NOT MEASUREMENT SENSITIVE

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SUPERSEDING
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MILITARY SPECIFICATION

PRIMER, ALKYD, FAST DRY, CORROSION INHIBITING, LEAD AND CHROMATE FREE, VOC COMPLIANT

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

1. SCOPE

1.1 Scope. This specification covers the requirements of a fast drying, corrosion inhibiting, low VOC content alkyd primer for metal surfaces. This primer is lead and chromate free and contains no more than 420 grams per liter (3.5 pounds per gallon) of VOCs as applied. This primer is not to be used on tactical or combat equipment, or equipment that will be exposed to any nuclear, biological, or chemical (NBC) agents and decontamination procedures. Equipment primed with this material is not to be coated with CARC primers or topcoats.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards handbooks. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: USA Belvoir Research, Development, and Engineering Center, ATTN: SATBE-TSE, Fort Belvoir, VA 22060-5606 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 8010

SPECIFICATIONS

FEDERAL

TT-T-306 - Thinner, Synthetic Resin, Enamel.
PPP-P-1892 - Paint, Varnish, Lacquer and Related Materials; Packaging, Packing and Marking of.
PPP-T-60 - Tape, Packaging, Waterproof.

STANDARDS

FEDERAL

FED-STD-141 - Paint, Varnish, Lacquer and Related Materials: Methods of Inspection, Sampling and Testing.
FED-STD-313 - Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

B 117 - Salt Spray (Fog) Testing.
D 50 - Chemical Analysis of Yellow, Orange, Red and Brown Pigments containing Iron and Manganese.
D 185 - Coarse Particles in Pigments, Pastes and Paints.
D 523 - Specular Gloss.
D 562 - Consistency of Paints using the Stormer Viscosimeter.
D 610 - Evaluating Degree of Rusting on Painted Steel Surfaces.
D 1210 - Fineness of Dispersion of Pigment Vehicle Systems.
D 1364 - Water in Volatile Solvents (Fischer Reagent Titration Method).
D 1640 - Drying, Curing, or Film Formation of Organic Coatings at Room Temperature.
D 1729 - Visual Evaluation of Color Differences of Opaque Materials.
D 2369 - Volatile Content of Coatings.
D 2371 - Pigment Content of Solvent Reducible Paints.
D 3271 - Direct Injection of Solvent-Reducible Paints into a Gas Chromatograph for Solvent Analysis.
D 3335 - Low Concentration of Lead, Cadmium and Cobalt in Paint by Atomic Absorption Spectroscopy.
D 3960 - Determining Volatile Organic Content (VOC) of Paints and Related Coatings.

(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 that prepare or 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 document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. The coatings furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable Qualified Products List at the time set for opening of bids (see 4.2.1.1 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 tolerance, to the product receiving qualification.

3.2 Materials. The materials used in the coating shall be as specified herein. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

3.2.1 Toxic products and formulations. The material shall have no adverse effect on the health of the personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the contracting activity to the appropriate departmental medical service which will act as an advisor to the contracting agency.

3.2.2 Material Safety Data Sheet. A Material Safety Data Sheet (MSDS) shall be prepared in accordance with FED-STD-313 and forwarded to the qualifying activity (see 6.3). MSDS shall be included with each shipment of the material covered by this specification and submitted to pertinent Government agencies as stated in FED-STD-313, appendix B.

3.2.3 Prohibited material. The product shall not contain benzene, chlorinated solvents or ethylene based glycol ethers and their acetates. The lead content shall not exceed 0.06 percent of the nonvolatile content. Chromium (hexavalent) compounds shall not be used (see 3.4.1).

3.3 Color. When tested as specified in 4.3.4, the color of the primer shall be characteristic of the iron oxide red pigment.

3.4 Composition.

3.4.1 Pigment. The pigment portion of the primer shall conform to the requirements of table I when tested as specified in 4.3.5, 4.3.6, and 4.3.7.

TABLE I. Quantitative requirements of pigment.

PIGMENT	PERCENT BY WEIGHT	
	MINIMUM	MAXIMUM
Iron oxide, red, color index - PR101	30.0	-
Zinc phosphate	9.0	11.0
Corrosion inhibiting pigment 1/	0.9	1.1
Siliceous extenders	-	60.0
Barium sulfate	-	10.0
Hexavalent chromium	Neg	Neg

1/ Sicorin Rz, BASF Wyandotte Corporation, or equivalent.

3.4.2 Vehicle. The vehicle shall be a drying oil alkyd resin, modified or unmodified.

3.4.3 Solvent analysis. Solvents used shall meet the requirements of 3.2.3 when tested as specified in 4.3.9.

3.5 Quantitative requirements. The primer shall conform to the quantitative requirements of table II when tested as specified in 4.3.2.

TABLE II. Quantitative requirements of primer.

CHARACTERISTICS	REQUIREMENTS	
	MINIMUM	MAXIMUM
VOC, grams volatile per liter of primer reduced for spray	-	420
Total solids, % by weight of primer	70.0	-
Total pigment, % by weight of non-volatile	-	70.0
Lead metal, % by weight of total solids	-	0.06
Water, % by weight of primer	-	0.5
Coarse particles and skins, % by weight of pigment	-	0.5
Specular gloss, 60 degree	2	6
Viscosity, reduced as specified in 4.3.11, KU	-	70
Fineness of grind	5	-
Drying time, air dry		
Set to touch, minutes	-	5
Dry hard, minutes	-	12

3.6 Qualitative requirements.

3.6.1 Condition in container. A freshly opened full container of the primer shall be free from grit, coarse particles, skins, lumps, seeds, livering or abnormal thickening when tested as specified in 4.3.13. The primer shall show no pigment settling or caking that can not be readily reincorporated to a smooth homogeneous state.

3.6.2 Storage stability.

3.6.2.1 Full container. A full quart of the primer shall be free from coarse particles, grit, skins, lumps, seeds, livering, hard caking and tough, gummy sediment when tested as specified in 4.3.14.1. The primer shall remix readily to a smooth homogeneous state, shall show a maximum viscosity increase of 15KU and shall meet all the requirements of this specification.

3.6.2.2 Partially filled container. The primer shall show no skinning when tested as specified in 4.3.14.2. After being aged as specified in 4.3.14.2, the primer shall show no livering, curdling, seeding, hard caking, or tough gummy sediment.

3.6.3 Accelerated stability. The primer shall show no livering, curdling, hard caking, or tough gummy sediment when tested as specified in 4.3.15 and shall mix readily to a smooth, homogeneous state.

3.6.4 Suspension properties. The primer shall completely redisperse to a smooth, homogeneous state when tested as specified in 4.3.16.

3.6.5 Spraying properties. The primer shall show no running, sagging or streaking when tested as specified in 4.3.17. The dried film shall show no dusting, mottling, color separation, flooding or floating, and shall present a smooth, uniform finish free from defects.

3.6.6 Flexibility. A film of the primer shall withstand bending without cracking or flaking when tested as specified in 4.3.18.

3.6.7 Knife test. The primer shall adhere tightly to and not flake or crack from the metal surface when tested as specified in 4.3.19. The film shall ribbon or curl from the metal on cutting and the cut shall show beveled edges.

3.6.8 Water resistance. The primer, when tested as specified in 4.3.20, shall show no wrinkling or blistering over the whole panel when examined immediately after removal from distilled water. When examined two hours after removal, there shall be only a slight softening, whitening or dulling. After 24 hours air drying, 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.

3.6.9 Hydrocarbon resistance. The primer, when tested as specified in 4.3.21, shall show no wrinkling or blistering over the whole panel when examined immediately after removal from the hydrocarbon solution. When examined two hours after removal, there shall be only a slight softening, whitening or dulling. After 24 hours air drying, 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.

3.6.10 Adhesion. Films of the primer tested as specified in 4.3.22 shall show no removal of the primer by the adhesive tape beyond one-eighth inch on either side of the score line.

3.6.11 Salt spray resistance. Films of the primer tested as specified in 4.3.23 and examined immediately after removal from the salt spray test shall show no more than a trace of rusting (No. 9, ASTM D 610) and no more than five scattered blisters, none larger than 1 mm in diameter. On removal of the primer, there shall be no more than a trace of rusting, pitting, or corrosion on the panels.

3.6.12 Weather resistance. Films of the primer prepared and exposed as specified in 4.3.24 shall show no cracking, checking, flaking, or loss of adhesion, and no more than a trace of rusting (No. 9, ASTM D 610). On removal of the coating system, the surface of the metal shall show no more than a trace of rusting, pitting, or corrosion on the panels.

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 (examinations and tests) 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 ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Material Safety Data Sheet. Material Safety Data Sheets not prepared in accordance with FED-STD-313 shall be cause for rejection.

4.2 Sampling, inspection and testing. Unless otherwise specified, sampling, inspection and testing shall be in accordance with FED-STD-141, section 1000.

4.2.1 Classification of inspections. Inspection under this specification shall be for the following:

a. Qualification (see 4.2.1.1 and 6.3).
b. Quality conformance (see 4.2.1.2).

4.2.1.1 Qualification inspection. Qualification shall be conducted by the qualifying activity (see 6.3). Qualification inspection shall consist of tests for all requirements in section 3. The results of each test shall be compared with the applicable requirement in section 3. Failure to conform to any requirement shall be counted as a defect, and the paint represented by the sample test shall not be approved for inclusion on the federal Qualified Products List (QPL) under this specification.

4.2.1.1.1 Plant qualification. Different plants of the same manufacturer must be qualified individually in order to be listed on the Qualified Products List.

4.2.1.2 Quality conformance inspection. Quality conformance inspection shall consist of the following: VOC, condition in container, total solids, viscosity, fineness of grind, gloss, and dry times as specified in sections 3 and 4.

4.2.2 Standard conditions. Unless otherwise specified, all test specimens shall be prepared and tested at a temperature of 21 to 27 °C and a relative humidity of 40-65 percent.

4.3 Test methods.

4.3.1 Test conditions. The testing conditions shall be in accordance with FED-STD-141, section 9 or in accordance with the appropriate ASTM method except as otherwise specified herein. Failure of any test result to fall within the range specified in section 3 as applicable, shall constitute failure of the applicable test.

4.3.2 Test procedures. The following tests (see table III) shall be conducted in accordance with FED-STD-141, ASTM, or as specified herein. The right is reserved to make any additional tests deemed necessary to determine that the coating meets the requirements of this specification. Unless otherwise specified, testing shall be done on the packaged material.

4.3.3 Test panels. Except as otherwise specified, metal panels used for test purposes shall be of two types:

a. Steel, cold rolled, 0.032 inches thick, SAE 1010. 1/
b. Steel, tinplated, 0.010 inches thick. 2/

4.3.4 Color. Determine the color in accordance with ASTM D 1729 by applying a film with a 0.002 inch (0.004 gap clearance) film applicator on a black and white hiding chart. 3/ Evaluate for compliance with 3.3.

4.3.5 Pigment analysis. Extract the pigment as in FED-STD-141, method 4021 using extraction mixture C. Make appropriate qualitative and quantitative tests on the extracted pigment to determine if any permissible pigments were used. Nonconformance to the requirements in 3.4.1 shall constitute failure of this test.

1/ Q-Panel Company, Cleveland, Ohio, S412, or equivalent.

2/ Q-Panel Company, Cleveland, Ohio, DT-36, or equivalent.

3/ Leneta Company, Ho-Ho-Kus, NJ, Form 2A, or equal.

4.3.5.1 Quantitative Fe_2O_3. Determine Fe_2O_3 content by ASTM D 50, Section 10 and 11. Nonconformance to the requirement in table I shall constitute failure of this test.

TABLE III. Index.

TEST	TEST PARAGRAPH	REQUIREMENT PARAGRAPH	ASTM METHOD	FED-STD-141 METHOD
Color	4.3.4	3.3	D 1729	-
Pigment analysis	4.3.5	Table I		4021
Extender pigment	4.3.6	Table I	-	7281
Chromium content	4.3.7	Table II	-	-
VOC content	-	Table II	D 3960	-
Total solids	-	Table II	D 2369	-
Pigment content	-	Table II	D 2371	-
Lead content	4.3.8	Table II	D 3335	-
Water	-	Table II	D 1364	-
Coarse particles	-	Table II	D 185	-
Solvent analysis	4.3.9	3.4.3	D 3271	-
Specular gloss	4.3.10	Table II	D 523	2021
Viscosity, reduced	4.3.11	Table II	D 562	-
Fineness of grind	-	Table II	D 1210	-
Drying time	4.3.12	Table II	D 1640	-
Condition in container	4.3.13	3.6.1	-	3011
Storage stability				
Full container	4.3.14.1	3.6.2.1	-	-
Partially full	4.3.14.2	3.6.2.2	-	-
Accelerated stability	4.3.15	3.6.3	-	-
Suspension properties	4.3.16	3.6.4	-	-
Spraying properties	4.3.17	3.6.5	-	4331
Flexibility	4.3.18	3.6.6	-	6221
Knife test	4.3.19	3.6.7	-	6304
Water resistance	4.3.20	3.6.8	-	-
Hydrocarbon resistance	4.3.21	3.6.9	-	-
Adhesion	4.3.22	3.6.10	-	-
Salt spray resistance	4.3.23	3.6.11	-	-
Weather resistance	4.3.24	3.6.12	-	-

4.3.5.2 Zinc phosphate content. Determine the zinc phosphate content in accordance with 4.3.2.2.1 and 4.3.2.2.2.

4.3.5.3 Determination of zinc.

4.3.5.3.1 Reagents.

a. Buffer solution (pH 10). 350 mL concentrated NH_4OH + NH_4Cl + H_2O to give 1000 mL.
b. Eriochrome black T (0.5 percent). 0.25 g eriochrome black T + 2.2 g hydroxylamine hydrochloride per 50 mL methanol solution.

c. Primary standard zinc oxide (0.200N). Accurately weight 4.069 g of oven-dried ZnO. Dissolve it in 250 mL of the buffer solution and dilute to 500.0 mL.
d. N disodium ethylendiaminetetraacetate dihydrate (EDTA). 37.2 g EDTA per liter aqueous solution.

4.3.5.3.2 Procedure.

a. Accurately weigh approximately 1.0 g of pigment into a 250 mL glass-stoppered Erlenmeyer flask.
b. Add 25 mL of buffer, stopper, and shake vigorously every few minutes over a period of 30 minutes.
c. Filter through fine paper into a 400 mL beaker, washing well with water until 200 mL of filtrate are collected.
d. Add 20.0 mL of the EDTA (an excess) to the filtrate.
e. Add 10 drops of eriochrome black T.
f. Titrate with standard ZNO to a wine-red end point (^{v}s).
g. Run a blank by titrating 20.0 mL of the EDTA in 200 mL of an aqueous solution containing 25 mL of the buffer (^{v}b).

4.3.5.3.3 Calculations.

$$\text{Percent Zn} = \frac{(^{v}b) - (^{v}s) \times 0.2 \times 3.269}{\text{Sample weight}}$$

$$\text{Percent zinc phosphate} = \frac{(^{v}b) - (^{v}s) \times 0.2 \times 7.035}{\text{Sample weight}}$$

Where: ^{v}b = Milliliters of ZnO for blank, and
^{v}s = Milliliters of ZnO for sample

4.3.5.4 Determination of phosphate.

4.3.5.4.1 Reagents.

a. Concentrated NH_4OH
b. Concentrated HNO_3
c. NH_4NO_3
d. Ammonium molybdate - Johnson's Formula: Mix 455 g of $(NH_4)_6$. Mo_7O_24. $4H_2O$ and 50 g of NH_4NO_3 with 18 mL of concentrated NH_4OH and 20 mL H_2O. Stir. Dilute to about 700 mL with H_2O, heat with occasional stirring until all salts have dissolved. Dilute to 1000 mL. Let stand overnight. Filter through fine paper but do not wash the residue.

4.3.5.4.2 Procedures.

a. Accurately weigh approximately 2 g of pigment into a 250 mL glass-stoppered Erlenmeyer flask.
b. Add 25 mL of concentrated NH_4OH, stopper, and shake vigorously every few minutes over a period of 60 minutes.
c. Add 25 mL of H_2O and filter through fine paper into a 400 mL beaker, washing well with water.

d. Neutralize the filtrate with 7.5N HNO_3 (requires about 35 mL).
e. Add 15 mL concentrated HNO_3 and 6 g of NH_4NO_3. Stir.
f. Heat the clear solution to 80 °C (no higher) and add 75 mL of ammonium molybdate with constant stirring.
g. Stir for several minutes and let the precipitate settle for 2 hours.
h. Filter through a tared crucible (gooch or medium glass), transfer the precipitate, and wash with 1 percent HNO_3 (5 mL concentrated HNO_3 per 500 mL solution). The washing should be thorough.
i. Give the collected precipitate a final wash with a small amount of water.
j. Dry the crucible for 2 hours in a 105 °C oven.
k. Cool crucible in a desiccator and determine the weight of the precipitate to the nearest one-tenth mg. (It should not exceed 3 g; if it does, repeat the determination with a smaller sample).

4.3.5.4.3 Calculations.

$$\text{Percent } PO_4 = \frac{\text{Weight. PPT. x } 5.029}{\text{Sample weight}}$$

$$\text{Percent zinc phosphate} = \frac{\text{Weight. PPT. x } 11.18}{\text{Sample weight}}$$

4.3.5.4.4 Failure criteria. Nonconformance to table I shall constitute failur of this test.

4.3.6 Extender pigment. Determine siliceous matter and barium sulfate by the applicable portions of FED-STD-141, method 7281. Evaluate for compliance with table I.

4.3.7 Chromium (hexavalent) content.

a. Reagents: 25 percent aqueous KOH.
b. Procedure:

(1) Add 5 mL of 25 percent aqueous KOH to 0.5 g of the extracted pigment contained in a 15 mL centrifuge tube.
(2) Agitate by shaking the tube for a few minutes, then centrifuge.
(3) The supernatant liquid should be colorless. A yellow color indicates the presence of chromate. Nonconformance to the requirement in 3.4.1 shall constitute failure of this test.

4.3.8 Lead content. Determine the percent of lead in accordance with ASTM D 3335 or by x-ray emission spectrometric analysis in accordance with the manufacturer's manual. Evaluate for compliance with table II.

4.3.9 Solvent analysis. Evaluate for compliance to 3.4.3 in accordance with ASTM D 3271.

4.3.10 Specular gloss. Prepare a drawdown of the primer using a 0.002 inch (0.004 gap clearance) film applicator on a glass panel according to FED-STD-141,

method 2021 and air dry for 24 hours. Measure the 60 degree specular gloss in accordance with ASTM D 523 and evaluate for compliance with table II.

4.3.11 Viscosity (reduced). Reduce eight parts, by volume, of the primer with one part, by volume, of thinner conforming to TT-T-306, type II. Measure the viscosity in accordance with ASTM D 562 and evaluate for compliance with table II.

4.3.12 Drying time. Prepare a drawdown of primer, reduced as specified in 4.3.11, using a 0.002 inch (0.004 gap clearance) film applicator on a glass panel and air dry for the specified time. Check the drying time in accordance with ASTM D 1640 and evaluate for compliance with table II.

4.3.13 Condition in container. Determine package condition of the primer in accordance with FED-STD-141, method 3011 and observe for compliance with 3.6.1. Determine pigment settling by proceeding as in FED-STD-141, method 3011, but do not stir. Reseal and then agitate the can for 3 minutes on a paint shaker [4/]. On reexamination of the contents, the disclosure of any gel bodies or undispersed pigment indicates unsatisfactory settling properties. Observe for compliance with 3.6.1.

4.3.14 Storage stability.

4.3.14.1 Full container. Read and record the viscosity according to ASTM D 562. Momentarily invert a full standard quart can before storing for 12 months at standard conditions (see 4.2.2). After the aging period, evaluate for compliance with 3.6.2.1.

4.3.14.2 Partially filled container. Fill a 1-pint friction top can three fourths full with primer. Secure the top tightly and invert the can momentarily. Store the can in an upright position for 48 hours and check for skinning. Reseal the can and age for 72 hours at 60 °C. After the aging period, evaluate for compliance with 3.6.2.2.

4.3.15 Accelerated stability. Fill an 8 ounce wide-mouth glass jar, approximately 4-1/2 inches high and 2 inches in diameter, with the packaged primer. Secure the cover tightly and invert the jar momentarily to check for leaks. Place the sample in a 60 ±2 °C (140 ±4 °F) oven in an upright position for 7 days. After this period, allow to cool to room temperature and examine the contents. Nonconformance to 3.6.3 shall constitute failure of this test.

4.3.16 Suspension properties. Reduce the primer as specified in 4.3.11. Place six ounces of the reduced material in an 8-ounce glass jar. Allow the stoppered jar to remain undisturbed for 24 hours and then place the unopened jar on a paint shaker as specified in 4.3.13 and agitate the contents for 20 seconds. Reexamine the material for any evidence of non-homogeneity or undispersed pigment. Nonconformance to 3.6.4 shall constitute failure of this test.

4.3.17 Spraying properties. Reduce the primer as specified in 4.3.11. Holding the spray gun 8-10 inches from a smooth steel panel, spray to a dry film thickness

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[4/] An apparatus of this type, powered by a 1/4 HP motor, 615 cycles per minute, is manufactured by Red Devil Tools, Irvington, NJ.

of 0.0013 to 0.0017 inches according to FED-STD-141, method 4331. Allow to air dry for 24 hours and evaluate for compliance to 3.6.5.

4.3.18 Flexibility. Using methyl ethyl ketone and a soft cloth, clean the steel tinplated panels and prepare drawdowns using a 0.002 inch film applicator (0.004 inch gap clearance). Air dry the panels for two days and force dry 24 hours at 60 ±2 °C. Condition the panels for 1 hour at standard conditions and bend over a 1/4-inch mandrel. Evaluate according to FED-STD-141, method 6221. Check for compliance with 3.6.6.

4.3.19 Knife test. Using the flat portion of the panel used for the flexibility test (see 4.3.19), perform this test in accordance with FED-STD-141, method 6304 and check for compliance with 3.6.7.

4.3.20 Water resistance. Prepare drawdowns on steel tinplated panels as in 4.3.18. Air dry the panels for 7 days and immerse halfway in distilled water for 18 hours. Evaluate for compliance with 3.6.8.

4.3.21 Hydrocarbon resistance. Prepare drawdowns on steel tinplated panels as in 4.3.18. Air dry the panels for 7 days and immerse halfway in a hydrocarbon mixture consisting of 70 percent by volume of iso-octane and 30 percent by volume of toluene for 4 hours. Evaluate for compliance with 3.6.9.

4.3.22 Adhesion. Prepare panels as in 4.3.18 but air dry for seven days and force dry for 48 hours at 60 ±2 °C. Condition the panels for one hour at standard conditions and then score a line through to the metal across the width of the film using a sharp pointed knife. The film shall then be taped perpendicular to and across the score line with water resistant, pressure sensitive adhesive tape (3/4-inch width) conforming to PPP-T-60, type IV. The tape shall be pressed down with two passes of a 4-1/2 pound rubber covered roller, approximately 3-1/2 inches in diameter by 1-3/4 inches in width. The surface of the roller shall have a durometer hardness value within the range of 70 to 80 [5/]. Allow 10 seconds for the test area to return to room temperature. Grasp a free end of the tape and at a rapid speed, strip it from the specimen by pulling the tape back upon itself at 180 degrees and check for film removal. Nonconformance to 3.6.10 shall constitute failure of this test.

4.3.23 Salt spray resistance. Solvent clean three 4 x 12 inch steel panels using MEK and a soft cloth. Reduce the primer as in 4.3.10 and spray the panels to a dry film thickness of 0.0013 to 0.0017 inches on the ground side and air dry for 7 days. Coat edges and uncoated metal surfaces with wax or other suitable coating, but do not score. Expose the panels to 5 percent salt spray for 48 hours as specified in ASTM B 117. Remove the panels, wash gently in running water no warmer than 100 °F (38 °C) until free from any visible salt deposits. Examine immediately for compliance with 3.6.11. Strip the primer from the panels and inspect the panels for rust, pitting or corrosion. Nonconformance to 3.6.11 shall constitute failure of this test.

4.3.24 Weather resistance. Prepare two panels as in 4.3.23. Allow to air dry for 7 days and place on outdoor exposure for 24 months at an angle of 45 degrees

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5/ A roller of this type is available from the Pressure Sensitive Tape Council, 1201 Waukegan Road, Glenview, IL 60025.

facing south in the latitude of Washington, DC. After exposure, examine for compliance with 3.6.12. Then strip the primer film from the metal and inspect the surface. Nonconformance to 3.6.12 shall constitute failure of this test.

4.4 Inspection of packaging. The preservation, packing and marking specified in 5.1 and 5.2 shall be examined for quality conformance in accordance with the applicable requirements of PPP-P-1892.

5. PACKAGING

5.1 Preservation and packing. The primer shall be preserved and packed in accordance with PPP-P-1892. The level of preservation and of packing shall be level A, B, or C as specified (see 6.2). The primer shall be furnished in 1-pint cans, 1-gallon cans, 5-gallon pails, or 55-gallon drums as specified (see 6.2).

5.2 Marking. Marking of each container, intermediate containers, shipping containers, and palletized loads shall be in accordance with PPP-P-1892. Special markings shall be as specified in the contract or purchase order (see 6.2).

5.2.1 User instruction marking. In addition to the markings specified in 5.2, all containers shall include the VOC content in grams per liter of coating when reduced as specified with TT-T-306, type II, and shall be legibly marked or labeled with the following:

CAUTION: The Surgeon General requires airline respirators to be used unless air sampling shows exposure to be below standards. Then, either chemical cartridge respirators or airline respirators are required. Avoid contact with skin and eyes. Use adequate ventilation. For other safety recommendations, refer to the Material Safety Data Sheet. Keep containers closed.

6. NOTES.

(This section contains information of a general or explanatory nature that may be helpful but not mandatory.)

6.1 Intended use. This specification covers an alkyd primer that when reduced as specified shall have a maximum volatile organic compound (VOC) content of not more than 420 grams per liter. The intended use is on properly solvent cleaned or pretreated metal surfaces where exposure to lead or chromate pigments is not permitted. It is not intended for use on the inside of potable water tanks or for marine use.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number and date of this specification.
b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
c. Level of preservation and packing required (see 5.1).
d. Size of container required (see 5.1).
e. Any special marking requirement (see 5.2).

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 contractors 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 Belvoir Research, Development, and Engineering Center, ATTN: SATBE-TVO, Fort Belvoir, VA 22060-5606, and information pertaining to qualification of products may be obtained from this activity.

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

6.5 Material Safety Data Sheet. Contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in FED-STD-313, Appendix B.

6.6 Subject term (key word) listing.

Alkyd primer
Fast dry
Low VOC coating
Volatile organic compounds (VOCs)

6.7 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:
Army - ME
Air Force - 99

Review activity:
Air Force - 84

User activities:
Army - AT
Navy - OS

Preparing activity:
Army - ME

Project 8010-0460

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter sho be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-P-11414E	2. DOCUMENT DATE (YYMMDD) 920722

3. DOCUMENT TITLE Primer, Alkyd, Fast Dry, Corrosion Inhibiting, Lead and Chromate Free, VOC Compliant

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (if applicable) (2) AUTOVON	7. DATE SUBMITTED

8. PREPARING ACTIVITY

a. NAME Betty Taylor	b. TELEPHONE (Include Area Code) (1) Commercial (703) 704-3466 (2) AUTOVON 654-3466
c. ADDRESS (Include Zip Code US Army Belvoir RDE Center ATTN: SATBE-TSE Fort Belvoir, VA 22060-5606	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-346 Telephone (703) 756-2340 AUTOVON 289-2340