CONTAINER REQUIREMENTS	
	10. OTHER			47. OTHER	
CARGO IDENTIFICATION *(NATURE & QUANTITY OF HAZMAT)*			PACKAGING –INNER *(IF INSPECTED AND APPLICABLE)*		
	11. IDENTIFIES WHETHER PACKED WITHIN PASSENGER OR CARGO AIRCRAFT ONLY LIMITATIONS			48. ABSORBENT MATERIAL	
	12. IDENTIFIES RADIOACTIVE OR NONRADIOACTIVE SHIPMENT			49. LEAK OR ACID PROOF LINER	
	13. PSN *(WITH TECHNICAL NAME IF IDENTIFIED BY "*")*			50. INNER RECEPTACLE ORIENTATION	
	14. PRIMARY HAZARD CLASS OR DIVISION *(COMPATIBILITY GROUP FOR EXPLOSIVES)*			51. SECONDARY CLOSURE	
	15. IDENTIFICATION NUMBER *(UN, ID, OR NA)*			52. OTHER	
	16. PACKAGING GROUP (PG) IF APPLICABLE			MARKING	
	17. SUBSIDIERY RISK CLASS OR DIVISION, IF ASSIGNED			53. PSN AND UN, ID, OR NA NUMBER *(FOR MULTIPLE ITEMS IN OVERPACK, EACH HAZARD IS IDENTIFIED)*	
	18. NUMBER AND TYPE OF PACKAGES			IF APPLICABLE	
	19. NET QUANTITY PER PACKAGE *(METRIC UNLESS EXCEPTED)*			54. UN SPECIFICATION MARKING	
	20. R-ACTIVITY PER PACKAGE GIVEN IN BECQUEREL SYSTEM			55. "RQ"	
	21. R-NAME AND SYMBOL OF MATERIAL			56. "WASTE"	
	22. R-MATERIAL PHYSICAL AND CHEMICAL FORM			57. "INHALATION HAZARD" *(NOT REQUIRED IF PART OF LABEL)*	
	23. PACKAGING PARAGRAPH *(FROM Attachment 5-Attachment 13)*			58. AIR ELIGIBLE MARKING FOR LIQUIDS	
	24. A3.2.3 USED WHEN UN SPECIFICATION TESTED PACKAGE IS OVERPACKED TO MEET AIR REQUIREMENTS			59. "INNER (INSIDE) PACKAGE (CONTAINER) COMPLIES WITH PRESCRIBED SPECIFICATIONS" USED WHEN SHIPPER'S DECLARATION STATES "OVERPACK USED" OR WHEN OTHERWISE REQUIRED	
	25. DOT-SP, COE, CAA, OR OTHER APPROVED DOCUMENT USED AS CERTIFICATION REFERENCE *(COPY ACCOMPANIES SHIPMENT)*			60. "ORIENTATION" ARROWS ON COMBINATION PACKAGES CONTAINING LIQUIDS OR PACKAGES CONTAINING WET CELL BATTERIES	
	26. 49 CFR, IATA, OR ICAO REFERENCE USED AS CERTIFICATION REFERENCE *(IF MEETING PASSENGER RESTRICTIONS)*			61. "LIMITED QUANTITY" OR "LTD QTY"	
				62. FLASHPOINT *(FOR FLAMMABLE LIQUIDS)*	
	27. R-CATEGORY OF RADIOACTIVE PACKAGE			63. "ORM-D" OR "ORM-D AIR" FOR DOMESTIC ONLY SHIPMENT OF PSN "CONSUMER COMMODITY" *(NOT IDENTIFIED AS A CLASS 9)*	
	28. R-TRANSPORT INDEX			64. DOT-SP NUMBER *(WHEN USED AS CERTIFICATION REFERENCE)*	
IF APPLICABLE				65. COE NUMBER *(WHEN USED AS CERTIFICATION REFERENCE)*	
	29. "RQ" IDENTIFIES A PSN AS A HAZARDOUS SUBSTANCE			66. CAA NUMBER *(IF REQUIRED BY CAA)*	
	30. "WASTE" IS MARKED OR LABELED ON PACKAGE			67. OTHER	
	31. "TOXIC" IF NOT INCLUDED AS PART OF DIVISION 6.1 (PG I OR PG II) PSN			LABELING	
	32. "INHALATION HAZARD (ZONE)" IF MATERIAL MEETS THIS DEFINITION			68. PRIMARY RISK LABEL	
	33. "OVERPACK USED" IF OVERPACKED			69. R-RADIOACTIVE MATERIAL LABELS ON OPPOSITE SIDES OF	
	34. "LIMITED QUANTITY" OR "LTD QTY"			IF APPLICABLE	
				70. SUBSIDIARY RISK LABELS	
	35. CRYOGENICS VENTING REQUIREMENTS			71. "CARGO AIRCRAFT ONLY" *(IF SO IDENTIFIED ON THE SHIPPER'S DECLARATION, NOT MANDATORY FOR Chapter 3)*	
	36. SECONDARY HAZARD PSN, CLASS, CLASS OR DIVISION AND NET QUANTITY			72. "MAGNETIZED MATERIAL" *(IF ITEM MEETS DEFINITION)*	
	37. HANDLING INSTRUCTIONS			73. "EMPTY" *(IF ITEM MEETS DEFINITION)*	
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	75. FUEL GUAGE OPERATIVE OR DIP STICK AVAILABLE				
	76. VEHICLES AND SELF-PROPELLED EQUIPMENT WITH FUEL QTY NOT EXCEEDING ½ TANK CAPACITY *(DRAINED IF PALLETIZED UNLESS MEETING SUBFLOOR REQUIREMENTS)*				
	77. SUPPORT EQUIPMENT DRAINED				
	78. NO EXISTING FUEL LEAKS				
	79. ALL ADDITIONAL HAZARDS IDENTIFIED *(SEE BLOCK 37)*				
	80. SECONDARY LOADS CERTIFIED, PACKAGED, AND MARKED				
	81. BULK FLAMMABLE LIQUID FUEL TANKS DRAINED OR PURGED AS REQUIRED				
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By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
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