

MIL-C-83933
29 Sept 1967

MILITARY SPECIFICATION

CORROSION PREVENTIVE COMPOUNDS

COLD APPLICATION (FOR MOTOR VEHICLES)

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

1. SCOPE

1.1 Scope. This specification covers four grades of solvent dispersed corrosion preventive compounds for motor vehicles.

1.2 Classification. Corrosion preventive compounds shall be of the following grades, as specified (see 6.1):

Grade 1 - Hard film for undercarriage.

Grade 2 - Thin film clear for exterior surfaces.

Grade 3 - Hard thin film for radiators.

Grade 4 - Thin film for electrical systems.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein:

SPECIFICATIONS

Federal

O-M-232	Methanol (Methyl Alcohol)
NN-P-515	Plywood, Container Grade
QQ-S-698	Steel, Sheet and Strip, Low-Carbon
TT-E-485	Enamel, Semi-Gloss, Rust-Inhibiting

FSC 8030

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TT-N-95	Naphtha, Aliphatic
PPP-B-576	Box, Wood, Cleated, Veneer, Paper Overlaid
PPP-B-585	Boxes, Wood, Wirebound
PPP-B-591	Boxes, Fiberboard Wood-Cleated
PPP-B-601	Boxes, Wood, Cleated, Plywood
PPP-B-621	Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	Boxes, Fiberboard
PPP-C-96	Cans, Metal, 28 Gage and Lighter
PPP-D-729	Drums: Metal, 55-Gallon (for shipment of non-corrosive materials)
PPP-P-704	Pails, Shipping, Steel (1 through 12 Gallons)

STANDARDSFederal

FED-STD-141	Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling and Testing
FED-STD-791	Lubricants, Liquid Fuel, 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 and drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing Materials

D92-66	Method of Test for Flash and Fire Points by Cleveland Open Cup
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D95-65	Method of Test for Water in Petroleum and Other Bituminous Materials
D130-65	Method of Test for Copper Corrosion by Petroleum Products, Copper Strip Test
D270-65	Method of Sampling Petroleum and Petroleum Products
D874-63	Method of Test for Sulfonated Ash From Lubricating Oils and Additives
D-1748-62	Method of Test for Rust Protection by Metal Preservatives in the Humidity Cabinet

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

Official Classification Committee Uniform Freight Classification Committee

(Application for copies should be addressed to the Official Classification Committee, 1 Park Avenue at 33rd St., New York, NY 10016.)

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

3. REQUIREMENTS

3.1 Qualification. The 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).

3.2 Reports. The manufacturer shall furnish with the initial request for qualification a certified test report on all the tests specified herein to the qualifying activity. Unless otherwise specified the manufacturer may use his own facilities or any commercial laboratory acceptable to the Government.

3.3 Material. The corrosion preventive compound shall be composed of non-volatile base material dispersed in a petroleum solvent so as to form a fluid formulation that will meet the requirements of this specification. The compound shall be homogeneous, free from grit and abrasives, and shall not be injurious in any way to personnel employing it if reasonable procedures and safety precautions are employed. No benzol or chlorinated hydrocarbons shall be used.

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3.3.1 The materials furnished under this specification shall not have an undesirable effect on the performance or materials of construction of motor vehicles.

3.3.2 Any change in formulation of a qualified product will necessitate its requalification. The material supplied under contract shall be identical within manufacturing tolerances to the product receiving qualification.

3.4 Film Characteristics.

3.4.1 Grades 1, 2, 3, and 4. The compounds shall readily wet the surfaces of the test panel and upon evaporation of the solvent the resultant coating shall be continuous. Upon completion of the accelerated weathering test the specimen (Grades 2 and 3) shall show no evidence of cracking. Specimens that exhibit evidence of checking, alligatoring, or other irregularities shall be evaluated as specified in 4.6.3 (refer to FED-STD-141 for definition of terms).

3.4.2 Grade 2. The compound shall be transparent during the protective life of the coating (see 4.6.9).

3.5 Nonvolatile Content. The nonvolatile content percent by weight for each product will be established when qualification tests are conducted but shall not be less than 52 percent based on the compound as received as being 100 percent. The nonvolatile content of any succeeding lot of the product shall be no lower and not more than 5 percent higher than the established value (see 4.6.1).

3.6 Sprayability and Low Temperature Fluidity. The compound shall be sprayable from 0° to 100°F and shall have a minimum flow rate of 20 grams per second at 0°F (see 4.6.4).

3.7 Physical and Chemical Requirements. The compound shall conform to the physical and chemical requirements specified in Table I and paragraphs 4.6.1 through 4.8.

TABLE I

<u>Requirement</u>	<u>Value</u>
Flash Point °F (Min)	100
Water Content, Percent (Max)	1.0
Copper Strip Corrosion at 212°F, Appearance (Max)	Less than ASTM Nr 3
Fire Point °F (Min)	105

3.8 Sulphated Residue. The sulphated residue of each product will be established when qualification tests are conducted. When the established value of the accepted sample is 0 to 0.50 percent, the sulphated residue of any succeeding lot shall be ± 0.05 (absolute value) with a zero minimum. When the established value of the accepted sample is 0.15 percent and up, the sulphated residue of any succeeding lot shall be plus or minus 10 percent of the established value (see 4.6.1). The deviations permitted herein are manufacturing tolerances and are separate from those indicated in 4.6.1 which latter deviations reflect the accuracy of the method.

3.9 Condition in container. The compound shall show no settling in a freshly opened, full container, no evidence of a separation of solvent, and shall be free from lumps or skins (see 4.6.2).

3.10 Water displacement test. The compounds (1) after storage in contact with water and (2) after 1:1 dilution with paraffin oil, shall satisfactorily displace water (see 4.6.5).

3.11 Fire resistance. The compound, prepared and tested as specified in 4.6.6 may char but shall not support combustion for more than 15 seconds after the flame source is removed.

3.12 Creep. After a seven day test period, the compound shall show evidence of creep of $\frac{1}{8}$ inch but not more than $\frac{1}{2}$ inch between the two test panels (see 4.6.7).

3.13 High temperature flow. The compound shall not flow at a temperature below 175°F (see 4.6.8). Failure shall be considered as any movement of the coating toward the reference line.

3.13.1 Low temperature flexibility. The compound shall not crack, peel, or chip when tested as prescribed 4.7.4.

3.14 Requirements applicable to individual grades.

3.14.1 When tested as specified in 4.7 the compound shall conform to Table II.

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TABLE II
REQUIREMENTS FOR INDIVIDUAL GRADES

	Type Grade 1	Grade 2	Grade 3	Grade 4	Test Para
Salt spray, hours, min	500	300	48	48	4.7.1
Weathering, accelerated hours		600	300		4.7.2
Low temperature stability °F	-20	-20	-20	-20	4.7.3
Salt water immersion, days	14				4.7.5
Film thickness (max, mils dry)	6	3	1.0	3	

3.14.2 Compatibility with insulation materials (Grade 4). When applied as directed by the manufacturer, the compound will not cause damage or swelling of electrical insulation materials commonly used on vehicles.

3.14.3 Salt water immersion (Grade 1). After a minimum of 14 days immersion in a synthetic sea water solution, the coated test panels shall show no evidence of attack by the sea water. After removal of the coating with solvent, not more than three corrosion dots, none of which exceed one millimeter in diameter, shall be evident on any of the test panels. Corrosion on the outer $\frac{1}{4}$ inch of the panel shall not be cause for rejection (see 4.7.5).

3.15 Condition to touch. The compound shall be considered dry to touch when firm pressure with the tip of the finger shows a slight tacky condition without any coating adhering to the finger. There shall be no evidence of rupture of the film (see 4.8).

3.16 Unless otherwise specified, the requirements are for all grades.

4. QUALITY ASSURANCE PROVISIONS

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, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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.

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4.1.1 The supplier shall maintain an effective and economical quality control system which shall control (a) receipt of ingredient material, (b) equipment and procedures for sampling materials, (c) storage of ingredient materials, (d) methods and routes of handling materials, (e) processing procedures and controls and (f) procedures and equipment for conducting the tests prescribed herein.

4.2 Lot. An indefinite quantity of a homogeneous mixture of material of the same type offered for acceptance in a single isolated container; or manufactured by a single plant run (not exceeding 24 hours) through the same processing equipment, with no change in ingredient material.

4.2.1 Packaged lot. An indefinite number of 55 gallon drums or smaller unit packages of identical size and type, offered for acceptance, and filled with a homogeneous mixture of material of the same type manufactured by a single plant run (not exceeding 24 hours) through the same processing equipment, with no change in ingredient material.

4.3 Sampling.

4.3.1 For inspection of material. Unless otherwise specified in the contract or order, a composite sample consisting of not less than two one-gallon containers of the compound shall be taken from each bulk or packaged lot as prescribed in ASTM Method D270-65.

4.3.2 For examination of the preparation for delivery. A random sample of filled containers shall be selected from each packaged lot as prescribed in MIL-STD-105, Inspection Level II, Acceptable Quality Level (AQL) of 2.5 percent defective, and shall be subjected to the examination of 4.4.1.

4.4 Inspection.

4.4.1 Inspection of material. Each composite sample taken as prescribed in 4.3.1 shall be examined for the material requirement; and tested for qualification requirements as prescribed in 4.3.1, or for acceptance requirements as prescribed in 4.5.2, as appropriate.

4.4.2 Examination of the preparation for delivery. Each container selected as prescribed 4.3.2 shall be examined in accordance with MIL-STD-290 for fill, closure, sealing, leakage, packaging, packing, and marking of the shipping container. Each filled container shall also be weighed to determine the amount of contents. Any container having one or more defects, or under the required fill, shall be rejected, and if the number of containers exceeds the acceptance number for the appropriate sampling plan of MIL-STD-105, the lot represented by the sample shall be rejected.

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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 except the salt spray, accelerated weathering, and salt water immersion.

4.6 Tests.

4.6.1 The following test procedures shall conform to the applicable methods as specified in FED-STD-791 or in ASTM and paragraphs 4.6.2 through 4.7.8:

- | | |
|-------------------------|---------------------|
| a. Flash and Fire Point | ASTM Method D92-66 |
| b. Water Content | ASTM Method D95-65 |
| c. Nonvolatile Content | Method 3480 |
| d. Copper Corrosion | ASTM Method D130-65 |
| e. Sulphated Residue | ASTM Method D874-63 |

4.6.2 Condition in container. The condition of the material shall be observed in the container in which the material was submitted for test and prior to any agitation. The presence of lumps or skins shall be noted and a spatula or paddle be lowered into the container to establish evidence of separation or settling.

4.6.3 Film characteristic (Grades 1, 2, 3, and 4). Specimens prepared in accordance with 4.6.5.1 and sprayed to the thickness specified in Table II. shall be examined to determine if the coating is continuous. Upon completion of the accelerated weathering test (Grades 2 and 3 only), specimens that exhibit cracking shall be considered as having failed. Specimens that exhibit checking, alligatoring, or other irregularities shall be considered satisfactory if there is no evidence of etching, pitting, or other evidence of corrosion on the significant areas of the panel as specified in ASTM Method D-1748 upon removal of the compound.

4.6.4 Sprayability and low temperature fluidity. Samples of the compound for testing, held in suitable sealed storage containers, shall be placed in a cold chamber and held at a temperature of $0 \pm 2^\circ\text{F}$ for a period of 24 hours.

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A cup type spray gun 1/ shall be conditioned at $0 \pm 2^\circ\text{F}$ for a minimum of two hours. With all components maintained at the test temperature, the reservoir of the cup gun shall be filled one-half to two-thirds full with the compound under test by pouring from the storage container without previous agitation. With the cup gun reassembled, a determination shall be made of the fluid flow rate from the gun, using a pressure of 40 pounds per square inch, gage (p.s.i.g.), on the fluid container. For this determination the atomizing pressure valve shall be closed and the needle travel regulator adjusted for maximum travel of the gun's trigger. A tared weighing bottle shall be placed in front of the nozzle of the gun in a position to catch the stream of fluid which flows from the gun when the trigger is pulled. After a measured time, the flow rate in grams per second shall be calculated. Following this, the atomizing pressure valve shall be opened, the pattern valve turned completely in, the atomizing pressure to 50 p.s.i.g. maximum, and fluid pressure to a suitable value. The chilled compound shall then be sprayed on a glass plate which is held vertically and approximately 12 inches away from the nozzle of the gun. The film shall be examined for continuity. A material shall be considered sprayable at 0°F if it flows at the rate of 20 grams per second and the film on the sprayed glass panel is continuous and uniform.

1/ The spray gun used in this test is a pressure type manufactured by the DeVebiss Company, Toledo, Ohio, or equal. The gun and component parts are identified as follows:

Gun: MBC51C 765FF

Fluid needle: MBC-444-FF

Air cap: AV 1239 Nr 704

Reservoir: Screwtop type, 1 qt. capacity, KN-519

Fluid nozzle: AV-15-FF inside diameter of orifice 0.055.

4.6.5 Water displacement.

4.6.5.1 Preparation of test panels. Test panels approximately 3 X 6 inches and of any convenient size thickness but in any case not thinner than Nr 24 U.S. Standard Gauge (0.025 inch), with well rounded edges shall be prepared from commercial quality cold rolled steel conforming to Spec QQ-S-698. The surfaces shall be uniformly abraded by sandblasting to a white metal finish. Badly rusted panels shall not be used, and any oil or inorganic residue on the panels shall be removed with hot naphtha and hot ethyl alcohol rinses prior to sandblasting.

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4.6.5.2 After each panel is sandblasted it shall be immediately placed in a container of commercial anhydrous methyl alcohol conforming to Grade A of C-M-232. Just prior to the final cleaning procedure, the methyl alcohol and panels shall be heated so that upon withdrawal of each panel it will be well above the dew point of the room. The panels shall be cleaned by spraying with naphtha, rinsing in hot naphtha and rinsing in hot methyl alcohol. Immediately after cleaning, the panels shall be stored in a calcium chloride desiccator and shall be used the same day as prepared. The panels shall be handled with forceps or other instruments at all times during and after the sandblasting operation to avoid fingerprint corrosion.

4.6.5.3 Preparation of compound. Fifty c.c. of the compound shall be placed in 125 c.c. Erlenmeyer flask, 5 c.c. of distilled water added and the mixture thoroughly shaken. The stoppered flask shall be stored overnight at $130^{\circ} \pm 2^{\circ}\text{F}$ and cooled to $77^{\circ} \pm 2^{\circ}\text{F}$ for testing.

4.6.5.4 Water displacement procedure. Each of three panels, prepared as specified in 4.6.5.1 and 4.6.5.2, shall be dipped in distilled water momentarily and drained in a vertical position for not more than five seconds, with the bottom edge in contact with absorbent paper. The panel shall be immersed horizontally and without agitation for 15 seconds in a petri or evaporating dish containing the compound previously prepared as specified in 4.6.5.3. After draining momentarily, the panel shall be placed in a static humidity cabinet (for example, a desiccator body containing some distilled water) for one hour at $77^{\circ} \pm 2^{\circ}\text{F}$. The compound shall be considered as having passed the water displacement test, if at the end of one hour in test and after removal of the compounds, the panels show no evidence of rusts, mottling, or other abnormal stains or defects.

4.6.5.5 Dilution. The compound shall be diluted 1:1 with paraffin base oil (a neutral non-inhibited petroleum oil of 90-100 S.U.S. viscosity at 100°F) and the water displacement test performed as specified in 4.7.5.4 evaluating the results in a similar manner.

4.6.6 Fire resistance. Three test panels of the size specified in 4.6.5.1 shall be used for this test. A coating of each Grade compound shall be applied to one side of the panel by means of a spray gun to provide the dry-film thickness specified in Table II. The panels shall be permitted to air-dry for seven days at $77^{\circ} \pm 5^{\circ}\text{F}$. One of the panels for each Grade compound shall be suspended vertically in a shielded hood. Place the panel in the flame of a Bunsen Burner with the air shut off and the flame regulated to two inches under the panel so that the lower end of the panel is in the flame one inch. Allow the flame to remain under the test panel for 20 seconds. After the flame is withdrawn observe the time that flaming continues. The tests shall be run in triplicate and the results averaged.

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4.6.7 Creep. Two test panels, of the type specified in 4.6.5.1, shall be cleaned as specified in Method 5329 of FED-STD-791. The panels shall be fastened together with a 3/4 inch overlap by means of a 1/8 inch blind rivet, that is mechanically expanded by a pull stem, centered in the overlap. The compound shall be applied to the top edge of the joint by means of a spatula. The panel shall remain in a vertical position for seven days at $77^{\circ} \pm 5^{\circ}\text{F}$. The panels shall be separated and observed for compliance with 3.12. Care shall be exercised in separating the panels so as not to disturb the compound between the two panels.

4.6.8 High temperature flow test. Three test panels of the type specified in 4.6.5.1 shall be cleaned as specified in 4.6.5.1 and coated and conditioned as in 4.6.6. Using a stiff spatula, knife or razor blade, remove a one 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 four hours in a gravity convection oven maintained at $175 \pm 2^{\circ}\text{F}$. The panel shall be removed from the oven and allowed to cool to $77 \pm 5^{\circ}\text{F}$. The position of the cut edge of the coating relative to the reference line drawn, or scratched on the panel, shall then be observed for compliance with 3.13.

4.6.9 Transparency (Grade 2). On three panels prepared as in 4.6.5.1 fine markings no more than 3/16 inch high shall be scratched with a wall-sharpened scratch-awl. The panels shall be coated as prescribed by the manufacturer and left to dry for 24 hours. At the end of their period the markings shall be legible. These markings may be the panel test numbers or letters.

4.7 Corrosion Protection.

4.7.1 Salt spray resistance.

4.7.1.1 Test panels. Three test panels for the salt spray resistance test shall be prepared as in section 4.6.5.1. The size of the panels shall be 3 by 6 inches.

4.7.1.2 Test procedure. The panels shall be coated and conditioned as specified in 4.6.6. Using a knife, a scribe mark shall be made lengthwise in the middle of the test surface of one of the panels. The back side and edges of all three panels shall be sealed with any appropriate inert material. The panels shall then be exposed for the time specified in Table II in accordance with Method 6061 of FED-STD-141. The salt spray shall be 5 percent NaCl.

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At the completion of the exposure period, the panels shall be rinsed with water, methyl alcohol conforming to O-M-232, naphtha conforming to TT-N-95 and then given a final rinse in methyl alcohol. The panels shall be considered as having passed this test if after removal of the compound no one of the panels shows more than three corrosion dots, none of which exceeds one millimeter in diameter. For the panel with the scribe mark, the compound shall show no signs of undercutting greater than 1/32 inch on either side of the scribe mark. Corrosion on the outer $\frac{1}{4}$ inch of the panel shall not be cause for rejection.

4.7.2 Accelerated weathering (Grades 2 and 3 only). Three panels prepared as specified in 4.6.5.1 for each grade compound shall be sprayed to the thickness specified in Table II and exposed to an accelerated weathering test. The apparatus shall conform to and shall be operated as specified in Method 6151 of FED-STD-141 except the pH of the water shall be 8 ± 1 . The Atlas Model XW Sunshine Arc Weatherometer is acceptable for this test. At the end of the time period specified in Table II, the panels shall be examined for evidence of corrosion as specified in 4.7.1.2.

4.7.3 Low Temperature stability. A pour point tube shall be filled to the mark with the compound and stoppered. The tube shall be transferred to a suitable cold chamber maintained at -20°F and allowed to remain at that temperature for 16 hours. Care shall be taken to avoid physical disturbance of the compound. The sample shall then be removed from the cold chamber and allowed to stand at $77^{\circ} \pm 5^{\circ}\text{F}$ for eight hours. This cycle shall be performed for a total of four times ending with the expiration of the last exposure at -20°F . The tube shall be allowed to stand at $77^{\circ} \pm 5^{\circ}\text{F}$ for six hours after which the tube shall be inverted six times and permitted to stand at $77^{\circ} \pm 5^{\circ}\text{F}$ for one hour. The compound shall show no evidence of separation or settling out at the completion of the storage period.

4.7.4 Low Temperature flexibility. Three panels, 3 X 6 inches, shall be cut from Nr 20 gage, rust free steel conforming to Specification QQ-S-698. The steel shall have a Rockwell "B" hardness between 55 and 65. The panels shall be cleaned as specified in 4.6.5.1. A coating of each Grade compound shall be applied to one side of the panel by means of a spray gun to provide a dry film thickness as specified in Table II. The panels shall then be permitted to air dry for 7 days at $77^{\circ} \pm 5^{\circ}\text{F}$. The panels shall then be conditioned at -10°F for two hours. While at that temperature, the test panels shall be bent quickly for 180 degrees around a preconditioned mandrel 3/16 inch in diameter. Gloves shall be used in handling the panels and no more than five seconds shall elapse from the time the chamber is opened and the panel is bent. The coated flat side of the panel shall then be hammered several times with the ball end of the peen hammer and observed for compliance with 3.13.1.

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4.7.5 Salt water immersion (Grade 1). Three test panels of the same composition and cleaned as specified in 4.6.5.1 shall be coated and conditioned as specified in 4.6.6. Seal the edges and back side of the panel with any appropriate inert material.

4.7.5.1 Preparation of the salt water. The salt water shall be prepared with chemicals conforming to ACS standards for analytical reagent chemicals as follows:

<u>Ingredients</u>	<u>Grams per liter of Solution</u>
Sodium Chloride	27.6
Calcium Chloride	2.4

For the duration of the test, the pH of the solution shall be maintained at a value of 7.8 to 8.2 by addition of five percent solution of sodium carbonate. If the salt water solution is kept in stock it shall be checked, and its pH adjusted to the specified value, prior to each test.

4.7.5.2 Test procedure. The coated and conditioned test panels shall be separately immersed in a vertical position for 14 days in separate tall-form beakers containing salt water to a depth of 3/8 to 5/8 inch above the panels. The panels shall be supported in a vertical position at not less than a 45° angle measured from the horizontal. The beaker shall be covered with a watch glass. The temperature of the salt water during immersion shall be $77^{\circ} \pm 5^{\circ}\text{F}$. Additions of salt water shall be made throughout the test to maintain the proper level of salt water. At the completion of the test the panels shall be removed from the salt water and the coatings examined for evidence of attack. The panels shall then be thoroughly rinsed, in rapid sequence with distilled water, acetone, and naphtha in the order given, and allowed to dry at room temperature and examined immediately using a 15 watt shaded fluorescent light for compliance with 3.14.3.

4.8 Condition to touch. Test panel shall be cleaned as specified in 4.6 5.1 and coated and conditioned as specified 4.6.6. The coating shall then be tested at a point not less than $\frac{1}{2}$ inch from the edge. The test shall be made by applying the fingertip firmly to the compound and observed for compliance with 3.15.

5. PREPARATION FOR DELIVERY

5.1 Packaging. The corrosion preventive compound shall be furnished in one-gallon cans, five-gallon pails or 55-gallon drums as specified (see 6.2). Packaging shall be level A or C as specified (see 6.2).

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5.1.1 Level A.

5.1.1.1 Cans. The one-gallon cans shall conform to Type V, Class 2 of PPP-C-96. Exterior coating shall be Plan B.

5.1.1.2 Pails. The 5-gallon pails shall conform to Type II, Class 1 or 3 of PPP-P-704. Exterior coating of the pails shall be required. Wire handles or bails shall be treated to resist corrosion.

5.1.1.3 Drums. The 55-gallon drums shall conform to Type III or IV as specified (see 6.2) of PPP-D-729. Exterior coating of the drums shall be required. Unless otherwise specified in the contract or order, the coating shall conform to TT-E-485.

5.1.2 Level C. The compound shall be packaged in accordance with manufacturer's commercial practice.

5.2 Packing. Packing shall be Level A, B, or C as specified (see 6.2).

5.2.1 Level A. The compound, packaged in cans in accordance with Level A or C as specified (see 6.2) shall be packed in overseas type wood-cleated fiberboard, nailed wood, wirebound wood (Style 3 for Type 2 load), corrugated or solid fiberboard, wood-cleated paper overlaid or wood-cleated plywood boxes conforming to PPP-B-591, PPP-B-621, PPP-B-585, PPP-B-636, Class 3, PPP-B-576, or PPP-B-601, respectively. Plywood shall be Type II, Class 1 of NN-P-515. Box closures shall be as specified in the applicable box specification or appendix thereto. The gross weight of wood boxes shall not exceed 200 pounds; that of fiberboard boxes shall not exceed the weight limitations of the applicable box specifications. Five gallon and 55-gallon drums will not require packing.

5.2.2 Level B. The compound, packaged in cans in accordance with Level A or C as specified (see 6.2) shall be packed in domestic type wood-cleated plywood or wood-cleated paper overlaid boxes conforming to PPP-B-591, PPP-B-621, PPP-B-585, PPP-B-601, or PPP-B-576, respectively or in overseas type corrugated or solid fiber boxes conforming to Class 2 of PPP-B-636. Closures shall be as specified in the applicable box specification or appendix thereto. Fiberboard boxes shall conform to the special requirements of the applicable box specification. Five gallon and 55-gallon drums will require no packing.

5.2.3 Level C. The compound, packaged in cans in accordance with Level A or C as specified (see 6.2), shall be packed in containers in a manner to insure safe delivery and acceptance at destination. Containers and packing shall comply with the Uniform Freight Classification Rules or other carrier regulations applicable to the mode of transportation. Five gallon and 55-gallon drums will require no packing.

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5.3 Marking. In addition to any special marking specified in the contract or order, each unit and intermediate package and shipping container shall be marked in accordance with MIL-STD-290. Each container shall also be marked as follows:

CAUTION

- a. Containers combustible petroleum thinners of 100°F minimum flash point.
- b. Avoid use near open flames, sparks, or welding or cutting operations.
- c. Avoid prolonged or repeated contact with the skin, or breathing of vapors.
- d. Grade or Type.
- e. Application instructions.

6. NOTES

6.1 Intended use. The corrosion preventive compound covered by this specification is intended for the following uses:

- Grade 1: For protection of vehicles underbody, boxed in and concealed areas.
- Grade 2: For protection of exterior surfaces and inside headliners.
- Grade 3: For protection of exterior of radiators.
- Grade 4: For protection of electrical components.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Grade required (see 1.2).
- c. Type and size of container required (see 5.1).
- d. Level of packaging and packing (see 5.1 and 5.2).
- e. Any special markings.

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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 Warner Robins Air Material Area (WRAMA), Attn: WRNEC, Robins Air Force Base, Georgia 31093, and information pertaining to qualification of products may be obtained from that activity.

6.4 Unit of purchase. The unit of purchase is the U.S. gallon of 231 cubic inches at 15.6°C (60°F).

Custodians:

Army - MR
Air Force - 84
Navy - YD

Preparing activity:

Air Force - 84
Project Nr 8030-0314
Code "N"

Review Activity:

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