UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: TOP-3-2-831

2. GOVT ACCESSION NO.

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle): U. S. ARMY TEST AND EVALUATION COMMAND TEST OPERATIONS PROCEDURE CLEANING AND PRESERVING OF WEAPONS

5. TYPE OF REPORT & PERIOD COVERED: Final rept.

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)

8. CONTRACT OR GRANT NUMBER(s)

9. PERFORMING ORGANIZATION NAME AND ADDRESS
U. S. ARMY ABERDEEN PROVING GROUND (STEAP-MT-M)
ABERDEEN PROVING GROUND, MARYLAND 21005

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
DARCOM-R 310-6

11. CONTROLLING OFFICE NAME AND ADDRESS
U. S. ARMY TEST AND EVALUATION COMMAND (DRSTE-ME)
ABERDEEN PROVING GROUND, MARYLAND 21005

12. REPORT DATE: 15 Sep 1977

13. NUMBER OF PAGES: 9 (12 pp.)

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)

15. SECURITY CLASS. (of this report): Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

DDC RECEIVED OCT 31 1977 F

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Artillery	Machine Guns	Small Arms
Automatic Weapons	Mortars	Weapon, Towed
Cannon	Preserving, Weapon	Weapon, Vehicle Mounted
Cleaning, Weapon	Recoilless Rifles	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Provides procedures for cleaning weapons after firing and for preserving weapons for storage and shipping. Lists specifications for materials used in processing. Applies to artillery cannon (including mortars), recoilless rifles, and small arms.

041754

AD A045766

DDC FILE COPY

US ARMY TEST AND EVALUATION COMMAND
TEST OPERATIONS PROCEDURE

DRSTE-RP-702-102
Test Operations Procedure 3-2-831 15 September 1977
AD No.

CLEANING AND PRESERVING OF WEAPONS

			Page
Paragraph	1.	SCOPE	1
	2.	FACILITIES	2
	3.	CONTROLS	3
	4.	ARTILLERY CANNON (INCLUDING MORTARS) AND RECOILLESS RIFLES	3
	4.1	Cleaning/Drying	3
	4.1.1	Artillery Tubes, Calibers 37-mm to 152-mm and 165-mm	4
	4.1.2	Artillery Tubes, Calibers 155-mm, 175-mm, and 8-Inch	4
	4.1.3	Mortars, 4.2-Inch (Rifled)	4
	4.1.4	Mortars, 60-mm and 81-mm	5
	4.1.5	Recoilless Rifles	5
	4.1.6	Chamber Bore Evacuators, Muzzle Brakes, Breech Rings, Breechblocks, and Associated Artillery Parts	5
	4.2	Preservation	5
	4.2.1	Outside Storage for All Major Caliber Tubes Except 175-mm and 8-Inch	5
	4.2.2	Outside Storage of 175-mm and 8-Inch Tubes	6
	4.2.3	Inside Storage of Tubes	6
	4.2.4	Packaging and Shipping	6
	5.	SMALL ARMS	7
	5.1	Cleaning/Drying	7
	5.2	Preservation	7

1. SCOPE. This TOP provides procedures for cleaning weapons after firing and for preserving weapons for storage and shipping. It applies to artillery cannon (including mortars), recoilless rifles, and small arms.

ACCESSION for
NTIS White Section
DDC Buff Section
UNANNOUNCED
JUSTIFICATION
BY
DISTRIBUTION/AVAILABILITY CODES
Dist. SPECIAL
A

for public release; distribution unlimited.

2. FACILITIES.

ITEM	REQUIREMENTS
Bore brush	As applicable to the weapon
Clean, dry, lint-free cloth or specially prepared wiping papers	MIL-P-116G, para 6.7: 1/ "Linen, combed cotton and General Services Administration Stores Stock Catalog listed lint free nonwoven fabric cleaning cloths may be considered lint free for drying and inspection use."
Bore cleaner for cannon and recoilless rifles	NSN-6850-00-224-6663
Bore cleaner for small arms	Specified in MIL-C-372B 2/
Scouring powder (cannon and recoilless rifles)	Type I, class 2, P-S-311 3/
Steel wire wheel driven by electric motor (not applicable to chromium plated tubes)	See paras 4.1.1b, 4.1.2b
Steel wool hone driven by electric motor	See paras 4.1.4a, 4.1.5b
Corrosion inhibitor	See para 4.1.2
Steam cleaner (paras 4.1.5c, 4.1.6a)	Soap solution NSN-6850-00-256-0157
Solvents	See paras 4.1.5, 4.1.6, 5.1)
Crocus cloth	NSN-5350-00-221-0872
Corrosion preventive compounds	See paras 4.2.1, 4.2.2d
VCI paper (para 4.2.2)	MIL-P-3420D 4/

1/ MIL-P-116G, Preservation-Packaging, Methods of.
2/ MIL-C-372B, Cleaning Compound, Solvent - for Bore of Small Arms and Automatic Aircraft Weapons.
3/ Fed Specification P-S-311E, Scouring Powder.
4/ MIL-P-3420D, Packaging Materials, Volatile Corrosion Inhibitor, Treated, Opaque.

ITEM (Cont)	REQUIREMENTS (Cont)
Lubricants	VV-L-800 5/ (paras 4.2.2, 4.2.3) MIL-L-3150B 6/ (paras 4.2.3, 5.2.2) MIL-L-46000B 7/ (para 5.2.1) MIL-L-14107C 8/ (para 5.2.1)
Coating compound (para 4.2.2)	MIL-C-16555D, type I, class I or type II, class I 9/
OD tape (para 4.2.2)	PPP-T-60D 10/
Barrier material (para 4.2.2)	MIL-B-121D, type I, grade A, class II 11/
Polyfilm (para 4.2.2)	L-P-378, type IV, class B 12/

3. CONTROLS. All surfaces exposed to burnt powder during test firing will be cleaned as soon as possible after firing and preferably while the tube is still warm. If the cleaning cannot be accomplished within 8 hours after firing, it is imperative that the areas exposed to burnt powder be treated with bore cleaner until they can be cleaned. The burnt powder and bore cleaner must then be removed and the powder-exposed areas thoroughly cleaned within 80 hours.

4. ARTILLERY CANNON (INCLUDING MORTARS) AND RECOILLESS RIFLES.

4.1 Cleaning/Drying.

a. Bore Cleaning Cycles. A cleaning cycle consists of one complete forward and backward stroke of a bore brush (fastened around a cleaning staff) through the entire bore. Push or pull the brush entirely through the bore on each stroke. Repeat cleaning cycles until all traces of firing contaminants are removed in the inspector's judgment. After this cleaning is completed, process all surfaces of the weapon in accordance with b and c below.

b. Surface Cleaning. All surfaces (inside and outside) "...shall be cleaned by any process or combination of processes which will accomplish thorough cleaning without damage to the item(s)." (MIL-P-116G, para 3.3.1).

5/ Fed Specification VV-L-800A, Lubricating Oil, General Purpose, Preservative (Water-Displacing, Low Temperature).
6/ MIL-L-3150B, Lubricating Oil, Preservative, Medium.
7/ MIL-L-46000B, Lubricant, Semi-fluid (Automatic Weapons).
8/ MIL-L-14107C, Lubricating Oil, Weapons, Low Temperature.
9/ MIL-C-16555D, Coating Compound, Strippable, Sprayable.
10/ Fed Specification PPP-T-60D, Tape: Packaging, Waterproof.
11/ MIL-B-121D, Barrier Material, Creaseproofed, Waterproofed, Flexible.
12/ Fed Specification L-P-378D, Plastic Sheet and Strip, Thin Gauge, Polyolefin.

c. Drying. "Drying shall be effected by wiping the surfaces of the item(s) with clean, dry, lint free cloths or specially prepared wiping papers." (MIL-P-116G, para 3.4.4) (See para 2 for definition of lint-free cloths.) To dry the tubes, push completely through the bore bales of waste wrapped in lint-free cloth.

4.1.1 Artillery Tubes, Calibers 57-mm to 152-mm and 165-mm.

a. Apply the specified bore cleaner and scouring powder (para 2) around the bore brush; then complete the cleaning cycles as described in 4.1a above until all traces of firing contaminants are removed.

b. Clean the chamber by applying the bore cleaner and scouring powder around a steel wire wheel driven by an electric motor. Insert the wheel into the chamber and drive it back and forth until all traces of firing contaminants are removed.

CAUTION: Do not use a steel wire wheel on chromium plated tubes. In this case, use only a bore brush.

c. Proceed in accordance with 4.1 b and c above.

4.1.2 Artillery Tubes, Calibers 155-mm, 175-mm, and 8-Inch.

a. Apply the specified scouring powder (para 2) around the bore brush; then add about a pint of hot water (with Pangborn corrosion inhibitor or equivalent) just ahead of the bore brush at the start of the cleaning cycle. Complete the cleaning cycles as described in 4.1a above until all traces of firing contaminants are removed.

b. Clean the chamber by applying the scouring powder around a steel wire wheel driven by an electric motor (see caution above) followed by adding about a pint of hot water (with Pangborn corrosion inhibitor or equivalent) just ahead of the steel wheel. Insert the wheel into the chamber and drive it back and forth until all traces of firing contaminants are removed.

c. Proceed in accordance with 4.1 b and c above.

4.1.3 Mortars, 4.2-Inch (Rifled).

a. Apply the specified bore cleaner around the bore brush and a pad of steel wool placed at the end of the cleaning staff following the bore brush; then complete the cleaning cycles (4.1a above) with the addition of twisting the cleaning staff back and forth at the end of each forward stroke to clean the basecap.

b. Proceed in accordance with 4.1 b and c above.

4.1.4 Mortars, 60-mm and 81-mm.

a. Apply the specified bore cleaner to a steel wool hone driven by an electric motor, and drive it back and forth through the bore until all traces of firing contaminants are removed.

b. Proceed in accordance with 4.1 b and c above.

4.1.5 Recoilless Rifles.

a. Apply the specified bore cleaner and a small amount of the scouring powder around the bore brush; then complete the cleaning cycles as described in 4.1a above until all traces of firing contaminants are removed.

b. Clean the chamber by applying the bore cleaner and a small amount of the scouring powder to a steel wool hone driven by an electric motor, and driving the hone back and forth through the chamber until all traces of firing contaminants are removed.

c. Steam clean the block and vent of the recoilless rifle by using a steam cleaner filled with the specified soap solution (para 2). Another method of cleaning the block and vent is to apply dry cleaning solvent, type I, amend II, NSN 6850-00-264-9039 followed by steel wool and the scouring powder until all traces of firing contaminants are removed.

d. Proceed in accordance with 4.1 b and c above.

4.1.6 Chamber Bore Evacuators, Muzzle Brakes, Breech Rings, Breechblocks, and Associated Artillery Parts.

a. Steam clean the above parts by using a steam cleaner filled with the specified soap solution (para 2).

b. After the breech ring spindle has been steam cleaned, clean the primer hole with a small caliber brush dipped in solvent (same as specified in 4.1.5c above).

c. Hand clean the split rings with the solvent and specified crocus cloth (para 2).

CAUTION: Wipe obturator pads with a soft cloth containing a soap solution followed by wiping with a clean cloth.

4.2 Preservation. After cleaning, prepare weapons for storage and shipping as follows:

4.2.1 Outside Storage for All Major Caliber Tubes Except 175-mm and 8-Inch. Coat the bore and chamber surfaces with corrosion preventive compound,

petrolatum, hot application, hard film, class I, MIL-C-11796B. 13/ Repaint painted areas. Coat unpainted outside surfaces with corrosion preventive compound, cold application solvent cutback, hard film, MIL-C-16173D. 14/

4.2.2 Outside Storage of 175-mm and 8-Inch Tubes.

a. Coat the bore and chamber surfaces with preservative oil VV-L-800, then insert volatile corrosion inhibitor (VCI) paper the length of the bore with the chemically coated side of the paper adjacent to the bore surface. After this, seal both ends with wooden discs coated with coating compound MIL-C-16555D, type I, class I or type II, class I. Hold the discs in place with PPP-T-60 (OD) tape.

b. On the breech end and over the outside threaded portion, coat with thin film preservative MIL-C-16173D, grade 2; then wrap with barrier material MIL-B-121D, type I grade A, class II.

c. Cover the muzzle end by stretching polyfilm L-P-378, type IV, class B over it. Secure with PPP-T-60 (OD) tape so that it completely covers the film. Seal with coating compound MIL-C-16555D (same type as in a above).

d. Cover recoil slide rails with corrosion preventive compound, cold application solvent cutback, hard film, MIL-C-16173D.

4.2.3 Inside Storage of Tubes.

a. To preserve tubes to be stored in areas where they can be checked frequently (once a month), coat all unpainted areas, including the bore and chamber, with light preservative oil VV-L-800.

b. To preserve tubes to be stored in areas where they will be checked infrequently (every 6 months), coat all unpainted parts with medium preservative oil MIL-L-3150B and seal adequately.

4.2.4 Packaging and Shipping.

a. When tubes are packaged to be shipped or stored indefinitely (final packaging), follow the level A procedure described in the packaging data sheet that accompanies the packaging order.

b. For tubes that are shipped and used within 60 days (mostly domestic shipments) follow level B of the applicable packaging data sheet or user packaging instructions.

13/ MIL-C-11796B, Corrosion Preventive Compound, Petrolatum, Hot Application.
14/ MIL-C-16173D, Corrosion Preventive Compound, Solvent Cutback, Cold Application.

5. SMALL ARMS.

5.1 Cleaning/Drying. If cleaning cannot be accomplished within 8 hours of firing (para 3), treat the bore with MIL-C-372B bore cleaner to protect the bore from corrosion and prevent carbon deposits from hardening. Before 30 hours have elapsed, remove the burnt powder and bore cleaner and clean the weapon as follows:

a. Completely disassemble the weapon; then, using a steel brush, manually remove loose particles from parts showing heavy carbon deposits.

b. Immerse metallic, nonelectrical components in trichloroethane solvent, NSN 6810-00-551-1487, then brush by hand to remove all carbon deposits. Allow these parts to air-dry.

c. Immerse nonmetallic and electrical components in dry cleaning solvent, type I, amend II, NSN 6850-00-264-9039, then brush to remove all carbon deposits. Dry these parts using a cloth (para 2) or compressed air.

d. Clean the bore of the weapon using a trichloroethane-solvent-saturated steel brush attached to a cleaning rod. Insert the brush into one end of the bore and push it completely through the barrel and out the other end, then pull the brush back completely through the barrel. Repeat this cycle until all traces of carbon have been removed. Additional solvent may be added to the brush as necessary.

e. Dry the bore using cloth patches attached to a cleaning rod. Push and pull the patches completely through the bore until all solvent has been absorbed.

5.2 Preservation.

5.2.1 Lubrication Before Use.

a. Temperate and high-temperature environments: Lubricate with medium weapon oil conforming to MIL-L-46000B and reassemble.

b. Low-temperature environments: Lubricate with arctic weapons oil conforming to MIL-L-14107C and reassemble.

5.2.2 Lubrication for Storage or Shipment. If weapons are to be placed in storage or shipped to another location, lubricate them internally and externally with general purpose lubrication oil conforming to MIL-L-3150B. If the weapons are to be stored for periods longer than 1 year, relubricate on a yearly basis.

Recommended changes to this publication should be forwarded to Commander, U. S. Army Test and Evaluation Command, ATTN: DRSTE-ME, Aberdeen Proving Ground, Md. 21005. Technical information may be obtained from the preparing activity: Commander, U. S. Army Aberdeen Proving Ground, ATTN: STEAP-MT-M, Aberdeen Proving Ground, Md. 21005. Additional copies are available from the Defense Documentation Center, Cameron Station, Alexandria, Va. 22314. This document is identified by the accession number (AD No.) printed on the first page.