Downloaded from http://www.everyspec.com

TT-E 545C
September 11, 1986
SUPERSEDING
TT-E-543A
February 24, 1966
and TT-E-545B
December 30, 1975

FEDERAL SPECIFICATION

PRIMER (ENAMEL-UNDERCOAT, ALKYD, ODORLESS, INTERIOR, FLAT, TINTS AND WHITE)

This specification is approved by the Commissioner, Federal Supply and Service, General Services Administration, for the use of all Federal Agencies.

1 SCOPE. This specification covers a primer (enamel-undercoat) for interior alkyd and latex paints. This non-lead and low VOC primer is formulated for use in air quality regulated environments.

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:

SS-L-30 - Lath, and Board Products, Gypsum
TT-E-508 - Enamel, Interior, Semigloss
TT-T-291 - Thinner, Paint, Mineral Spirits, Regular and Odorless
PPP-P-1892 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing, and Marking

Federal Standards:

Fed. Test Method Std. No. 141 - Paint, Varnish, Lacquer, and Related Materials; Methods of Sampling and Testing
Fed. Std. No. 313 - Material safety Data Sheets, Preparation and the Submission of

Military Standards:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes

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

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

American Society for Testing and Materials (ASTM) Standards:

D 185 - Coarse Particles and Pigments, Pastes, and Paints
D 523 - Specular gloss
D 562 - Consistency of Paints Using the Stormer Viscometer
D 563 - Phthalic Anhydride Content of Alkyd Resins and Resin Solutions
D 1210 - Fineness of dispersion of Pigment-Vehicle Systems
D 1296 - Odor of Volatile Solvents and Diluents
D 1729 - Visual Evaluation of Color Differences of Opaque Materials
D 1849 - Package Stability of Paint
D 2698 - Pigment Content of Solvent-Type Paints by High-Speed Centrifuging
D 2805 - Hiding Power of Paints
D 3278 - Flash Point of Liquid by Setaflash Closed Tester
D 3335 - Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy
D 3924 - Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials
D 3925 - Sampling Liquid Paints and Related Pigmented Coatings
D 3960 - Volatile Organic Content (VOC) of Paints and Related Coatings
E 97 - 45-deg, 0-deg Directional Reflectance Factor of Opaque Specimens by Broad-Band Filter Reflectometry

Downloaded from http://www.everyspec.com

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

South Coast Air Quality Management District (SCAQMD) Rules and Regulations:

Rule 102 - Definitions
Rule 1113 - Architectural Coatings

(Application for copies should be made to South Coast Air Quality Management District, 9150 Flair Drive, El Monte, CA 91131.)

3 REQUIREMENTS

3.1 Materials. The nonvolatile vehicle shall be a drying oil alkyd. Volatile organic content (VOC) shall be limited to 350 g/L (2.92 lb/gal) as defined by SCAQMD Rule 1113, and shall not be photochemically reactive as defined in SCAQMD Rule 102. Halogenated solvents shall not be used. Material not specified shall be selected by the supplier to meet all requirements of this specification.

3.2 Quantitative requirements. The primer shall conform to the quantitative requirements in table I.

Table I. Quantitative requirements

Characteristics	Requirements Minimum	Maximum
Water, percent mass of paint	--	0.5
Fineness of dispersion	4	--
Coarse particles and skins, percent mass of pigment	--	0.5
Consistency, KU	72	89
Drying time, hours		
Set to touch	1/2	2
Dust-free	--	12
60° specular gloss	3	10
Flash point, $^{\circ}C$ ($^{\circ}F$)	38 (100)	--
Contrast ratio [at 15.5 m^2/L (630 ft^2/gal)]		
Reflectivity 78 and above	0.95	--
74 - 77	0.96	--
70 - 73	0.97	--
66 - 69	0.98	--
61 - 65	0.99	--
60 and lower	1.00	--
Lead, percent mass of nonvolatile	--	0.06

3.3 Qualitative requirements.

3.3.1 Condition in container. When tested as specified in table II, the freshly opened container shall show no evidence of caking, dry settled pigment, gelling or skinning. It shall remix to a uniform condition by not more than 5 minutes hand stirring.

3.3.2 Skinning. A sealed, three-quarter filled container shall not skin within 48 hours when tested as specified in table II.

3.3.3 Accelerated storage stability. When tested as specified in 4.3.1, the paint shall show no skinning, gelling, or pigment settling which cannot be dispersed to a uniform condition by 5 minutes hand-stirring. The aged paint shall meet the fineness of dispersion, consistency, and application properties requirements.

3.3.4 Color. When tested as specified in table II at complete hiding, the color of the primer shall be a critical match to the color specified.

3.2.5 Odor. When tested as in table II, the odor of the primer shall be similar to TT-T-291, Type III. There shall be no residual odor after 24 hours air drying.

3.2.6 Working properties. When brushed, rolled, or sprayed on wallboard as specified in 4.3.2, the primer shall flow and level uniformly. It shall dry to a smooth uniform film free from brush marks, conspicuous laps and dusting.

3.3.7 Enamel holdout. The difference in 60° gloss between one and two topcoats shall not be greater than 5 percent of the one-coat gloss value, and the topcoated panel shall show no suction spotting when tested as specified in 4.3.3.

3.3.8 Flexibility. When tested as in 4.3.4, the primer shall not crack or flake.

Downloaded from http://www.everyspec.com

3.3.9 Knife test. When tested as in 4.3.5, the primer shall ribbon or curl from the panel. The cut shall show beveled edges.

3.4 Air quality regulation marking. Each unit container and shipping container marking shall include the weight of volatile organic compounds (VOC) in grams per liter and pounds per gallon of primer, referenced to SCAQMD Rule 1113; shall state that the contents are not photochemically reactive, referenced to Rule 102; and shall specify that the paint is to be used without thinning when required by applicable air quality control districts.

3.5 Material safety data sheets (MSDS). A material safety data sheet shall be prepared for the primer by the manufacturer in accordance with Fed. Std. No. 313 and submitted as directed by the contracting officer (see 6.2).

4 QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or order, the contractor is responsible for the performance of all inspection requirements specified herein using facilities approved by the Government. The Government reserves the right to perform any of the inspections set forth herein when deemed necessary to assure that the paint conforms to prescribed requirements.

4.2 Classification of inspections. Inspections shall be classified as follows:

(a) Quality conformance inspection (see 4.3).
(b) Inspection of preparation for delivery (see 4.2.1).

4.2.1 Preparation for delivery. A random sample of filled containers shall be selected in accordance with MIL-STD-105, inspection level S-2, acceptable quality level (AQL) 2.5 percent defective, and examined for compliance with 3.4 and section 5.

4.3 Quality conformance inspection. The paint shall be sampled in accordance with ASTM D 3925, and tested in accordance with the methods specified in table II and as otherwise specified herein to determine compliance with the requirements of section 3. Unless otherwise specified, all tests shall be conducted at conditions specified in ASTM D 3924. Failure of any test shall be cause for rejection of the lot from which the sample was taken.

TABLE II. Index

Characteristic	Requirement Paragraph	Test Methods: Fed. Std. Test Method No. 141	Test Methods: ASTM Method	Reference Paragraph
Volatile organic content(VOC)	3.1	---	D 3960	
Condition in container	3.3.1	3011	---	---
Skinning	3.3.2	3021	---	---
Accelerated storage stability	3.3.3	---	D 1849	4.3.1
Color	3.3.4	---	D 1729	---
Odor	3.3.6	---	D 1296	---
Working properties	3.3.7	---	---	4.3.2
Enamel holdout	3.3.8	---	---	4.3.3
Flexibility	3.3.9	6221	---	4.3.4
Knife test	3.3.10	6304	---	4.3.5
Water	Table I	4081	---	---
Coarse particles	Table I	---	D 185	---
Consistency	Table I	---	D 562	---
Drying time	Table I	4061	---	---
60° specular gloss	Table I	---	D 523	4.3.6
Flash Point	Table I	---	D 3278	---
Reflectance	Table I	---	E 97	---
Fineness of dispersion	Table I	---	D 1210	---
Contrast ratio	Table I	---	D 2805	---
Lead	Table I	---	D 3335	4.3.7

4.3.1 Accelerated storage stability. Store a full, sealed one-liter (one-quart) can of paint for 30 days at 52 ± 2°C (125 ± 4°F) and evaluate condition as specified in ASTM D 1849. After evaluation, test for compliance with fineness of dispersion, consistency, and brushing properties.

4.3.2 Working properties. Prepare a 122 cm square (4 ft^2) panel of gypsum wallboard conforming to SS-L-30. Mark off the board in 30.5 cm square(1 ft^2) sections starting from the left as part 1 and leave this part bare. Apply the primer by brushing on part 2, rolling on part 3, and spraying on part 4, each at a coverage rate of 11 m^2/L (450 ft^2/gal). After 24 hours air-drying, evaluate for compliance with 3.3.7.

Downloaded from http://www.everyspec.com

4.3.3 Enamel holdout. Brush semigloss enamel conforming to TT-E-508 over one-half of the dried panel prepared in 4.3.2 at 11.0 m^2/L (450 ft^2/gal), air-dry 24 hours, and similarly brush the enamel over the entire panel. Air-dry 48 hours and measure the 60° gloss over each area in accordance with ASTM D 523. Evaluate for compliance with 3.3.8.

4.3.4 Flexibility. Determine flexibility in accordance with method 6221 of Fed. Test Method Std. No. 141. Apply the paint at a dry film thickness of 37 ± 2 um (0.0015 ± 0.0001 inch) to a solvent-cleaned, tinplate panel prepared in accordance with method 2012 of Fed. Test Method Std. No. 141. Air dry 48 hours at room temperature and bend the panel over a 3.18 mm (1/8 inch) diameter mandrel and examine in accordance with method 6221 of Fed. Test Method Std. No. 141 for compliance with 3.3.9.

4.3.5 Knife test. Cut the film from a flat portion of the panel used in 4.3.4, and examine in accordance with method 6304 of Fed. Test Method Std. No. 141 for compliance with 3.3.10.

4.3.6 Specular gloss. Draw down the primer on plane, opaque, white glass panels specified in 2.1.5 of method 2021 of Fed. Test Method Std. No. 141. Use a film applicator which will produce a wet film thickness of 76 ± 2 um (0.003 ± 0.0001 inch). Determine 60° specular gloss in accordance with ASTM D 523 after 48 hours drying at standard conditions in a dust-free environment.

4.3.7 Lead content. Determine lead content in accordance with ASTM D 3335 or by the use of an X-ray fluorescence spectrometer capable of determining lead at a minimum range of 0.03 through 1.0 percent mass of nonvolatile with an accuracy within plus or minus 5.0 percent. The X-ray method shall be used in case of dispute.

5 PREPARATION FOR DELIVERY

5.1 Packaging, packing, and marking. The paint shall be furnished in quantities specified (see 6.2). The packaging, packing, and marking shall be in accordance with PPP-P-1892. The levels of packaging and packing shall be A, B, or C as otherwise specified (see 6.2). The marking shall be civil or military as specified (see 6.2). Air quality regulation marking shall be as specified (see 3.4).

6 NOTES

6.1 Intended use. The primer (enamel-undercoat) covered by this specification is odorless and is intended specifically for use as an undercoat for interior enamels and latex paints. It is characterized by easy brushing, rapid drying, smooth leveling, and good hiding. New, dry plaster surfaces and composition wallboard should first be sealed with one or two coats of sealer conforming to TT-P-650, or with other suitable sealer. Interior masonry and brick should be dry, and usually require two coats of special alkali-resistant primer if Portland cement is present. Old painted surfaces which are in good condition and not too dirty may be coated directly with the undercoat before a new coat of enamel or other paint is applied. New wood may be primed with this undercoat. The undercoat may be lightly tinted, if desired, and must be dried thoroughly before application of top coats or enamels.

6.2 Ordering data. Purchasers should include the following information in procurement documents:

(a) Title, number, and date of this specification
(b) Color required (see 3.3.4)
(c) Material Safety Data Sheets (MSDS) required (see 3.5)
(d) Quantity and size of container required (see 5.1)
(e) Level of packaging, packing, and marking required (see 5.1)

MILITARY COORDINATION ACTIVITY
Army - ME

MILITARY REVIEW INTEREST
Navy - YD

CIVIL AGENCY COORDIATING AQCTIVITY
GSA - FSS
USDA - Forest Service
HUD - HCC
VA - OSS

PREPARING ACTIVITY
GSA - FSS

PROJECT NUMBER
8010 - 1111