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SUPERSEDING
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FEDERAL SPECIFICATION

PRIMER COATING, ALKYD, WOOD AND FERROUS METAL

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers a combination air-drying and baking, oil-modified alkyd resin primer for ferrous metal and wood. It provides two compositions, one of which is suitable for use under AIR POLLUTION REGULATIONS (see 6.7).

1.2 Classification. Primer covered by this specification shall be of the following composition as specified.

Composition G - General use.
Composition L - Limited use (see 6.7).

2. APPLICABLE DOCUMENTS

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

Federal Specifications:

TT-E-489 - Enamel; Alkyd Gloss (For Exterior and Interior Surfaces).
TT-P-143 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing, and Marking Of.
TT-S-735 - Standard Test Fluids; Hydrocarbon.
TT-T-291 - Thinner; Paint, Volatile Spirits (Petroleum-Spirits).

Federal Standard:

Fed. Test Method Std. No. 141 - Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling, and Testing.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

(Single copies of this specification and other Federal Specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Service Administration Regional Offices in Boston, New York, Washington, D. C., Atlanta, Chicago, Kansas City, Mo., Fort Worth, Denver, San Francisco, Los Angeles and Seattle, Washington.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specification and Standards from the established distribution points in their agencies.)

3. REQUIREMENTS

3.1 Qualification. Primer furnished under this specification shall be a product which is qualified for listing on the applicable Qualified Products List at the time set for opening of bids (see 4.2 and 6.3). Any change in the formulation of a qualified product will necessitate its requalification. The material supplied under the contract shall be identical within manufacturing tolerances, to the product receiving qualification.

3.2 Color. The color of the primer shall be characteristic of red or brown iron oxide pigments.

3.3 Composition.

3.3.1 Pigment. The pigment portion of the primer shall conform to the percent by weight requirements of Table I when tested as in 4.3.2.

TABLE I. Quantitative requirements of pigment

Characteristics	Requirements	
	Minimum	Maximum
iron oxide (Fe_2O_3)	50	--
Zinc yellow (CrO_3 x 2.4)	10	--
Zinc oxide	10	15
Siliceous extenders	--	30
Sum of the percentages of iron oxide (Fe_2O_3), zinc yellow (CrO_3 x 2.4), zinc oxide, and acid insoluble siliceous material	90	--

3.3.2 Vehicle.

3.3.2.1 Composition G - General use. The vehicle shall be a phthalic alkyd resin made from prime vegetable oils. The resin shall contain not less than 30 percent phthalic anhydride, shall be no darker than 12 (Gardner Color Standards 1953) at 50 percent solids in mineral spirits, and shall contain no rosin, phenol, or other resin modification. The necessary amounts of suitable aliphatic and/or aromatic solvents and driers shall be added to yield a product conforming to the requirements of this specification. Small amounts of anti-skinning agents, wetting agents, suspension agents, and anti-drier adsorption agents may be added at the discretion of the manufacturer.

3.3.2.2 Composition L - Limited use. The vehicle shall be the same as in 3.3.2.1 except that the thinner used shall conform to the following requirements by volume when tested as in 4.3.3.

a. Aromatic compounds with eight or more carbon atoms except ethylbenzene: 8 percent maximum.
b. Ethylbenzene and toluene: 20 percent maximum.
c. Solvents with an olefinic or cyclo-olefinic type of unsaturation: negative test (see 6.8).
d. Ketones: negative.
e. Total of a + b: 20 percent maximum.

3.4 Quantitative requirements. The primer shall conform to the quantitative requirements of Table II when tested as in 4.3.

TABLE II. Quantitative requirements of primer

Characteristics	Minimum	Maximum
Total solids, percent by weight of primer	64	--
Pigment, percent by weight of primer	40	45
Vehicle solids, percent by weight of primer	22	--
Pigment volume, percent of total soids volume	--	37
Phthalic anhydride, percent by weight of nonvolatile vehicle	30	--
Oil acids, percent by weight of nonvolatile vehicle	48	--
Unsaponifiable matter, percent by weight of nonvolatile vehicle	--	1.0
Rosin, on isolated vehicle	Negative	
Phenolic resin, on isolated vehicle	Negative	
Water, percent by weight of paint	--	1.0
Coarse particles and skins (retained on No. 325 sieve), percent by weight of pigment	--	1.0
Viscosity (package):		
Krebs-Stormer, Shearing rate, 200 r.p.m.:		
Grams	125	175
Equivalent K. U.	67	77
Viscosity (reduced), No. 4 Ford Cup, seconds	17	25
Drying time:		
Air-drying:		
Set to touch, minutes	15	60
Dry through, hours	--	18
Full hardness, hours	--	72
Baking:		
Dry to handle at 250°F.1/ or equivalent heat treatment, minutes	--	45
60-degree specular gloss	5	30
Fineness of grind	5	--

1/ A baking temperature recommended by the manufacturer may be substituted for the 250°F. temperature specified.

3.5 Qualitative requirements.

3.5.1 Condition in container. A freshly opened full container of primer, when tested as in 4.3.7 shall be free from grit, seeds, skins, lumps, abnormal thickening, or livering and shall show no more pigment settling or caking than can be readily reincorporated to smooth homogeneous state.

3.5.2 Storage stability.

3.5.2.1 Partially full container. A three-quarter filled, closed 8-ounce glass jar of primer shall show no skinning when tested as in 4.3.8.1. After aging as in 4.3.8.1, the primer shall show no livering, curdling, seeding, hard caking, or gummy sediment. It shall mix readily to a smooth homogeneous state and any skin formed shall be continuous and easily removed.

3.5.2.2 Full container. A full quart container of primer shall show no skinning, livering, curdling, seeding, hard, dry caking nor tough, gummy sediment when tested as in 4.3.8.2. The primer shall remix readily to a smooth homogeneous state, shall have a maximum viscosity of 87 K. U. and shall meet all other requirements of the specification.

3.5.3 Dilution stability. When thinned as in 4.3.9, the primer shall remain stable and uniform showing no precipitation, curdling, or separation. Slight pigment settling shall be permitted.

3.5.4 Brushing properties. The primer tested as in 4.3.10 shall be capable of being brushed out and laid off without dragging the brush. When dry, the brushed surface shall be free from sags and runs, and shall show a minimum of brush marks.

3.5.5 Spraying properties. The primer tested as in 4.3.11 shall spray satisfactorily in all respects, and show no running, sagging, or streaking. The dried film shall show no dusting, mottling, or color separation, and shall present a smooth, lustreless finish free from seediness.

3.5.6 Flexibility. A film of primer tested as in 4.3.12 shall withstand bending without cracking or flaking.

3.5.7 Knife test. A film of primer tested as in 4.3.13 shall be hard and tough and shall adhere tightly to the metal. It shall be difficult to furrow off with the knife and shall not flake, chip, or powder. The knife cut shall show beveled edges.

3.5.8 Recoating. A film of primer tested as in 4.3.14 shall show no blistering, wrinkling, or other evidence of lifting. The systems shall have a gloss of not less than 90 percent of the gloss of the olive drab enamel applied over glass and shall show satisfactory adhesion between enamel and primer and between primer and glass.

3.5.9 Water resistance. A film of primer tested as in 4.3.15 shall show no wrinkling or blistering immediately after removal of the panel from water. The primer shall be no more than slightly affected when examined 2 hours after removal. After 24 hours air drying, the portion of the panel which was immersed shall be almost indistinguishable with regard to hardness, adhesion and general appearance from panel prepared at the same time but not immersed.

3.5.10 Hydrocarbon resistance. A film of primer tested as in 4.3.16 shall show no blistering or wrinkling immediately after removal of the panel. After 24 hours air drying, the portion of the panel which was immersed shall be almost indistinguishable with regard to hardness, adhesion, and general appearance from a panel prepared at the same time but not immersed.

3.5.11 Salt spray resistance. A film of primer tested as in 4.3.17 and examined immediately after removal from the salt spray test shall show no more than a trace of rusting (No. 9-1, Method 6451 of Fed. Test Method Std. No. 141), and no more than five scattered blisters no larger than 1 mm. in diameter. On removal of the primer there shall be no more than a trace of rusting, pitting, or corrosion of the steel.

3.5.12 Weather resistance. Films of primer exposed as in 4.3.18 shall show no rusting, cracking, checking, flaking, or loss of adhesion. On removal of primer the surface of the metal shall show no more than a trace of rusting, pitting, or corrosion (No. 9-1, Method 6451 of Fed. Test Method Std. No. 141).

3.5.13 Toxicity. The product shall contain no benzene (benzol), chlorinated compounds, or hydrolyzable chlorine derivatives.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsiblity 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 that supplies and services conform to prescribed requirements.

4.1.1 Sampling and inspection. Sampling and inspection shall be performed in accordance with Method 1031 of Fed. Test Method Std. No. 141.

4.2 Classification of tests. Testing under this specification shall be for the following:

(a) Qualification.
(b) Acceptance of individual lots.
(c) Acceptance for use as component on end item.

4.2.1 Qualification tests. The qualification tests shall consist of tests for all requirements specified in section 3 (see 6.3).

4.2.2 Acceptance tests. Acceptance tests for acceptance of individual lots shall consist of tests specified in section 4 with the exception of storage stability (see 3.5.2.2 and 4.3.8.2) and weather resistance (see 3.5.12 and 4.3.18).

4.2.3 When approved by the cognizant activity, acceptance of lots for use as component on an end item shall be based on conformance with specified requirements for the following characteristics:

Phthalic anhydride
Drying oil acids
Zinc chromate
Zinc oxide
Iron oxide
Flexibility
Knife test
Water resistance
Hydrocarbon fluid resistance
Total solids
Pigment, percent by weight of primer
Vehicle solids, percent by weight of primer

4.3 Test methods.

4.3.1 Test conditions. The routine and referee testing conditions shall be in accordance with section 7 of Fed. Test Method Std. No. 141 except as otherwise specified herein.

4.3.2 The following tests shall be conducted in accordance with Fed. Test Method Std. No. 141, and as hereinafter specified.

TABLE III. Index

Item	Test Method: Applicable method in Fed. Test Method Std. No. 141	Test Method: Paragraph of this specification giving further references	Paragraph of this specification giving requirements
Analysis of pigment	7331	--	Table I, II
Aromatic compounds	--	4.3.3.2	3.3.2.2
Olefinic and cyclo-olefinic	--	4.3.3.3	3.3.2.2
Ketones	--	4.3.3.4	3.3.2.2
Total solids	4041	--	Table II
Pigment content	4022	--	Table II
Vehicle solids	4052	--	Table II
Pigment volume	4312	--	Table II
Phthalic anhydride	7014	--	Table II
Oil acids	7014	--	Table II
Unsaponifiable	7014	--	Table II
Rosin	5031	--	Table II
Phenolic resins	5141	--	Table II
Water	4082	--	Table II
Coarse particles and skins	4092	--	Table II
Viscosity:			
Package	4281	--	Table II
Reduced	4282	4.3.4	Table II
Specular gloss	6101	4.3.5	Table II
Fineness of grind	4411	--	Table II
Drying time	4061	4.3.6	Table II
Full hardness	4061	4.3.6.1	Table II
Condition in container	3011	4.3.7	3.5.1
Storage stability:	--	4.3.8	3.5.2
Partially full container	3021	4.3.8.1	3.5.2.1
Full container	3022	4.3.8.2	3.5.2.2
Dilution stability	4203	4.3.9	3.5.3
Brushing properties	4321	4.3.10	3.5.4
Spraying properties	4331	4.3.11	3.5.5
Flexibility	6221	4.3.12	3.5.6
Knife test	6304	4.3.13	3.5.7
Recoating	--	4.3.14	3.5.8
Water resistance	6011	4.3.15	3.5.9
Hydrocarbon resistance	6011	4.3.16	3.5.10
Salt spray resistance	6061	4.3.17	3.5.11
Weather resistance	6161	4.3.18	3.5.12
Toxicity	--	4.3.19	3.5.13

4.3.3 Solvent analysis for composition L.

4.3.3.1 Separation of volatile portion. Pour about 15 grams of the primer into a 50 ml. distilling flask. Add 10 ml. of tricresyl phosphate and several anti-bumping stones or Berl saddles. Fit a release valve into the mouth of the flask and attach a delivery tube to the side arm, extending into a receiver. The receiver consists of a test tube (20 x 150 mm.) with side arm for attaching to a vacuum pump. The glass delivery tube should reach 1-1/2 inches from the bottom of the tube. Immerse the receiver in a dry ice-acetone bath. Preheat a silicone oil bath to 180°C. Raise the oil bath until the oil reaches the sample level. Reduce the pressure slowly to 10 mm. of mercury. After all solvent has distilled, carefully release the vacuum using the valve that is connected to the distilling flask. Reserve the collected distillate for the aromatic solvent determination and the test for ketone, olefinic, and cyclo-olefinic compounds.

4.3.3.2 Determination of aromatic hydrocarbons.

Apparatus: A gas chromatograph equipped with a thermal conductivity detector.

Column Preparation: Two lengths of 1/4-inch copper tubing, 6-ft. and 18-ft. long, are packed with 35 percent N,N-Bis(2-cyanoethyl) formamide on 60- to 80-mesh Chromosorb P.

Operating Conditions:	6-ft.	18-ft.
Detector cell temperature, °C.	300	300
Detector cell current, ma.	150	150
Injection port temperature, °C.	300	300
Helium flow at exit, cc/minute	175	110
Column temperature, °C.	125	70

4.3.3.2.1 Aromatic and oxygenated solvents - procedure A. Install the 6-ft. column and follow the operating conditions described above. Inject about 3 microliters of the isolated distillate and scan the chromatogram. The aliphatic solvents will emerge within 1 minute and the complete chromatogram should develop in about 5 minutes. From the position of the peaks observed on the chromatogram, select an internal standard that will be free of interference, such as cyclopentanol or cyclohexanol. Add 0.6 ml. of internal standard to 3 ml. of the distillate, analyze according to the above procedure. Peaks emerging after 1 minute are aromatic solvents along with any oxygenated solvents that may be present. Calculate the percent of aromatic and oxygenated solvents as follows:

$$\% \text{ aromatic and oxygenated solvents, v/v} = \frac{20^{*} \times A}{1.02^{**} \times B}$$

where, A = area of aromatic and oxygenated solvent
B = area of internal standard
* is percent of internal standard added
** is correction factor if cyclopentanol is used. If another internal standard is used, calibrate to determine the correction factor.

NOTE: If the above determination exceeds 8 percent, continue with the following procedure:

4.3.3.2.2 Total aromatic content - procedure B. Place 5 ml. of the distillate in a 10-ml. glass stoppered graduate. Add 5 ml. of 85 percent sulfuric acid slowly while the graduate is being cooled with tap water. After the acid has been added, shake vigorously for 2 minutes then allow the layers to separate. Remove as much of the top layer as possible and wash with distilled water. Carefully pipet 3 ml. of the washed solvent into a small flask followed by 0.6 ml. of the internal standard. Mix and analyze according to procedure A. Calculate the percent of aromatics after acid treatment in the same manner as in procedure A and the percent of total aromatic solvents as follows:

$$\% \text{ total aromatic solvents, v/v} = \frac{B \times (100 - A)}{100 - B}$$

where, A = percent of aromatic and oxygenated solvents from procedure A
B = percent of aromatic solvents after acid treatment

NOTE: If the total aromatic content of the solvent is between 8 percent and 20 percent, continue with the following procedure:

4.3.3.2.3 Toluene and ethylbenzene - procedure C. Install the 18-ft. column and follow the operating conditions described for that column. Add 0.3 ml. of high purity benzene to the 3 ml. sample used in procedure A. If the results of procedures A and B indicated the presence of oxygenated solvents, treat this sample with 85 percent sulfuric acid (use 3 ml. acid) as described in procedure B. Inject about 3 microliters of sample and allow the chromatogram to develop until all of the xylene isomers appear. Purge the column by raising the column temperature to 120°C. After the high boiling materials emerge, reset the column temperature to 70°C. Calculate the percent of toluene and ethylbenzene as follows:

$$\% \text{ toluene, v/v} = \frac{(\text{area of toluene peak})(1.017)^{*}\ (10)^{**}}{(\text{area of benzene peak})}$$

$$\% \text{ ethylbenzene, v/v} = \frac{(\text{area of ethylbenzene peak})(1.054)^{*}\ (10)^{**}}{(\text{area of benzene peak})}$$

where, * is the correction factor for the detector response
** is the percentage of internal standard added

NOTE: Sensitivity of the instrument should be adjusted to keep peaks from running off the scale. Appropriate corrections must be made for changes in sensitivity when computing the peak areas.

4.3.3.3 Test for olefinic or cyclo-olefinic compounds. Take 2 test tubes and place 2 drops of the distillate in each. Dissolve the first sample in 1 ml. of carbon tetrachloride and add 1 drop of 1 percent bromine in carbon tetrachloride. Shake and allow to set for 5 minutes. A positive test is indicated by the complete absence of yellow color when observed against a white background. Dissolve the second sample in 1 ml. of acetone and add 1 drop of 1 percent permanganate solution (1 gram of potassium permanganate crystals in 95 mls. of acetone and 5 mls. of water). Shake and allow to set for 2 minutes. A positive test is indicated by the decolorization of the purple solution. The solvent is considered to fail the test for olefinic and cyclo-olefinic compounds if either of the above tests is positive (see 3.3.2.2 and 6.8).

4.3.3.4 Test for ketones.

4.3.3.4.1 Reagent. Two grams of 2,4-dinitrophenylhydrazine + 4 mls. of concentrated sulfuric acid + 30 mls. methanol (add slowly) + 10 mls. water.

4.3.3.4.2 Procedure. Pipette 1 ml. of reagent into a 20 x 170 mm. test tube. Add 10 drops of distillate and shake for 30 seconds. A yellow precipitate or cloud in the reagent layer indicates the presence of ketones. Run a blank using one milliliter of reagent and 10 drops of mineral spirits.

4.3.4 Viscosity (reduced). Reduce 5 parts by volume of primer with one part by volume of thinner conforming to TT-T-291, grade 1 except that thinner used with composition L shall have a maximum of 8 percent aromatic content and test as specified in method 4282 of Fed. Test Method Std. No. 141. Check for compliance with Table II.

4.3.5 Specular gloss. Draw down the primer as packaged, using a 0.0015-inch (0.0030 inch gap clearance) film applicator. Test as specified in method 6101 of Fed. Test Method Std. No. 141 for compliance with Table II.

4.3.6 Drying time. Determine drying time as in method 4061 of Fed. Test Method Std. No. 141 under referee conditions, except that the primer shall be drawn down with a 0.002 inch (0.004 inch gap clearance) film applicator.

4.3.6.1 Full hardness. The film shall be considered to have reached full hardness when it is very difficult to remove with a knife blade.

4.3.7 Condition in container. Determine package condition on acceptance testing in accordance with method 3011 of Fed. Test Method Std. No. 141 and observe for compliance with 3.5.1. On qualification testing evaluate pigment settling or caking by proceeding as in method 3011 but do not stir. Reseal and then agitate the can for 3 minutes on a paint shaker[1/]. On re-examination of the contents, the disclosure of any gel bodies, or undispersed pigment indicates unsatisfactory settling properties.

4.3.8 Storage stability.

4.3.8.1 Partially full container. Determine skinning after 48 hours in accordance with method 3021 of Fed. Test Method Std. No. 141. Reseal and age for 7 days at 60°C. and observe for compliance with 3.5.2.1.

4.3.8.2 Full container. In accordance with method 3022 of Fed. Test Method Std. No. 141 allow a full standard quart can of the primer to stand undisturbed for 6 months and then examine the contents. Evaluate pigment settling or caking as in 4.3.7 but agitate the can for 5 minutes on the paint shaker prior to re-examination. Determine viscosity and make other applicable tests to determine compliance with 3.5.2.2.

4.3.9 Dilution stability. Reduce five parts by volume of primer as packaged with one part by volume of mineral spirits conforming to grade 1 of TT-T-291, except that thinner used with composition L shall have a maximum of 8 percent aromatic content. Then test according to method 4203 of Fed. Test Method Std. No. 141 for compliance with 3.5.3.

[1/] An apparatus of this type, powered by a 1/4 hp. motor, operates at a rate of 1350 shakes per minute and is manufactured by Red Devil Tools, Irvington, New Jersey.

4.3.10 Brushing properties. Apply the primer as packaged using a 2-1/2 inch brush in accordance with method 4321 of Fed. Test Method Std. No. 141 and observe for compliance with 3.5.4.

4.3.11 Spraying properties. Reduce five parts by volume of primer with one part by volume of thinner conforming to TT-T-291 grade 1, except that thinner used with composition L shall have a maximum of 8 percent aromatic content. Spray on a steel panel and observe for spraying properties in accordance with method 4331 of Fed. Test Method Std. No. 141 for compliance with 3.5.5. For referee test use automatic application per method 2131 of Fed. Test Method Std. No. 141.

4.3.12 Flexibility. Determine flexibility in accordance with method 6221 of Fed. Test Method Std. No. 141. Apply a 2-inch wide film of primer with a film applicator that will give a dry film thickness of 0.0009 to 0.0011 inch on a smooth finish steel panel prepared in accordance with method 2011 of Fed. Test Method Std. No. 141 using the aliphatic naphtha ethylene glycol monoethyl ether mixture. The panel shall be prepared from new cold rolled carbon steel rust-free 0.010 + 0.001 inch thick with a Rockwell 15-T maximum hardness of 82 and finished with a surface roughness of 8 to 12 microinches. Air-dry the primer in a horizontal position for 18 hours and then bake for 168 hours at 105° + 2°C. (221° + 4°F.). Condition the panel for 1/2 hour under referee conditions. Bend over a 1/4 inch mandrel. Examine the coating for cracks over the area of the bend in a strong light at a 7-diameter magnification for compliance with 3.5.6.

4.3.13 Knife test. Perform the knife test on the flat portion of the flexibility test panel (4.3.12) in accordance with method 6304 of Fed. Test Method Std. No. 141, and observe the results for compliance with 3.5.7.

4.3.14 Recoating. Using a 0.0015-inch (0.0030-inch gap clearance) film applicator, draw down a 2 inch wide film of the primer on a clear plate glass panel. Air dry for 24 hours, then apply a 3 inch wide film of olive drab gloss enamel conforming to TT-E-489, class A, across the width of the dried primer film with a 0.0030-inch (0.0060-inch gap clearance) film applicator. After the enamel has dried 24 hours compare the 60 degree specular gloss of the enamel over the primer with that of the enamel on glass and check for compliance with 3.5.8. Allow the specimens to air dry for 72 hours after recoating and determine the adhesion between enamel and primer and between primer and glass using the knife test as in method 6304 of Fed. Test Method Std. No. 141, observe for compliance with 3.5.8.

4.3.15 Water resistance. Draw down a film of the primer with a 0.0020-inch (0.0040-inch gap clearance) film applicator on a tin panel prepared in accordance with method 2012 of Fed. Test Method Std. No. 141 using the aliphatic naptha-ethylene glycol monoethyl ether mixture. Air dry the primer for 96 hours. Then immerse in distilled water at 23° + 1°C. for 18 hours in accordance with method 6011 of Fed. Test Method Std. No. 141. At the end of the test period remove and examine for compliance with 3.5.9.

4.3.16 Hydrocarbon resistance. Prepare a film of the primer as in 4.3.15 and air dry 96 hours. Do not wax or coat the exposed metal surfaces. Immerse the panel for 4 hours in a hydrocarbon fluid conforming to TT-S-735, type III, in accordance with method 6011 of Fed. Test Method Std. No. 141. At the end of the test period remove and examine for compliance with 3.5.10.

4.3.17 Salt spray resistance. Prepare three 4- x 12-inch steel panels by sanding with 6/0-220 silicon carbide paper and solvent cleaning in accordance with method 2011 of Fed. Test Method Std. No. 141 using the petroleum naphtha-ethylene glycol monoethyl ether mixture. Reduce the primer for spray application as in 4.3.11 and spray the test panels to a dry film thickness between 0.0009 and 0.0011 inches. Air dry for 96 hours. Do not score. Expose the unscored panels to 5 percent salt spray for 144 hours as described in method 6061 of Fed. Test Method Std. No. 141. Upon removal, wash the panels gently in running water not warmer than 100°F. until free from any visible salt deposits and examine immediately for compliance with the requirements of 3.5.11. Strip the primer film from the panels by means of lacquer thinner and inspect steel for rusting, pitting, or corrosion.

4.3.18 Weather resistance. Phosphate clean two 4- by 12-inch steel panels as specified in 2011 method B of Fed. Test Method Std. No. 141. Spray two coats of the primer at 0.0009 to 0.0011 inch dry film thickness per coat. Air dry the first coat for 18 hours in a horizontal postition before applying the second coat. Permit the test panels to air dry 96 hours and then expose in accordance with method 6161 of Fed. Test Method Std. No. 141 for 18 months in the latitude of Washington, D. C. Examine the panels for compliance with 3.5.12. Strip the panels to bare metal and inspect the surface of the metal for compliance with 3.5.12.

4.3.19 Toxicity. The manufacturer shall certify that the primer contains no benzene (benzol), chlorinated compounds, or hydrolyzable chlorine derivatives.

4.3.20 Packaging, packing and marking. The primer coating shall be inspected to determine conformance to the requirements of section 5.

5. PREPARATION FOR DELIVERY

5.1 Packaging, packing, and marking. The primer coating shall be packaged, packed, and marked in accordance with TT-P-143. The level of packaging shall be level A or C and the level of packing shall be level A, B, or C, as specified (see 6.2). The primer coating shall be furnished in 1-quart or 1-gallon multiple friction top containers, in 5-gallon lug cover steel pails or in 55-gallon steel drums as specified (see 6.2).

6. NOTES

6.1 Intended use. The primer covered by this specification is intended for priming the clean, rust-free, bare or phosphate-treated ferrous metal parts of vehicles, guns, gun mounts, tanks, metal shipping containers, and similar ordnance material. It may also be used as a sealing undercoat on the wood parts of motor vehicles. It is not intended for use on the inside of potable water tanks, for marine use, for steel exposed to severe acid or sulfur fumes or steel structures exposed to long term weathering. It is not intended for use as a lacquer resistant primer; TT-P-664 is recommended for this application.

6.2 Ordering data. Purchasers should exercise any desired options offered herein and procurement documents should specify the following:

(a) Title, number, and date of this specification.
(b) Composition required (see 1.2).
(c) Level of packaging and level of packing required (see section 5).
(d) Size of container required (see section 5).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, 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 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 the US Army Aberdeen Research and Development Center, Coating and Chemical Laboratory, Aberdeen Proving Ground, Maryland 21005 and information pertaining to qualification of products may be obtained from that activity.

6.4 The primer covered by this specification should be purchased by volume, the unit being one U.S. gallon of 231 cubic inches at 68°F. (20°C.).

6.5 The pigmentation contemplated in Table I is 50 percent iron oxide (actual Fe_2O_3), 10 percent zinc yellow, 10 percent zinc oxide, and 30 percent siliceous extender. A good grade of natural iron oxide may be used, such as one conforming to either TT-P-405 or TT-P-408. However, a combination of synthetic iron oxide (for example, conforming to TT-P-375) and a low oil absorption extender (magnesium silicate, for example) may be used.

6.6 It is believed that this specification adequately describes the characteristics necessary to secure the desired material and that normally no samples will be necessary prior to award to determine compliance with this specification. If, for any particular purpose, samples with bids are necessary, they should be specifically asked for in the invitation for bids, and the particular purpose to be served by the bid sample should be definitely stated; the specification to apply in all other respects.

6.7 Composition L primer should be specified for use in areas with regulations controlling the emission of solvents into the atmosphere.

6.8 The test for olefinic and cyclo-olefinic compounds will not be positive for solvents containing less than 1 percent of these compounds.

MILITARY CUSTODIANS:
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