

MIL-L-0063460C  
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## MILITARY SPECIFICATION

### LUBRICANT, CLEANER AND PRESERVATIVE FOR WEAPONS AND WEAPON SYSTEMS

This limited coordination military specification has been prepared by the US Army Armament Research and Development Command based upon currently available technical information but it has not been approved for promulgation as a coordinated revision of MIL-L-63460. It is subject to modification. However, pending its promulgation as a coordinated military specification, it may be used in acquisition.

#### 1. SCOPE

1.1 Scope. This specification covers one type of compound for use in cleaning, lubricating and preservation of weapons, both small and large caliber, operating within the temperature range of -53.9° to +65.5°C (-65° to 150°F), (see 6.1). The lubricant is identified by Military Symbol CLP.

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

#### SPECIFICATIONS

##### Federal

O-E-751	-Ether, Petroleum, Technical-grade
O-E-760	-Ethyl Alcohol (Ethanol), Denatured Alcohol and Proprietary Solvent
O-M-232	-Methanol (Methyl Alcohol)
P-D-680	-Dry Cleaning Solvent
QQ-A-250/4	-Aluminum Alloy 2024, Plate and Sheet
QQ-A-671	-Anode, Cadmium
QQ-B-626	-Brass, Leaded and Nonleaded, Rod, Shaped, Forgings and Flat Products with Finished Edges (Bar and Strip)
QQ-C-576	-Copper, Flat Products with Slit, Slit and Edge-rolled Sheared Sawed or Machined Edges (Plate, Bar, Sheet and Strip)
QQ-M-44	-Magnesium Alloy Plate and Sheet (AZ31B)
TT-N-95	-Naphtha, Aliphatic

Beneficial comments (recommendations, additions, deletions), and any pertinent data which may be of use in improving this document, should be addressed to: Commander, US Army Armament Research and Development Command, ATTN: DRDAR-TST-S, Dover, New Jersey 07801, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426), appearing at the end of this document, or by letter.

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## SPECIFICATIONS (Continued)

Military

MIL-A-18001 -Anode, Corrosion Preventive, Zinc, Slab Disc and Rod Shaped

## STANDARDS

Federal

FED-STD-791 -Lubricants, Liquid Fuels, and Related Products; Methods of Testing

Military

MIL-STD-105 -Sampling Procedures and Tables for Inspection by Attributes  
 MIL-STD-290 -Packaging, Packing and Marking of Petroleum and Related Products

(Copies of specifications, standards, drawings, and publications required by contractor in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.1.2 Other Government publications. The following other Government publications form a part of this specification to the extent specified herein.

PUBLICATIONS

## MATERIEL TEST PROCEDURES

\* 3-2-045 -Machine Guns and Automatic Weapons

(Copies of publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

Standards

\* ASTM A109 -Steel, Carbon, Cold-Rolled Strip  
 ASTM D56 -Flash Point by Tag Closed Tester  
 ASTM D92 -Flash and Fire Points by Cleveland Open Cup  
 ASTM D97 -Pour Point  
 ASTM D270 -Sampling Petroleum and Petroleum Products  
 ASTM D445 -Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity), Test for  
 ASTM D2266 -Test for Wear Preventive Characteristics of Lubricating Grease (Four-Ball Method)  
 ASTM D2670 -Measuring Wear Properties of Fluid Lubricants (Falex Method)

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(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.)

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the reference cited herein, the text of this specification shall take precedence.

### 3. REQUIREMENTS

3.1 Qualification. Compounds furnished under this specification shall be products which are qualified for listing on the applicable qualified products list at the time set for opening of bids (see 4.5 and 6.3).

- \* 3.1.1 Requalification. Any change in the formulation of a qualified product will necessitate its requalification. The compound supplied under contract shall be identical, within manufacturing tolerances, to the approved qualification sample. The Qualifying activity may, at its discretion, request complete requalification testing or require only partial requalification in order to determine the significance, impact and acceptability of any proposed formulation change, manufacturing process or change in plant location.

3.2 Material. The ingredients of the compound shall be of a grade and quality which have shown to be suitable for the intended purpose and which will produce a lubricating, cleaning and preserving compound conforming to the requirements of this specification. The compound shall contain no graphite or powdered metals.

3.2.1 Propellant. The propellant used in the aerosol can shall be carbon dioxide. The propellant shall be capable of propelling all the compound in the can.

3.3 Physical and chemical requirements. The compound shall conform to the respective requirements specified in Table I and in 3.4 through 3.13.

TABLE I. Requirements

Properties	Values
Flash point, min. °C (°F)	65.5 (150)
Pour point, max °C (°F)	-59.4 (-75)
Viscosity, kinematic, centistokes	
at 37.8°C (100°F), min	10.0
at -53.8°C (-65°F) max	3700.
Wear preventive characteristics, avg.,	
scar diameter mm, max	0.8
Falex wear life, minutes, (250 pound jaw load), min	20
* Falex load carrying capacity, jaw load pounds, min	750

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\* 3.4 Firing residue removal. Upon completing three replicates, the compound shall remove a minimum average of 80% of the residue remaining after the ignition of WC 844 propellant (see 6.7) as used in 5.56 mm cartridges (see 4.8).

3.5 Corrosion. The compound shall not produce visual evidence of pitting, etching, dark discoloration, or a weight change in excess of the following (see 4.9):

<u>Metal</u>	<u>Milligrams per square centimeter</u>
Zinc	1.5
Aluminum	0.2
Brass	1.0
Steel	0.2
Copper	1.5
Magnesium	0.5
Cadmium	1.5

3.6 Corrosion-protection.

3.6.1 Humidity cabinet. After a minimum of 900 hours exposure in a humidity cabinet, not more than three corrosion dots none of which exceeds one millimeter in length, width, or diameter, shall be evident on the test panels. The total of such corrosion dots on all three test panels shall not exceed three. Corrosion on the outer 1/4 inch (6mm) of the panels shall not be cause for rejection (see 4.10).

3.6.2 Salt-spray resistance. After a minimum of 100 hours exposure to a spray of 5-percent salt solution, not more than three corrosion dots, none which exceeds one millimeter in length, width, or diameter, shall be evident on any of the test panels. The total of such corrosion dots on all three test panels shall not exceed nine. Corrosion on the outer 1/4 inch (6mm) of the panels shall not be cause for rejection (see 4.11).

3.7 Water displacement and water stability. The compound, after storage in contact with water, shall satisfactorily displace water as evidenced by the absence of rust, mottling, or other abnormal surface stains on the test panels (see 4.12).

3.8 Residue and fluidity at low temperatures. The residue remaining after evaporation at 54.4°C (130°F) shall not be tacky and shall permit movement at -53.8°C (-65°F) when tested as specified in 4.13.

3.9 Interference with chemical agent detector paper. The compound shall cause no color formation on the chemical agent detector paper specified in 6.5 when tested as specified in 4.14.

3.10 Toxicity. The material shall have no adverse effect on the health of personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the contracting activity to the appropriate departmental medical service who will act as an advisor to the contracting agency (see 6.1). The supplier shall furnish the qualifying activity (see 6.3) with all the information necessary to evaluate the safety of the product (see 4.15).

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3.11 Gun performance. Stoppage of the gun attributable to the lubricant, or a reduction in the rate of fire of more than 15% per minute under the original rate, shall constitute performance failure (see 4.16).

3.12 Leakage (from gas-pressurized cans only). When tested as specified in 4.17, gas-pressurized cans shall not leak or become distorted.

3.13 Workmanship. The compound shall be uniform in color and appearance when examined, after shaking, by reflected light.

#### 4. QUALITY ASSURANCE PROVISION

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

#### 4.2 Lot.

4.2.1 Bulk lot. An indefinite quantity of a homogeneous mixture of compound offered for acceptance in a single, isolated container, or manufactured in a single plant run (not exceeding 24 hours), through the same processing equipment, with no change in the ingredient materials.

4.2.2 Packaged lot. An indefinite number of unit containers of identical size and type, offered for acceptance, and filled with a homogeneous mixture of compound manufactured in a single plant run (not exceeding 24 hours), through the same processing equipment, with no change in the ingredient materials.

#### 4.3 Sampling.

4.3.1 Sampling for examination of filled containers. Take a random sample of filled containers from each lot in accordance with MIL-STD-105 at inspection level II and acceptable quality level (AQL) - 2.5 percent defective.

4.3.2 Sampling for tests. Take samples for tests in accordance with ASTM D 270.

#### 4.4 Inspection.

4.4.1 Inspection of material. Perform inspection of material in accordance with method 9601 of Federal Test Method Standard No. 791.

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4.4.2 Examination of filled containers. Examine samples taken in accordance with 4.3.1 for compliance with MIL-STD-290 with regard to fill, closure, sealing, leakage, packaging, packing and marking requirements. Reject any container having one or more defects or under the required fill. If the number of defective or underfilled containers exceeds the acceptance number for the appropriate sampling plan of MIL-STD-105, reject the lot represented by the sample.

#### 4.5 Classification of tests.

- a. Qualification tests
- b. Quality conformance tests

4.5.1 Qualification tests. Qualification tests consist of tests for all of the requirements specified in section 3.

\* 4.5.1.1 Qualification samples. The qualification sample shall consist of four 1-gallon containers of the finished product. The sample will be accompanied by data responsive to 4.15. Separate Qualification and, therefore, sample shall be required for each base stock used. Sample and report shall be furnished to the address indicated in 6.3.

\* 4.5.1.2 Retention of qualification. In order to retain qualification of a product approved for listing on the Qualified Products List (QPL), the manufacturer shall be responsive to 4.5.2 and certify in writing, upon the request of the Qualifying activity, certification of product compliance to the requirements contained in this specification. Such certification shall be requested by the Qualifying activity at two year intervals effective from the date of original qualification. The Qualifying activity reserves the rights to re-test any qualified product whenever it is deemed in the best interest of the Government to do so.

\* 4.5.2 Periodic qualification re-evaluation. A re-evaluation of product shall be performed by the Qualifying activity on a one gallon sample of product drawn from the first lot, and each production lot thereafter, of lubricant processed under current contract or purchase order. Periodic re-evaluation samples shall be forwarded to the activity responsible for Qualification (see 6.3). Samples shall be plainly identified by labels or tags marked with the following information:

- Sample for periodic evaluation
- Lubricant, cleaner and preservative for weapons and weapons systems
- MIL-L-0063460C
- Name of manufacturer
- Product code number
- Date of manufacture
- Contract or order number
- Lot number

\* 4.5.2.1 Periodic qualification re-evaluation tests. The re-evaluation of products being manufactured under current contract shall consist of what tests the Qualifying activity determines necessary for product identity, verification and evaluation. Delivery of lubricant per current contract shall not be delayed pending completion of this test and inspection. The results obtained shall be considered indicative of product quality and production consistency. Failure of a lubricant sample to pass a periodic qualification re-evaluation shall

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require the acceptance and further shipment of lubricant to be discontinued until the manufacturer has corrected the conditions which led to the failure and has furnished data, documentation or affidavit to that effect. Further product failure or non-conformance shall constitute a basis for lot rejection and subsequent removal from the Qualified Product List.

- \* 4.5.3 Quality conformance tests. Quality conformance tests consist of tests for all the requirements in section 3 except for Gun performance test (3.11) and corrosion protection, humidity cabinet (3.6.1).

4.6 Test methods. Perform in accordance with the applicable methods listed in Table II and in paragraphs 4.7 through 4.18.

TABLE II. Test methods

Test	Method No. ASTM
Flash point	D56 <u>1/</u>
Pour point	D97
Viscosity, kinematic	D445 <u>2/</u>
Wear preventive characteristics	D2266 <u>3/</u>
Falex wear life	D2670 <u>4/</u>
<p><u>1/</u> If the flash point is over 175°F (79.4°C), use the Cleveland Open Cup method, D92.</p> <p><u>2/</u> Use this method with the following exception: Filter the compound through a 5 micron membrane filter with pressure prior to conducting the viscosity test.</p> <p><u>3/</u> Use this method with the following exceptions:</p> <p>a. Use a sample of 10 ± 0.5 milliliters.</p> <p>b. Make 6 duplicate runs and report average of results.</p> <p><u>4/</u> Use this method with the following exceptions:</p> <p>a. Use a 250 pound test load instead of the prescribed 1000 pound test load.</p> <p>b. Do not fill the lubricant cup with the test compound. Instead, apply a thin film to the V-area of the blocks and only to the mating surface of the test pin. Compound on the test pin above the V-blocks acts as a reservoir and gives false results. The excess fluid from the bottom of the test pin and blocks is removed by blotting with tissue.</p> <p>c. After actuating the motor engage the ratchet wheel and increase the load to 250 pounds. Disengage the loading ratchet, start the timer, and run at 250 pounds for the duration of the test.</p> <p>* d. Perform test on three replicate samples.</p>	



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- \* 4.7 Falex load carrying capacity. Use the Falex Lubricant Tester to determine the load carrying capacity of the compound. Use standard Falex jaw blocks made from SAE 1137 steel and standard Falex pins of SAE 3135 steel. Thoroughly clean the blocks and pins in warm petroleum naphtha conforming to TT-N-95, then methanol conforming to O-M-232, Grade A, then air dry them in a dessicator. Insert the blocks in the jaws of the tester and place the pin in the chuck. Install the shear pin to hold the test pin in place. Apply a thin film of the test compound to the V-area of the blocks and to the mating surface only of the test pin. Compound on the test pin above the V-blocks acts as a reservoir and gives false results. The excess fluid from the bottom of the test pin and blocks is removed by blotting with tissue. Close the jaws, install the loading device and gauge and start the tester. Increase the jaw load from zero to 250 pounds by means of the eccentric arm and ratchet wheel. Disengage the eccentric arm, start the timer and allow the machine to run at this loading for a 3 minute break in period. Re-engage the eccentric arm, start the timer and allow the machine to run at this load for 1 minute. Repeat this loading sequence in increments of 250 pounds until the jaw load has reached 750 pounds and operate at this load for 1 minute to determine compliance with 3.3. Perform test on three replicate samples.
- \* 4.8 Firing residue removal. Weigh  $5 \pm .5$  grams (.1g precision) of WC844 propellant powder into a tared (T), clean porcelain evaporating dish (round bottomed type) of approximately 102mm (4 in) in diameter. Ignite the propellant with a Bunsen burner and allow dish to cool for 20 minutes. Invert the dish, rap it sharply several times against the table top and then blow it out with a 15 psi stream of filtered air, through a hose of approximately 1.3cm (1/2 inch) diameter, to remove any non-adhering residue. The dish shall be held approximately 15cm (6 inches) from the end of the air hose. Weigh the dish ( $W_1$ ) and add  $25 \pm 1$  ml of the lubricant and permit it to soak for  $45 \pm 3$  min at  $54.4 \pm 1^\circ\text{C}$  ( $130 \pm 2^\circ\text{F}$ ) in a convection oven. At the end of the 45 minute period, remove the dish and immediately swab the residue with a double layer of cotton guaze pad (see 6.8) wrapped around and fastened to the wide end of a No. 4 Coors porcelain pestle. The pestle should measure approximately 178mm (7 in) long by 52mm (2 1/16 in) at its widest point and weigh approximately 300 g. Swab the dish in both a circular and back and forth motion for a period of 90 sec. letting the weight of the pestle perform the actual removal of the residue. Do not apply any downward force to the pestle. After swabbing, decant the remaining oil and thoroughly wash the inside of the dish with 75cc of petroleum either in accordance with O-E-751. Heat the evaporating dish to  $54.4 \pm 1^\circ\text{C}$  ( $130 \pm 2^\circ\text{F}$ ) for  $30 \pm 2$  minutes, cool to room temperature and weigh ( $W_2$ ). Calculate the percent of residue removed by the equation:

$$\% \text{ residue removal} = 100 \times \frac{W_1 - W_2}{W_1 - T}$$

Where:

$W_1$  - first gross weight of residue

$W_2$  - gross weight after heating

T - tar of evaporating dish



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4.9 Corrosion. Use specimens 1/4 by 1 by 2 inches made from the following metals for the corrosion test:

<u>Metal</u>	<u>In accordance with specification</u>
Zinc	MIL-A-18001
Aluminum	QQ-A-250/4
Brass	QQ-B-626, composition 22 (leaded brass)
* Steel	ASTM A109
Copper	QQ-C-576
Magnesium	QQ-M-44, AZ31B (Condition H24 or H26)
Cadmium	QQ-A-671

Polish all surfaces of the specimens using progressively finer abrasive paper, finishing with a 240-grit polishing medium. Hold the specimens with tongs or filter paper. Do not touch them with the fingers. The use of a slow speed horizontal metallurgical polishing wheel is convenient, with the final polishing being done with 240-grit aluminum oxide paper or cloth moistened with dry cleaning solvent conforming to P-D-680. The use of "wet or dry" cloths or "wet or dry" papers is prohibited. Specimens shall be cleaned by swabbing in hot naphtha with a final rinse in warm anhydrous methanol conforming to grade A of O-M-232 (use 95 percent methanol for the magnesium specimen). The specimens shall be held in a manner to avoid contact with the operator's hands. After weighing, place the specimens in the order as listed above along one diameter of the jar. Stand the specimens on one of their narrow ends and separate them from each other by glass-rod separators. The specimens shall be covered with enough compound (approximately 300 ml) so that the tops of the specimens are at least 1/4 inch below the surface of the compound. The sealed jar shall then be placed in an oven at  $130^{\circ} \pm 2^{\circ}\text{F}$  ( $54.4^{\circ} \pm 2^{\circ}\text{C}$ ) for 7 days  $\pm$  15 minutes. Upon completion of the test, remove the compound and any loose corrosion products from the specimens by swabbing with surgical gauze pads moistened with naphtha, then with methanol (use 95 percent methanol for the magnesium specimen), and follow by clean solvent rinses. Reweigh the specimens and calculate the weight loss or gain in milligrams per square centimeter.

4.10 Corrosion-protection, humidity cabinet. Test the compound for humidity cabinet corrosion protection in accordance with method 5329, Fed Test Method Std. No. 791.

4.11 Corrosion-protection, salt spray resistance. Test the compound for salt spray resistance (5 percent solution) in accordance with method 4001, Fed. Test Method Std. No. 791. Use three test panels prepared in accordance with Fed. Test Method Std. 791, method 5329, starting with paragraph 5.1 through paragraph 5.3b.

4.12 Water displacement and water stability. Conduct the water displacement and water stability test in accordance with Fed. Test Method Std. No. 791, method 3007 except that the test shall be made only on the compound-water mixture.

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4.13 Residue and fluidity at low temperature. Twenty-five milliliters (ml.) of the cleaner shall be placed in a flat bottom pertri dish, approximately 10 centimeters (cm.) in diameter, and heated in an oven maintained at  $54.4 \pm 2^{\circ}\text{C}$  ( $130 \pm 5^{\circ}\text{F}$ ) for 40 hours. At the end of the heating period, the sample shall be cooled at  $25 \pm 2^{\circ}\text{C}$  ( $77 \pm 5^{\circ}\text{F}$ ) and examined for tackiness by touching the residue. A visual examination shall be made for particle contamination. A sufficient quantity of the residue shall be placed upon the end of a glass slide approximately 1 by 3 inches. Another slide shall be placed over the residue so that an overlap of approximately one square inch is formed. A one kilogram weight is placed on the test area for 30 seconds. The weight is then removed and the slides subjected to  $-53.8^{\circ} \pm 3^{\circ}\text{C}$  ( $-65 \pm 5^{\circ}\text{F}$ ) for 24 hours. While at a temperature of  $-53.8^{\circ}\text{C}$  ( $-65 \pm 5^{\circ}\text{F}$ ) the two slides shall be separated by hand using a sliding action. If no movement is detected within a period of one second the material shall be rejected.

- \* 4.14 Interference with chemical agent detector paper. On a three inch length of ABC-M8 chemical agent detector paper place one drop of compound (sufficient for a 1/4 inch size strain) directly from the lubricant container onto the paper. Shake the container for 10-15 seconds before placing the compound on the paper. This test shall be run on three different pieces of ABC-M8 chemical agent detector paper. The paper should be observed for color change after 5 minutes from the time of placing the compound on the paper. The compound will be considered unacceptable if any paper shows any coloration (pink, orange, red-brown, yellow, green, blue are examples of unacceptable colors).

4.15 Toxicity. The supplier shall furnish the qualifying activity (see 6.3) with all the information necessary to evaluate the safety of the product. Such information shall be furnished in one of the following forms, at the discretion of the qualifying activity:

- a. A complete listing of the constituent materials, giving the percentage of composition and using standard chemical nomenclature. (This is the simplest and most direct method. In most instances, it will completely satisfy the requirement for information.)
- b. The results of toxicological testing of a scope and quality acceptable to the qualifying activity.
- c. Some other form acceptable to the supplier and to the qualifying activity.

All information furnished by the supplier in connection with the evaluation of toxicity shall be signed by a responsible official of the supplying firm. Such information shall be held in strict confidence by the qualifying activity and shall not be divulged to other suppliers.

- \* 4.16 Gun performance. The overall performance of the test compound shall be determined by utilizing 7.62mm M60 or M60D machine guns, air-cooled, link-belt fed, and gas operated.

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\* 4.16.1 Inspection. Select an M60 or M60D Light Machine Gun. Disassemble and note the headspace, bore-diameter, chamber dimensions, firing pin pro-trusion and indentation, trigger pull and overall condition. While disassembled, clean all traces of lubricant and dirt by washing with a volatile mineral spirits, such as P-D-680 Dry Cleaning Solvent or TT-N-95 Naphtha. After complete removal of the solvent from all surfaces of the gun by use of a water-free air hose or by air-drying, all components except the barrel shall be coated with the test lubricant by brushing or lint-free patch. A lint-free patch shall be dipped in the test oil and then squeezed to remove excess oil. The gun shall then be reassembled and bench tested for operational use. The gun shall then be test fired for 20 rounds in an ambient temperature of 50° to 100°F (10° to 37.8°C) and the cycle rate of fire recorded. Upon satisfactory completion of the ambient temperature test, the gun shall be disassembled, cleaned and relubricated for the next phase of test.

4.16.1.1 Cold temperature test. With the bolt in the rearward (firing) position and the selector lever set on "safe" the weapon shall be loaded with a 50-round belt of ammunition and conditioned at  $-50^{\circ} \pm 5^{\circ}\text{F}$  ( $-45^{\circ} \pm 2^{\circ}\text{C}$ ) for  $16 \pm 1$  hours. The weapon shall then be placed in the firing fixture, the selector level set on "fire" and the entire 50 rounds fired with one pull of the trigger, recording the cyclic rate of fire. Reload the weapon as above and condition at  $-50^{\circ} \pm 5^{\circ}\text{F}$  ( $-45.5^{\circ} \pm 2^{\circ}\text{C}$ ) for an additional 3 hours. Fire the entire 50 rounds and again record the cyclic rate of fire.

4.16.1.2 Dynamic dust test. The weapon shall be disassembled, cleaned and lubricated with the test lubricant. Three firing cycles of 7.62mm Combat Mix shall be fired from within the dust chamber in accordance with the procedures and specification of MTP-3-2-045 (M60 Machine Gun). Between each firing cycle, the weapon shall be stripped, cleaned and lubricated. The firing cycle consists of 200 rounds of Combat Mix (M60 Machine Gun). Cyclic rates will be determined during each cycle. Muzzle velocities of the last 10 rounds of each cycle will be recorded and critical dimensions again determined at the completion of the test.

4.16.1.3 Salt water immersion test. Use the weapon previously fired in the Dust test (4.16.1.2). The test will be conducted in accordance with the procedures and specifications MTP-3-2-045 (M60 Machine Gun) except that a 5 percent salt water solution shall be used.

The Machine Gun and two (2) belts of 100 rounds will be immersed for sixty (60) seconds and after removal the salt solution drained from the bore. The full complement of 200 rounds will be fired; the first belt interrupted burst and the second belt continuous automatic burst. There will be no barrel change during this test.

Using clean ammunition repeat the firing cycles on the Machine Gun, four (4) additional times on the third, fifth, eighth, and tenth day following the first firing. Do not clean or add lubricant during these additional firings. Between firings store the weapon in a humidity chamber at conditions specified in Table IX of MTP-3-2-045 (M60).

4.17 Leakage (from gas-pressurized cans only). Immerse a pressurized can completely for five minutes in water maintained at  $54^{\circ} \pm 2^{\circ}\text{C}$  ( $130^{\circ} \pm 3^{\circ}\text{F}$ ). Observe the can for emission of bubbles or distortion during the test period.

4.18 Rejection of lots. If the sample of compound fails to meet any of the specified tests, reject the lot represented by this sample.

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## 5. PACKAGING

5.1 Packaging, packing, and marking. Unless otherwise specified in the contract or purchase order (see 6.2), packaging, packing and marking shall be in accordance with MIL-STD-290.

## 6. NOTES

6.1 Intended use. The compound covered by this specification is a highly penetrating, mobile liquid and is intended for field application to satisfy the complete need of cleaning, lubricating, and preserving both small and large caliber weapons. The compound facilitates the effective removal of firing residues, gums and other contaminants from weapon components while at the same time provides adequate lubrication and preservation for reliable, durable operation in all climatic conditions, temperatures ranging from -53.9° to 65.5°C (-65° to 150°F).  
\* The compound will be used in lieu of MIL-C-372 (RBC), VV-L-800 (PL-S), MIL-L-3150 (PL-M), MIL-L-14107 (LAW) and MIL-L-46000 (LSA) for specific applications where tests have shown it to be satisfactory in small and large caliber weapons.

6.1.1 Other uses. This compound may be used in other cleaning, lubricating, and preserving applications where tests have shown it to be satisfactory for that specific application.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Quantity of lubricating oil required.
- c. Type and size of container (see 5.1).
- d. Level of packaging and packing (see 5.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids, qualified for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or  
\* orders for the products covered by this specification. The activity responsible for the Qualified Products List is US Army Armament Research and Development Command ATTN: DRDAR-TST-S, Dover, New Jersey, 07801.

6.4 Units of measure. In sections of this specification where U.S. customary units are given first with metric units in parenthesis, the U.S. customary units should be considered as the standard. Metric units have been rounded off and are not in many instances, precise equivalents of the U.S. units.

6.5 Chemical agent detector paper. Paper, Chemical Agent Detector, ABC-M8, NSN: 6665-00-050-8529 will be used for tests. For each lot of lubricant tested, five booklets of M8 Paper will be required.

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6.6 National stock numbers. The following National Stock Numbers have been assigned to the compound covered by this specification:

9150-01-079-6123	1.1 fl. oz. plastic bottle IAW drawing.
9150-01-079-6124	4 fl. oz. (120 ml) plastic bottle with extender tube.
9150-01-079-6125	15.83 oz. (450 g) aerosol can with extender tube.
* 9150-01-053-6688	1-gal. (3.785 litres) plastic bottle.
* 9150-01-054-6453	1-pt. (480 ml) plastic bottle with trigger sprayer.

\* 6.7 WC 844 Propellant. Propellant referenced in 3.4 and required for the performance of the test per 4.8 may be obtained upon request from the activity responsible for the Qualified Products List, as indicated in 6.3.

\* 6.8 Cotton gauze pads. Commercial laboratories attempting to duplicate this test may use Webril Handi-Pads 7 1/2" x 3 7/8" (unfolded), source: Kendal Co., Graphic Arts Products, Boston, MA 01201.

6.9 Changes from previous issue. The margins of this specification are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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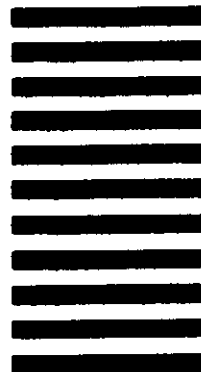
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