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SUPERSEDING  
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## MILITARY SPECIFICATION

### CORROSION PREVENTIVE COMPOUND, PETROLATUM

#### BOT APPLICATION

This specification is approved for use by all Departments and Agencies of the Department of Defense

#### 1. SCOPE

1.1 Scope. This specification covers a suitably formulated petrolatum-base corrosion preventive compound (see 6.1).

1.2 Classification. Corrosion preventive compound shall be of the following classes, as specified (see 6.2):

- Class 1 - Hard-film compound
- Class 1A - Hard-film compound, non-slick
- Class 2 - Medium-film compound
- Class 3 - Soft-film compound

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

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Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Director, US Army Laboratory Command, Materials Technology Laboratory, ATTN: SLCMT-MSE, Watertown, MA 02172-0001 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

## FEDERAL

- 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-613 - Brass, Leaded and Non-Leaded; Flat Products (Plate, Bar, Sheet and Strip).
- QQ-L-201 - Lead Sheet.
- QQ-M-44 - Magnesium Alloy, Plate and Sheet (AZ31b).
- TT-N-95 - Naphtha, Aliphatic.

## MILITARY

- MIL-P-116 - Preservation; Methods of.
- MIL-L-6082 - Lubricating Oil; Aircraft Reciprocating Engine Piston.
- MIL-A-18001 - Anode, Corrosion Preventive, Zinc, Slab Disc and Rod Shaped

## STANDARDS

## FEDERAL

- Federal Test Method Standard No. 141 - Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling, and Testing.
- Federal Test Method Standard No. 791 - Lubricant, Liquid Fuel, and Related Products; Methods of Testing.

## MILITARY

- MIL-STD-290 - Packaging, of Petroleum and Related Products.

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

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- A568 - General Requirements for Steel, Carbon and High Strength Low Alloy Hot-Rolled Sheet and Cold-Rolled Sheet
- D92 - Test Method for Flash and Fire Points by Cleveland Open Cup.
- D127 - Test Method for Drop Melting Point of Petroleum Wax, Including Petrolatum.

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- D822 - Recommended Practice for Operating Light and Water Exposure Apparatus (Carbon Arc Type) for Testing Paint, Varnish, Lacquer and Related Products.
- D874 - Test Method for Sulfated Ash from Lubricating Oils and Additives.
- D937 - Test Method for Cone Penetration of Petrolatum.
- D1748 - Test Method for Rust Protection by Metal Preservatives in the Humidity Cabinet.
- G23 - Recommended Practice for Operating Light and Water Exposure Apparatus (Carbon Arc Type) for Exposure of Nonmetallic Materials.

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

(Non-Government standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 Qualification. The corrosion preventive compounds furnished under this specification shall be products which are qualified for listing on the applicable qualified products list (see 4.5.1, 6.3).

3.2 Material. The corrosion preventive compound shall be a petrolatum which has been modified to meet the specified requirements. The material shall be free from grit, water, and other impurities, and shall not be injurious in any way to personnel in its intended use.

3.3 Physical requirements. The corrosion preventive compound shall conform to the following physical requirements (see 4.6.1).

	<u>Class 1 or 1A</u>	<u>Class 2</u>	<u>Class 3</u>
Penetration, tenths of mm.	30-80	90-150	200-250
Flash point, minimum	350°F (177°C)	350°F (177°C)	350°F (177°C)
Melting point, minimum	155°F (68°C)	150°F (66°C)	135°F (57°C)

3.4 Sulfated residue. The sulfated residue of each product will be established when qualification tests are conducted (see 4.6.1).

3.5 Stability. The compound shall not foam and shall not separate into different phases after storage at 225°F (107°C) and -40°F (-40°C) (see 4.6.2).

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3.6 Volatility. The compound shall not volatilize more than 1.0 percent, by weight, when heated for 3 hours at 221°F - 230°F (105°C - 110°C) (see 4.6.3).

3.7 Oxygen absorption (applicable to Class 3 only). The pressure drop in the oxygen bomb shall not exceed 10 pounds per square inch after 100 hours at 210°F (99°C) (see 4.6.4).

3.8 Miscibility with lubricating oil (applicable to Class 3 only). A mixture of the compound and lubricating oil conforming to Grade 1100 of MIL-L-6082 shall show no separation after storage at 170°F (77°C) (see 4.6.5).

3.9 Abrasives. The total volume of centrifuged sediment shall not exceed 0.05 milliliters (ml.) and shall contain no abrasives which can produce scratches on glass slides (see 4.6.6).

3.10 Slick (applicable to Class 1A only). The compound shall not leave an oil slick on salt water (see 4.6.7).

Note. Slick is defined as an oily film floating on salt water.

3.11 Applicability. The compound shall be of such consistency that coatings 1.50 + 0.2 mils in thickness can be readily applied to steel panels (see 4.6.8.1).

3.11.1 Application Temperature. The maximum permissible temperature of application of the compound shall be as indicated below for the specified class:

Class 1 or 1A	+ 200°F (93°C)
Class 2	+ 190°F (88°C)
Class 3	+ 180°F (82°C)

### 3.12 Corrosion protection.

3.12.1 Humidity cabinet. Class 3 compound shall be capable of protecting test panels against corrosion during continuous condensation at temperatures up to 120°F (49°C) (see 4.6.8.1).

3.12.2 Accelerated weathering. Class 1, 1A or 2 compound shall protect test panels against corrosion for a minimum of 300 operating hours (see 4.6.8.2).

3.12.3 Corrosiveness. The compound shall produce no visible corrosive effects, such as staining, pitting or etching of the test specimens, nor shall it produce any weight gain or loss in excess of the following:

<u>Metal</u>	<u>Milligrams per square Centimeter</u>
Aluminum	0.2
Brass	0.2
Cadmium	0.2
Magnesium	0.5
Steel	0.2
Zinc	0.2

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In addition to the above requirements, Class 3 compound shall not produce a weight gain or loss of more than 1.0 milligram per square centimeter on the lead specimen (see 4.6.8.3).

3.12.4 Stain (Applicable to Class 3 only). The original material, the 5 percent, and the 15 percent water emulsions of the compound shall not produce any stain, discoloration, or corrosion of the polished steel test panels (see 4.6.8.4).

3.13 Low temperature adhesion. A test panel coated with the compound shall produce no flaking when tested after exposure at  $-40 \pm 3^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$ ) for a minimum of one hour (see 4.6.9).

3.14 Flow point. The compound shall not flow at temperatures lower than the temperatures indicated below for the specified class (see 4.6.10).

Class 1 or 1A	+ 150°F (65°C)
Class 2	+ 145°F (62°C)
Class 3	+ 130°F (54°C)

3.15 Removability.

3.15.1 After accelerated weathering. Class 1, 1A, or 2 compounds shall require not more than 15, 15, or 10 wiping cycles, respectively, for removal from the test panels at the completion of the accelerated weathering test (see 4.6.11).

3.15.2 After outdoor storage. Class 1, 1A or 2 compounds shall require not more than 150 wiping cycles for removal from the test panels at the completion of the outdoor storage test (see 4.6.11).

3.15.3 After shed storage. Class 3 compound shall require not more than 8 wiping cycles for removal from the test panels at the completion of the shed storage test (see 4.6.11).

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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. A lot shall consist of a manufacturer's batch of the compound. In case the material cannot be identified by batch, a lot shall then consist of not more than 15,000 pounds of the compound offered for delivery at one time.

4.3 Sampling.

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4.3.1 Sampling material for testing. A composite sample weighing at least 10 pounds shall be taken from each lot in accordance with Method 8001 of Federal Test Method Standard No. 791. The samples shall be placed in clean, dry metal containers and forwarded to the test laboratory specified in the contract. The containers shall be marked as follows:

Sample for acceptance tests.  
This specification number.  
Name of manufacturer.  
Manufacturer's Code number.  
Batch or lot number.  
Contract or order number.  
Date of sampling.

4.3.2 Qualification test samples. Qualification samples shall consist of approximately 40 pounds of the compound supplied in a top opening 5 gallon container.

4.3.2.1 The qualification samples shall be accompanied by the following information and test data:

- (a) Formulation of the compound, including the percentage by weight of the ingredient materials. The corresponding chemical names of the ingredient materials, in addition to their trade names, shall be furnished.
- (b) Results of all applicable tests except for the outdoor and shed storage tests, and the removability tests following storage.

4.4 Inspection.

4.4.1 Inspection of material. Inspection shall be in accordance with Method 9601 of Federal Test Method Standard No. 791.

4.4.2 Inspection of packaging. The containers shall be inspected for fill, closure, evidence of leakage, and marking to determine compliance with MIL-STD-290.

4.5 Classification of tests.

4.5.1 Qualification tests. Qualification tests shall consist of all the tests of this specification.

4.5.2 Acceptance tests. Acceptance tests shall consist of all the tests of this specification.

4.6 Tests.

4.6.1 Physical and chemical tests. The physical and chemical tests shall be conducted as follows:

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(a) Penetration	ASTM D937
(b) Flash point	ASTM D92
(c) Melting point	ASTM D127
(d) Sulfated residue	ASTM D874

4.6.2 Stability. Melt approximately 15 grams of the compound by heating at a lower temperature than the maximum permissible temperature of application (see 3.11.1). Pour the molten sample into a 25 by 150 mm test tube and heat for 1-1/2 hours in an oven maintained at 221° to 230°F (104° - 110°C). Observe the sample for foaming during the first half-hour. Remove the sample from the oven, allow it to stand for one hour at 75 ± 5°F (24° ± 3°C), and follow up with cooling for one hour at -40 ± 3°F (-40 ± 1°C). At the end of the cooling period reheat the sample for one hour at 221° to 230°F (104° - 110°C). Remove the sample from the oven without tipping or shaking and examine for separation into different phases. Re-examine the sample when it has cooled to room temperature.

4.6.3 Volatility. Weigh approximately 1.5 grams of the compound in a tared aluminum dish having a diameter of approximately 2-1/2 inches. Determine the weight of the sample to the nearest milligram. Heat the dish and its contents for 3 hours in a mechanical convection oven maintained at 221° to 230°F (104° - 110°C). Remove the dish from the oven, cool in a desiccator for at least 1/2 hour, and weigh to the nearest milligram. Calculate the loss in weight of the sample to percent volatile content of the compound.

4.6.4 Oxygen absorption (Class 3 only). The oxygen absorption characteristics of the compound shall be determined in accordance with Method 3453 of Federal Test Method Standard No. 791, except that brass catalysts, prepared as specified in 4.6.4.1, shall be used in making the determination.

4.6.4.1 Preparation of brass catalysts. Prepare 5 discs, each 1-5/16 inches in diameter and 0.050 inch in thickness, using brass plate conforming to composition E of Specification QQ-B-613. The discs shall be thoroughly washed in alkaline cleaning solution (6 ounces of commercial grade sodium metasilicate per gallon of solution) and rinsed with cold running tap water. The disc shall then be immersed for 20 seconds in an etching solution having the following composition:

450 ml. of distilled water.  
 225 ml. of concentrated nitric acid, ACS  
 300 ml. of concentrated sulfuric acid, ACS  
 8 ml. of concentrated hydrochloric acid, ACS.

After being etched the discs shall be rinsed with cold running tap water and immersed momentarily in a color dip solution having the following composition:

770 ml. of distilled water  
 68 grams of sodium dichromate, ACS  
 15 ml. of sulfuric acid, ACS.

The discs shall then be rinsed with distilled water and dried for 1/2 hour in an oven maintained at 221° to 230°F (104° - 110°C).

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4.6.4.2 Procedure. A brass catalyst disc shall be placed at the bottom of each glass dish and covered with  $4.0 \pm 0.01$  grams of the compound. The remainder of the determination shall be carried out in accordance with Method 3453 of Federal Standard No. 791.

4.6.5 Miscibility with lubricating oil (Class 3 only). A mixture composed of 5 parts by weight of the compound, and 95 parts of lubricating oil conforming to grade 1100 of MIL-L-6082, shall be placed in a 35-by-200 mm. test tube. The tube and its contents shall be heated for one hour in an oil bath maintained at  $170^{\circ} \pm 2^{\circ}\text{F}$  ( $77^{\circ} \pm 1^{\circ}\text{C}$ ). The tube shall then be removed, stoppered with a cork while still hot, and agitated vigorously for 1/2 minute. The tube shall be returned to the oil bath and reheated for 1 hour. The mixture shall be examined for miscibility while still hot, and again after cooling to  $75^{\circ} \pm 5^{\circ}\text{F}$  ( $24^{\circ} \pm 3^{\circ}\text{C}$ ). After being exposed to room temperature for 20 hours, the mixture shall again be examined for separation of the compound and the oil.

4.6.6 Abrasives. Dissolve 5 grams of the compound in a small portion of methyl chloroform, and pour the dissolved sample into a cone-shaped centrifuge tube. Add methyl chloroform to make a total volume of 100 milliliters. The apparatus and procedure described in paragraphs 3 and 5 of method 3101 of Federal Standard No. 791 shall be used in making the sedimentation of the material for the abrasive determination. However, only one test shall be made on each sample of the compound, instead of the duplicate test stipulated by the specified method. The total volume of the centrifuged sediment shall not exceed 0.05 milliliters.

Decant all but a few milliliters of the supernatant liquid. Remove a small amount of the sedimented material with a pipette, or with a long medicine dropper. Place a few drops of the material on a new clean microscope glass slide, and allow the solvent to evaporate at room temperature. After evaporation rub a similar slide against the side of the slide containing the dried residue, and examine both slides for scratches. Any scratching of the glass slides shall be attributable to the presence of abrasives in the compound.

4.6.7 Slick (Class 1A only). Coat the blades of a laboratory stirrer with the compound by immersing the shaft for 1 minute to a depth of 1 inch in the compound held at a temperature of  $190^{\circ}\text{F}$  ( $88^{\circ}\text{C}$ ). Allow to drain and cool to  $75^{\circ} \pm 5^{\circ}\text{F}$  ( $24^{\circ} \pm 3^{\circ}\text{C}$ ). Place a beaker containing 200 ml. of 4-percent sodium chloride solution at  $100^{\circ}\text{F}$  ( $38^{\circ}\text{C}$ ), so that the blades of the stirrer are submerged 1 inch beneath the surface of the solution. Allow the shaft to rotate for 3 minutes at approximately 1,500 rpm. Set the beaker on black paper in front of a window. View the surface of the salt solution at an angle of approximately  $45^{\circ}$ , to determine whether or not an oily film (slick) has been formed.

4.6.8 Corrosion protection.

4.6.8.1 Humidity cabinet. This test shall be conducted in accordance with ASTM D1748.

4.6.8.2 Accelerated weathering. Three test panels shall be cleaned and polished according to ASTM D1748 and coated according to ASTM G23 or D822.



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4.6.8.3 Corrosiveness.

4.6.8.3.1 Test specimens. The corrosiveness test shall be conducted with 1 by 2 by 1/4 inch specimens conforming to the following:

	<u>Specification</u>
(a) Brass, composition 1,	QQ-B-613
(b) Cadmium,	QQ-A-671
(c) Zinc,	MIL-A-18001
(d) Magnesium,	QQ-M-44
(e) Aluminum, condition T,	QQ-A-250/4
(f) Steel,	ASTM A568
(g) Lead, Grade A,	QQ-L-201

4.6.8.3.2 Preparation of test specimens. The specimens shall be polished to remove pits, burrs and irregularities from the faces and edges, finishing with a 240 grit polishing medium. The specimen shall be held in a suitable holder to avoid contact with the hands. After polishing, the specimens shall be cleaned by swabbing in hot naphtha as TT-N-95 and a final rinse in warm methanol as in O-M-232. The methanol should be diluted with approximately 5 parts by volume of distilled water for use in rinsing the magnesium specimens.

4.6.8.3.3 Test procedure. Weigh the polished and cleaned specimens accurately and, with the exception of the lead specimen (see 4.6.8.3.3.1), stand them on end around the inner perimeter of a wide-mouth jar, approximately 3 inches in diameter, and having a tight-fitting screw cap. The specimens shall be placed clockwise in the order in which they are listed in 4.6.8.3.1, using glass separators between them, if necessary. Cover the specimens with approximately 300 ml. of the compound, heated to  $180^{\circ} \pm 3^{\circ}\text{F}$  ( $82^{\circ} \pm 2^{\circ}\text{C}$ ) prior to use in the test. Seal the jar tightly, and place it for 14 days in an oven maintained at  $180^{\circ} \pm 3^{\circ}\text{F}$  ( $82^{\circ} \pm 2^{\circ}\text{C}$ ). At the end of this period the specimens shall be removed from the jar and, while still hot, the compound and any loose corrosion products shall be removed by swabbing with naphtha, followed by methanol, using surgical-gauze or absorbent-cotton pads. Each swabbing operation shall be followed by rinsing with clean portions of naphtha as in TT-N-95 and methanol as in O-M-232 successively. Air dry the specimens and weigh them accurately. Calculate their weight loss in terms of milligrams per square centimeter of specimen surface.

4.6.8.3.3.1 The weighed lead specimen shall be covered separately with approximately 50 grams of compound which has been heated to  $180^{\circ} \pm 3^{\circ}\text{F}$  ( $82^{\circ} \pm 2^{\circ}\text{C}$ ) prior to use in the test. A suitable glass container, such as a test tube, shall be used for holding the lead specimen and the molten compound. The lead specimen shall be subjected to the same oven test as the other specimens, and its weight loss likewise determined.

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**4.6.8.4 Stain (Class 3 only).**

**4.6.8.4.1 Test panels.** Six test panels shall be cleaned and polished in accordance with ASTM D1748 for this test.

**4.6.8.4.2 Water emulsions.** A 5-percent and a 15-percent water emulsion of the compound shall be prepared by heating 95 and 85 grams, respectively, of the compound until molten, and adding 5 ml and 15 ml of distilled water, respectively, to the molten samples. The compound-water mixtures shall then be emulsified by means of a mechanical stirrer until a homogeneous mass is formed.

**4.6.8.4.3 Test procedure.** Coat the polished surfaces of two of the panels with the original compound (set No. 1), of two other panels with the 5-percent emulsion (set No. 2), and of the remaining two panels with the 15-percent emulsion (set No. 3), with the coating in each instance being approximately 5 mils in thickness. Assemble the two coated panels of each set so that the coated surfaces face each other in a sandwich-like arrangement. Apply a 100-gram load on top of each of the three assembled panel sets, and place them in a horizontal position for 24 hours in a forced-draft oven maintained at  $180^{\circ} \pm 2^{\circ} \text{ F}$  ( $82^{\circ} \pm 2^{\circ} \text{ C}$ ). At the end of the heating period remove the panels from the oven and decoat using naphtha TT-N-95. Inspect the panels for evidence of stain, discoloration, or corrosion, disregarding the outer 1/8 inch edges of the panels.

**4.6.9 Low temperature adhesion.** A test panel shall be cleaned and polished according to ASTM D1748, and coated with a film of  $1.5 \pm 0.2$  mils. After standing for approximately 16 hours, the panel shall be cooled to  $-40^{\circ} \pm 3^{\circ} \text{ F}$  ( $-40^{\circ} \pm 3^{\circ} \text{ C}$ ) and maintained at this temperature for a minimum of one hour. While at this temperature 4 parallel scratches, approximately 1/8 of an inch apart and 1 inch long, shall be made on the film in one direction, and 4 other similar scratches made at right angles to them, so as to form a checkered pattern on the coating. A 4-bladed instrument, shown in figure 1, is recommended for making the scratches. The tool shall be kept at ambient room temperature. In making the scratches the tool shall be held in such a position that the cutting edges make a  $45^{\circ}$  angle with the surface of the film, and shall be drawn at a rate of approximately 1 inch per second through the film. The compound shall be considered unsatisfactory in adhesive qualities if there is any flaking of the film within the areas bounded by the scratches. Flaking shall be defined as chipping of the film for a distance greater than 1/32 of an inch on either side of the scratch marks. If a retest is authorized by the Government in case of failure, new blades shall be used in the cutting tool to eliminate wear of the blade edges as a factor in the outcome of the retest.

**4.6.10 Flow point.** A test panel shall be cleaned and polished according to ASTM D1748, and coated with a film of 50 to 55 mils. Using a stiff spatula, knife, or razor blade remove a 1-inch strip of the coating along one of the long edges of the panel, after cutting the film parallel to the edge of the panel, and at a right angle to the surface of the panel. A straight line shall then be drawn or scratched on the panel, parallel to the cut edge of the film, and 1/8 inch away from it. The panel shall then be suspended vertically, with the exposed area downward, for 4 hours in a gravity convection oven maintained at  $150^{\circ} \pm 2^{\circ} \text{ F}$  ( $66^{\circ} \pm 1^{\circ} \text{ C}$ ) for Class 1 or 1A

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compound;  $1450 \pm 20^{\circ}\text{F}$  ( $630 \pm 10^{\circ}\text{C}$ ) for Class 2 compound; or  $1300 \pm 20^{\circ}\text{F}$  ( $550^{\circ}\text{F} \pm 10^{\circ}\text{C}$ ) for Class 3 compound. The panel shall be removed from the oven and allowed to cool to room temperature. The position of the cut edge of the coating, relative to the reference line drawn or scratched on the panel, shall then be observed. The compound shall then be considered to fail the flow point requirements if any movement of the coating toward the reference line has occurred as a result of heating at the applicable specified temperature.

4.6.11 Removability.

4.6.11.1 Apparatus. A satisfactory apparatus for determining removability property of the compound is illustrated in figure 2. The essential component of the apparatus is the rubbing device, which is shown in detail in figure 5. The device consists of a glass tube having an open bulb at one end, and a felt plug at the other end. A felt plug, which protrudes approximately 1/8-inch from the end of the tube, serves as the rubbing member. The rubbing tool is supported vertically and is drawn back and forth across the surface of the coated panel. A continuous flow of dry-cleaning solvent, conforming to P-D-680, is maintained through the tube, the felt plug, and over the test panel as the rubbing action takes place. The rubbing tool is free to exert its own weight, plus that of the solvent it contains, upon the surface of the panel. A constant head of solvent is maintained during the entire test by means of the assembly shown in figure 2.

4.6.11.2 Details of construction and operation. The following are the essential details of construction and operation of the removability apparatus:

- (a) Glass tube:
  - Length, inches - 6 (approximately)
  - Inside diameter, mm - 10
  - Outside diameter, mm - 12
- (b) Glass bulb:
  - Length, inches - 2 (approximately)
  - Outside diameter, inches - 1.5 (approximately)

Note: The glass bulb can be blown from suitable tubing, or a thistle-tube top can be fused to the glass tube. The glass-bulb shown in figure 3 can be obtained from the Corning Glass Works Co.

- (c) Felt (for making plug):
  - Composition - 100 percent wool
  - Weight, ounces per square yard - 190
  - Thickness, inches - 3/4
- (d) Funnel (thistle type):
  - Overall length, inches - 8 (approximately)
  - Outside diameter of stem, inches - 1/2
- (e) Weight of the wiping assembly  
(consisting of the glass tube, felt plug, and contained solvent),  
grams -  $45 \pm 0.5$

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- (f) Rate of efflux of the solvent,  
grams per minute -  $15 \pm 0.5$
- (g) Length of wiping strike,  
inches - 2 (approximately)
- (h) Duration of wiping cycle,  
seconds - 2 (approximately)

4.6.11.3 Test procedure. The specimens shall be placed individually in a position in the apparatus so that the felt pad wiper can wipe a streak approximately 2 inches long. The length of the wiping stroke shall be 2 inches and the speed of the machine shall be regulated to  $30 \pm 1$  cycles per minute. A complete wiping cycle shall consist of a stroke approximately 2 inches in one direction with a return stroke to the starting position. At the completion of the required number of cycles, the compound under the wiper should be completely removed (as determined visually) over an area 1/4 inch wide and the entire length of the stroke.

## 5. PACKAGING

5.1 Packaging, packing and marking. The corrosion preventive shall be packaged in 5-pound, 35-pound, or 400-pound containers, as specified by the procuring activity (see 6.2). Unless otherwise specified in the contract, the packaging, packing and marking of the corrosion preventive shall be Level B or C as specified in MIL-STD-290.

## 6. NOTES

6.1 Intended use. Corrosion preventive compound is intended for application to military materiel, as illustrated in the following nonmandatory examples:

6.1.1 Class 1 - Hard-film compound. (Corresponds to P-4 of MIL-P-116). (Applied in the molten state by dipping, brushing, swabbing, etc.):

- (a) For unshielded outdoor storage of gun tubes, etc.
- (b) For protection of small metal parts, either packaged or unpackaged.
- (c) For long-term indoor storage protection of highly finished surfaces, such as recoil mechanisms.

6.1.2 Class 1A - Hard-film compound, non-slick. (Corresponds to P-4 of MIL-P-116). (Applied in the molten state by dipping, brushing, swabbing, etc.):

- (a) For unshielded outdoor storage of gun tubes, etc.
- (b) For protection of small metal parts, either packaged or unpackaged.

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(c) For long-term indoor storage protection of highly finished surfaces, such as recoil mechanisms.

(d) For use in submarine ballast tanks.

6.1.3 Class 2 - Medium-film compound. (Corresponds to P-5 of MIL-P-116). (Applied in the molten state or above ambient temperatures by dipping, brushing, swabbing, etc.):

(a) For unshielded outdoor storage of materiel in relatively moderate climates, at temperatures not exceeding the flow point temperature of the compound.

(b) For general packaging of automotive parts, etc., for storage under conditions for which Class 3 compound is either too low in melting point, or too soft in consistency.

6.1.4 Class 3 - Soft-film compound. (Corresponds to P-6 of MIL-P-116). (Applied either by brushing or swabbing at room temperature, or by dipping in the molten state):

(a) For preservation of antifriction bearings.

(b) For use on machined surfaces for which a protective material that is brushable and easily removable at room temperature is required.

6.2 Ordering data. Procurement documents should specify the following:

(a) Title, number, and date of this specification.

(b) Class of compound required (see 1.2).

(c) Level of protection required. (see 3.12)

(d) Size of container required. (see 5.1)

(e) Name and address of testing laboratory (see 4.3.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for such products as have, prior to bid opening date, been tested and approved for inclusion in the applicable Qualified Products List, whether or not such products have actually been so listed by that date. The attention of 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 products covered by this specification. The activity responsible for the Qualified Products List is the Commander, ARDC, ATTN: SMCAR-ESC-AS, Dover NJ 07801-5001, and information pertaining to qualification of products may be obtained from that activity.

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6.4 Qualification approval test data on approved products required for conducting the sulfated residue test is available upon request. This information may be obtained from the Commander, ARDC, ATTN: SMCAR-ESC-AS, Dover, NJ 07801-5001.

6.5 Subject term (key word) listing.

Corrosion  
Corrosion preventive  
Petrolatum  
Specification  
Test Methods

Custodians:

Army - MR  
Navy - SM  
Air Force - 99

Preparing activity:

Army - MR

Project No. 8030-0475

Review Activities:

Army - SM

User activity:

Army - AL

(KBWP; ID-0362A/DISK 0109A. FOR MTL USE ONLY)

MIL-C-11796C

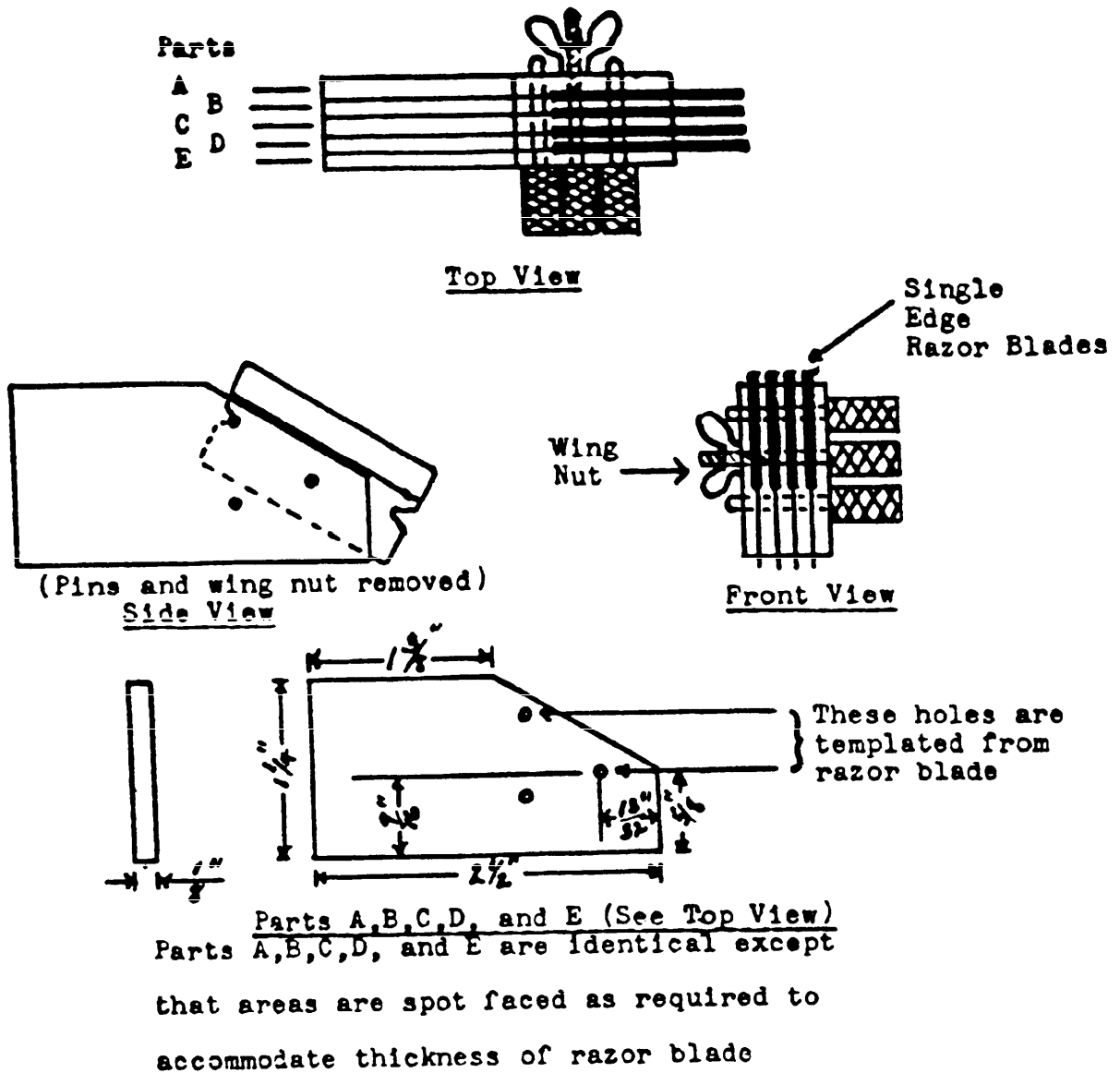


FIGURE 1. Scratching tool used in the low-temperature adhesion test.

MLL 0-117900

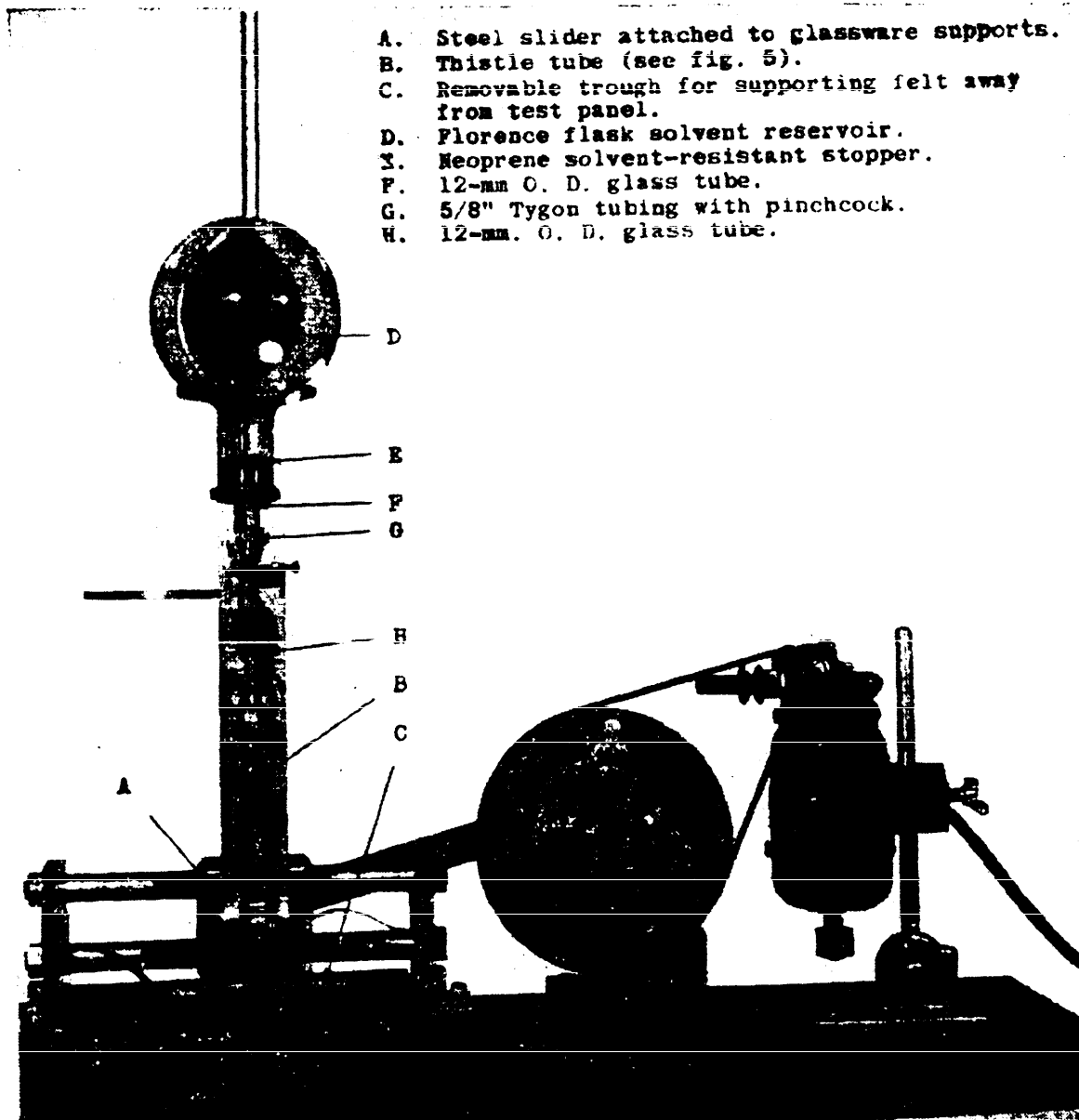


FIGURE 1. Apparatus for determining removability of the corrosion preventive compound.



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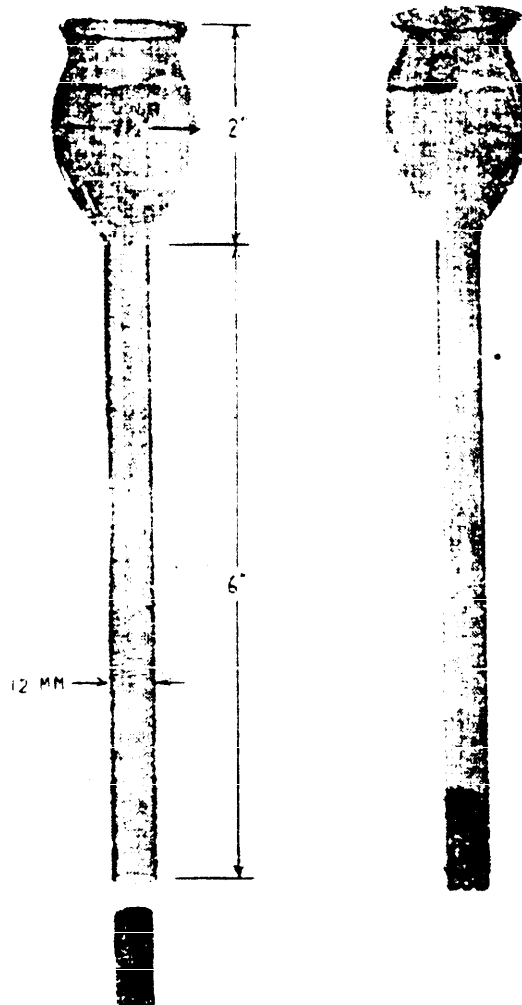


FIGURE 3. Rubbing device used in the removability apparatus  
(see figure 1).

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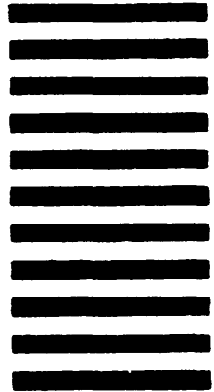
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## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-C-11796C		2. DOCUMENT TITLE CORROSION PREVENTIVE COMPOUND, PETROLATUM HOT APPLICATION	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one) <input type="checkbox"/> VENDOR <input type="checkbox"/> USER <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> OTHER (Specify): _____	
b. ADDRESS (Street, City, State, ZIP Code)			
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional		8. DATE OF SUBMISSION (YYMMDD)	