TT-P-1411A
November 15, 1973
SUPERSEDING
Int. Fed. Spec. TT-P-001411 (HUD-HAA)
December 19, 1968

FEDERAL SPECIFICATION

PAINT, COPOLYMER-RESIN, CEMENTITIOUS (FOR WATERPROOFING CONCRETE AND MASONRY WALLS)

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers two types of ready-mixed, cementitious paints for water proofing basement exterior and interior walls for a period of at least five years. [1]

1.2 Classification.

1.2.1 Type types of paints based on binders (vehicle) (see 3.2.2.1 and 3.2.2.2) are the following:

Type I - For exterior use.
Type II - For interior use.

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:

RR-S-366 - Sieves, Standard for Testing Purposes.
SS-C-192 - Cement, Portland, White.
TT-P-143 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing and Marking of.
TT-T-291 - Thinner, Paint, Volatile Spirits, Petroleum Spirits.

Federal Standards:

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

Fed. Std. No. 595 - Colors.

(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 Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO., Forth Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

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

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 issue in effect on date of invitation for bids or request for proposal shall apply.

[1] A certificate of compliance from the supplier to this effect is necessary.

American Society for Testing and Materials (ASTM) Standards:

D-714 - Method of Evaluating Degrees of Blistering of Paints.
D-2088 - Determination of Low Concentration of Lead in Paint.

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

(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 Material. The ingredients used in the manufacture of the paint shall be of good commercial quality suitable for the purpose intended and the finish product shall comply to all the requirements specified herein. The paint shall not contain lead in excess of 0.5 percent by weight of total nonvolatile matter.

3.2 Composition

3.2.1 Pigments. The pigments or combination of pigments shall be as specified herein. (see table I). Extenders and shading pigments may be used to match the color desired provided the paint meets all the requirements.

3.2.1.1 Cement. The cement shall be Portland cement conforming to SS-C-192, Type I. A certificate of compliance from the supplier is necessary.

3.2.1.2 Extenders. The manufacturer is given latitude in the selection of extenders provided the end product meets all the requirements of the specification (see 4.3.11).

3.2.2 Vehicle. The vehicle shall be copolymerized resin and additives such as antiskinning agents, wetting agents, water repellents, plasticizers, suspension agents, etc., may be used provided the product meets all the requirements specified herein. The solvent or thinner used in the process shall be a thinner conforming to TT-T-291, Type II or a solvent system complying with "Rule 66". [1]

3.2.2.1 Vehicle for Type I. The resin used for Type I vehicle shall have a characteristic of Vinyl Toluene Acrylate as identified in figure 3.

3.2.2.2 Vehicle for Type II. The resin used for Type II vehicle shall have characteristic of Vinyl Toluene/Butadiene as identified in figure 4.

3.3 Qualitative requirements

3.3.1 Condition in container. The paint as received when tested as in 4.3.1 After storage as specified in 4.3.2.1.1, the paint shall show no livering, curdling, hard caking, or gummy sediment. It shall mix readily to a smooth homogeneous state.

[1] Information on Rule 66 may be obtained from the Los Angeles Air Pollution Control District, Los Angeles, California 90013.

3.3.2.2 Full container. The paint shall show no skinning, livering, curdling, hard and dry caking or tough, gummy sediment when tested as in 4.3.2.2. After aging for six months, the paint shall remix readily to a smooth homogeneous state. There shall be no change in drying time as specified in table I and the viscosity range shall be 90 to 130 K. U.

3.3.3 Brushing properties. The paint when tested as in 4.3.3 shall brush satisfactorily and shall dry to a uniform film, free from seeds, runs, sags, or streaks.

3.3.4 Spraying properties. The paint when tested as in 4.3.4 shall spray satisfactorily, and shall show no running, sagging, streaking or pronounced orange peel.

3.3.5 Recoating. When tested as in 4.3.5 recoating of the dried film shall produce no film defects.

3.3.6 Color. The color of the paint specified in the contract or purchase order (see 6.2) shall match that of the standard color chip in Fed. Std. No 595 when tested as in 4.3.6.

3.3.7 Flexibility. The paint ,when tested as in 4.3.7, shall withstand bending without cracking or flaking (no magnification).

3.3.8 Resistance to hydrostatic pressure. When tested as in 4.3.8 the cured film shall show no blisters, loss of adhesion, softening, discoloration, or any other film irregularities. If droplets or beads of water appear on the surface, they shall not be larger than size 5, figure 3 of ASTM D-714. In addition the frequency of these droplets should not exceed "Medium" shown in figure 3 of ASTM D-714.

3.3.9 Scrubbability. When the painted panels are tested as in 4.3.9 the paint shall not be worn through to the substrate in less than 6000 strokes (3000 cycles).

3.3.10 Water resistance. A cured paint prepared and tested as in 4.3.10 shall show no blistering, wrinkling when examined immediately after removal from the test. When examined 2 hours after removal there shall be no softening, cracking, or loss of adhesion.

3.4 Quantitative requirements

3.4.1 The quantitative requirements shall be as specified in Table I.

TABLE I. Quantitative requirements

Characteristics	Requirements	
	Minimum	Maximum
Pigment, percent by weight of paint	60.5	64.5
Vehicle, percent by weight of paint	35.5	39.5
Nonvolatile vehicle, percent by weight of vehicle	21.5	25.5
Consistency, Kerbs-Stormer, shearing rate, 200 r.p.m:		
Grams	350	600
Equivalent K. U.	100	120
Drying time:		
Set to touch, hours	1/4	1
Dry hard, hours	---	3
Pigment composition:		
Titanium dioxide, percent by weight of pigment	66.0	---
Portland cement, white, percent by weight of pigment [1]	40.0	44.0
Extender, percent by weight of pigment	49.0	56.5
Resin, percent by weight of nonvolatile vehicle	84.0	---
Weight per gallon, pounds	12.20	12.70
Lead content, percent by weight of total nonvolatile matter	---	0.5

[1] A certificate of compliance from the supplier is necessary.

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 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 that supplies and service conform to prescribed requirements.

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

4.3 Test procedures shall be conducted in accordance with Fed. Test Method Std. No. 141 and as hereinafter specified.

4.3.1 Condition in container. Determine package condition of the paint in accordance with method 3011 of Fed. Test Method Std. No. 141 for compliance with 3.3.1.

4.3.2 Storage stability.

4.3.2.1 Partially full container. Determine 48-hour skinning in accordance with method 3021 of Fed. Test Method Std. No. 141. Reseal and age 7 days at 60 deg. C. and observe for compliance with 3.3.2.1.

4.3.2.2 Full container. In accordance with method 3022 of Fed. Test Method Std.No.141 allow a full standard quart can of paint to stand undisturbed for six months and then examine the contents. Evaluate pigments settling or caking for compliance with 3.3.2.2.

4.3.3 Brushing properties. Observe for brushing properties in accordance with method 4321 of Fed. Test Method Std. No. 141 using commercially available cement asbestos panel (6 by 8 inches). Apply the paint at approximately 75 square feet per gallon and allow to dry for 24 hours at room temperature. Then evaluate for compliance with 3.3.3.

4.3.4 Spraying properties. Reduce the paint according to manufacturer's instructions and use spray apparatus recommended by the manufacturer. Observe spraying properties in accordance with method 4331 of Fed. Test Method Std. No. 141 using the same type of panel as in 4.3.3 and observe compliance with 3.3.4.

4.3.5 Recoating. Using the dried film prepared in 4.3.3, brush a coat of paint at approximately the same spreading rate and allow to dry for 48 hours. Observe for compliance with 3.3.5.

4.3.6 Color. Use the panel prepared in 4.3.3, except the panel shall be allowed to air-dry at room temperature for an additional 24 hours. Evaluate the color of the sample against a standard chip in Fed. Std. No 595 in accordance with method 4250 of Fed. Test Method Std. No. 141 and observe for compliance with 3.3.6.

4.3.7 Flexibility. Determine flexibility as in method 6221 of Fed. Test Method St. No. 141. Draw down a 2-inch wide film of paint with film applicator that will deposit a dry film thickness of about 1-1/2 mils on a flat, solvent cleaned tin panel. Air dry for 24 hours at room temperature and bake for 10 minutes at 221 deg. F +/- 5 deg. F. Conditions for 2 hours at room temperature then bend over one inch mandrel and observe for compliance with 3.3.7.

4.3.8 Resistance to hydrostatic pressure.

4.3.8.1 Test block. The test block shall conform with SS-C-621, Type 1, Class 3, Form A, Style B. This block is approximately 8 by 8 by 8 inches.

4.3.8.2 Preparation. The top and bottom of the block shall be sealed with suitable patching cement or mixture to insure tight seal (no leaks) between gaskets and top and bottom plates. Allow the patched areas to cure (at least 3 days) before application of the paint.

4.3.8.3 Application of paint. Brush a coat of paint on all four sides of the test block at a spreading rate of approximately 75 square feet per gallon and allow to cure for

24 hours. Apply a second coat at the same spreading rate and also allow to cure for 24 hours. The block is ready for test.

4.3.8.4 Procedure. Place the test block in a frame work consisting of metal frame (see figure 1) and a series of bolts with wing nuts for clamping the plate tightly against the gasket and block. The top metal plate shall be equipped with a nipple welded in the center. A pipe cap is drilled and tapped to receive a compressor tank or hand pump* (see figure 2). Fill the test block with water up to the top and keep it filled for 7 days. Screw on cap, clamp the top metal plate tightly, check for leaks on edges, and gasket and examine for irregularities of the paint film. Then apply 4-pound air pressure by suitable means either by manual pumping as shown in Figure 2 or from an air tank and maintain 4-pound pressure per square inch for 1/2 hour. Leave the apparatus intact for 24 hours. Apply a 4-pound pressure again and maintain the 4-pound per square inch pressure for 1/2 hour. Leave the apparatus intact for another 24 hours. Then examine for loss of adhesion, softening and other film irregularities and evaluate for compliance with 3.3.8.

* A pressurized cooling system including a pressure gauge may be procured from Robertshaw Controlc Co., Milford, Conn. 06361.

4.3.9 Scrubbability. Determine the scrubbability of the applied film using panel prepared as in 4.3.4 in accordance with method 6142 of Fed. Test Method Std. No. 141 for compliance with 3.3.9.

4.3.10 Water-resistance. Using a 0.0025 inch (0.0050 inch gap clearance) film applicator, draw down a film of paint on two steel panels, phosphoric acid etched, as in method 2011, procedure B of Fed. Test Method Std. No. 141 and air dry for 96 hours. On one panel, coat all exposed uncoated metal surfaces with wax or any suitable coating and immerse for 18 hours in distilled water in accordance with method 6011 of Fed. Test Method Std. No.141. Observe for compliance with 3.3.10 as specified.

4.3.11 Extenders. Combination of the following materials: sand, mica, asbestos, and magnesium silicate was found to be satisfactory. Sand is the major portion of the extender (see 6.4).

4.3.12 Determination of lead content.

4.3.12.1 Determine the concentration of lead in accordance with ASTM- D-2088.

4.3.12.2 Calculation.

$$\text{Lead percent by weight of total nonvolatile} = \frac{A \times 0.86623}{B} \times 100$$

Where: A = grams of lead oxide (PbO_2) in ash.
B = grams of total nonvolatile of paint or paint or dried paint film.

4.3.13 Inspection of preparation for delivery. The paint shall be examined for compliance with the packaging, packing and marking requirements of section 5 in accordance with TT-P-143. Any container in the sample having one or more defects, or under required fill, shall be rejected.

TABLE II. Index

Characteristics	Requirement reference	Applicable test Fed. Test Method Std. No. 141	Paragraph reference
Condition in container	3.3.1, 3.3.2.2	3011	4.3.1, 4.3.2.2
Storage Stability	3.3.2, 3.3.2.1	---	4.3.2, 4.3.2.1
Brushing properties	3.3.3	4321	4.3.2
Spraying properties	3.3.4	4331	4.3.4
Odor	3.3.5	4401	4.3.5
Color	3.3.6	4250	4.3.6
Flexibility	3.3.7	6221	4.3.7
Resistance to Hydrostatic pressure	3.3.8	--	4.3.8
Scrubbability	3.3.9	6142	4.3.9
Water resistance	3.3.10	6011	4.3.10
Consistency	Table I	4281	------
Drying time	Table I	4061	------
Pigment content	Table I	4021	------
Vehicle content	Table I	4051	------
Nonvolatile vehicle content	Table I	4053	------
Titanium dioxide	Table I	7081	------
Portland cement	Table I	----	------
Extender	Table I	----	4.3.11
Lead content	3.1 and Table I	----	4.3.12

5. PREPARATION FOR DELIVERY

5.1 Packaging, packing and marking. The paint shall be packaged, packed and marked in accordance with TT-P-143. The level of packaging shall be A, B, or C and the level of packing shall be A, B, or C as specified (see 6.2). The paint shall be 1-gallon metal can, 5-gallon steel pails or in 55-gallon steel drums as specified (see 6.2).

5.2 Special marking. Preparation of substrate and application instructions shall be furnished by supplier and shown on the reverse side of the container.

6. NOTES

6.1 Intended use. This specification covers a paint for exterior walls including interior walls below grade of formed concrete, concrete, concrete and cinder blocks and masonry products which have been properly prepared. Previously painted surfaces should be sand blasted to remove all loose, powdery or flaking material. Scraping or wire brushing may be employed if all paint can be removed. On porous or coarse surfaces two coats may be required to fill all voids and avoid pin holes which may allow water seepage. When properly applied with recommended coverage and with adequate curing, this paint should resist a 9 foot head of hydrostatic pressure. For decorative purposes, this coating may be painted with alkyd, latex, epoxy or urethane coating.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

(a) Title, number, and date of this specification.
(b) Type required (see 1.2.1).
(c) Color required (see 3.3.6).
(d) Size of container required (see 5.1).
(e) Levels of packaging and packing required (see 1.2.1).

6.3 Basis of purchase. The paint should be purchased by volume, the unit being a gallon of 231 cubic inches at plus 68 deg F. (20 deg. C.)

6.4 Sand. The white sand used in end product which the Dept. of Housing and Urban Development applied successfully have the following characteristics: Silica consisting of 99.8 percent silicon dioxide (SiO_2) with the following sieve analysis:

Mesh	Percent Retain On	Cumulative
50	00.60	00.60
70	13.80	14.40
100	24.10	38.50
140	25.30	63.80
208	19.50	83.30
270	10.10	93.30
Thru 270	6.60	-----

CIVIL AGENCY COORDINATING ACTIVITY:

Preparing activity:

GSA-FSS

Military Coordinating:

ADT. CG

Figure 1 - Component Parts: PHOTO NOT INCLUDED

Figure 2 - Hydrostatic Tester (Assembled): PHOTO NOT INCLUDED

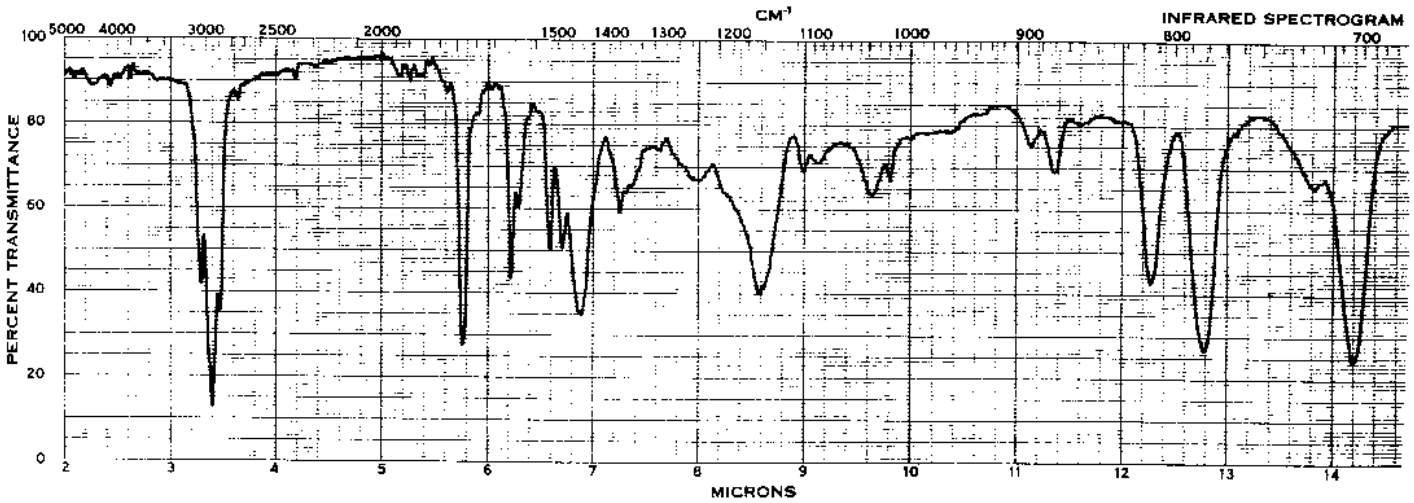

Figure 3

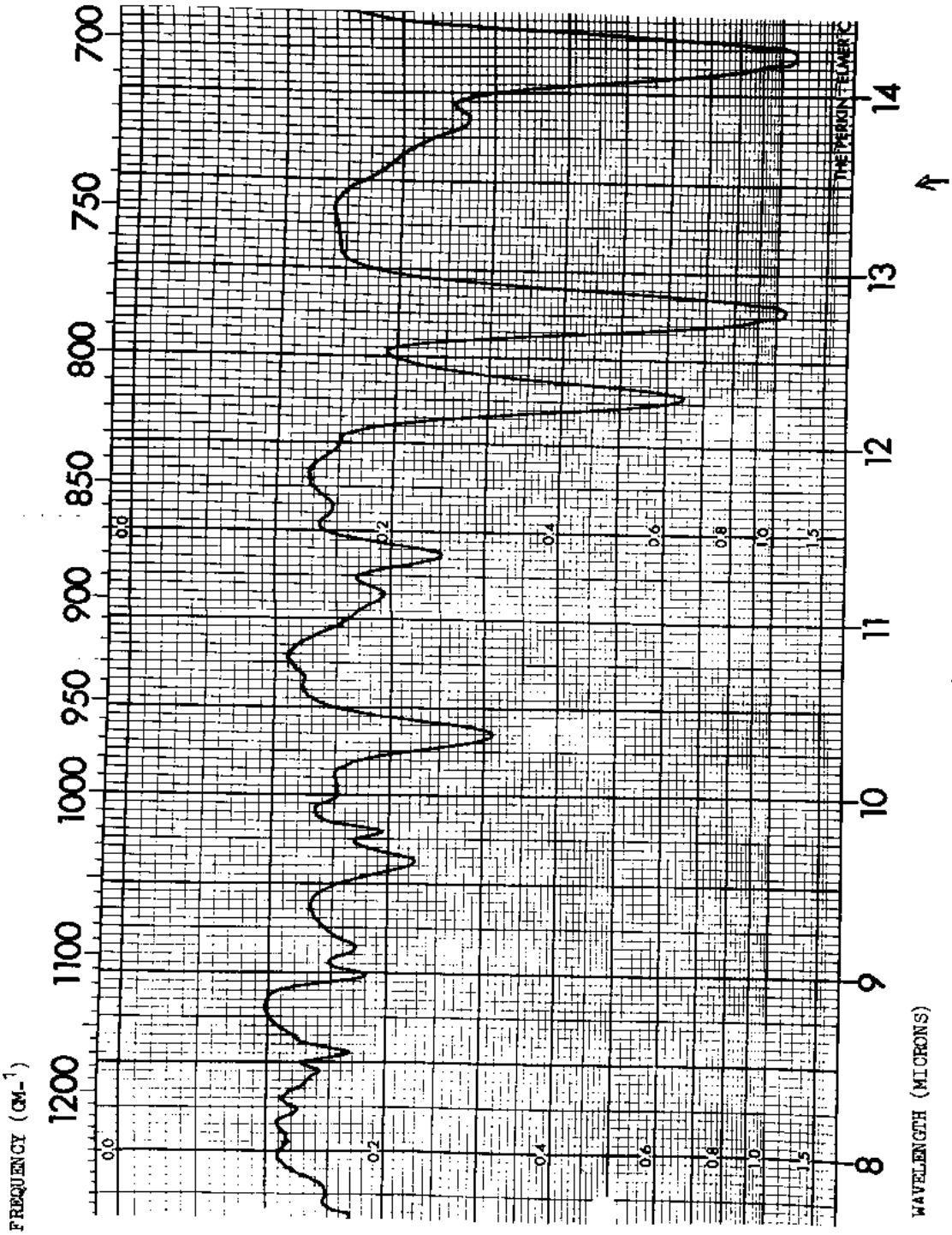

Figure #

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Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein. Price 15 cents each.

TT-P-1411A
AMENDMENT - 1
June 28, 1977

FEDERAL SPECIFICATION

PAINT, COPOLYMER-RESIN, CEMENTITIOUS (FOR WATERPROOFING CONCRETE AND MASONRY WALLS)

This amendment, which forms a part of Federal Specification TT-P-1411A, dated November 15, 1973, was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

PAGE 1

Under Federal Specifications, change "TT-P-143" to "PP-P-1892".

PAGE 2

Under "American Society for Testing and Materials (ASTM) Standards", delete:

"D 2088 - Determination of Low Concentrations of Lead in Paint."

and add:

"D 562 - Test for Consistency of Paints Using the Stormer Viscosimeter.
D 1296 - Test for Odor of Volatile Solvents and Diluents.
D 1308 - Test for Effect of Household Chemicals on clear and Pigmented Organic Finishes."

Paragraph 3.1, line 3: Change "0.5" to "0.06".

PAGE 3

Table I,last line, under maximum. Change "0.5" to "0.06".

PAGE 4

Paragraph 4.3. Delete and substitute:

4.3 Test procedures shall be conducted as indicated in table II and as hereinafter specified.

PAGE 5

Paragraph 4.3.10, line 5. Delete "Method 6011 of Fed. Test Method St. No. 141" and substitute "ASTM Method D 1308, Sec 5D".

Paragraphs 4.3.12, 4.3.12.1 and 4.3.12.2. Delete and substitute:

4.3.12 Lead content.

4.3.12.1 Sample preparation. Using a 0.006-inch film applicator plate, duplicate drawdowns for each sample of well-mixed paint shall be made on a standard paint penetration chart and dried for 24 hours. The drawdown shall be at least 10 inches long on the sealed portion of the penetration chart. The drawdown shall be cut into discs of appropriate size to fit the sample holder of a fluorescence X-ray spectrometer.

4.3.12.2 Procedure. Lead content shall be determined using an X-ray fluorescence spectrometer capable of determining lead content at a minimum level of 0.03 percent by weight of the total nonvolatile. The settings for a wavelength, dispersive fluorescence spectrometer shall be as follows: (1)

(1) Energy dispersive fluorescence spectrometers shall be set up according to the manufacturer's manual.

Element	Analytical Line	Angle	Crystal	Detection	Colli-mator	X-ray tube (Mo)	
Pb	L	33.93	LiF(200)	Flow S.C.	Fine	60kV	45Ma
Pb (background I)		33.00	LiF(200)	Flow S.C.	Fine	60kV	45Ma
Pb (background II)		33.50	LiF(200)	Flow S.C.	Fine	60kV	45Ma
Mo	K	20.33	LiF(200)	Flow S.C.	Fine	60kV	45Ma

Pulse height selection shall be used in all measurements and counting time shall be 100 seconds. Place the sample disc in the wavelength dispersive unit. Measure the count rates of lead, lead background, and Molybdenum Compton scattered background from the X-ray tube.

4.4.12.3 Calculation.

$$R = \frac{I_{Pb} - \frac{I_{Pb\ (Background\ I)} + I_{Pb\ (Background\ II)}}{2}}{I_{Mo}}$$

where I equals gross intensity. These results shall be compared with those obtained by a 0.06 percent lead standard made up from the same type of paint sample and evaluated for compliance with the requirement in table I.

Paragraph 4.3.13, line 2. Delete "TT-P-143" and substitute "PPP-P-1892".

Table II. Delete in its entirety and substitute:

TABLE II. Index

Characteristics	Requirement Reference	Applicable Test: Fed. Test Method Std. No. 141	Applicable Test: ASTM Method	Paragraph Reference
Condition in container	3.3.1, 3.3.2.2	3011	----	4,3.1, 4.3.2.2
Storage stability	3.3.2, 3.3.2.1	----	----	4.3.2, 4.3.2.1
Brushing properties	3.3.3	4321	----	4.3.2
Spraying properties	3.3.4	4321	----	4.3.4
Odor	3.3.5	----	D 1296	4.3.5
Color	3.3.6	4250	----	4.3.6
Flexibility	3.3.7	6221	----	4.3.7
Resistance to hydrostatic pressure	3.3.8	----	----	4.3.8
Scrubbability	3.3.9	6142	----	4.3.9
Water resistance	3.3.10	----	D 1308, Sec 5D	----- 4.3.10
Consistency	Table I	----	D 562	-----
Drying time	Table I	4061	----	-----
Pigment content	Table I	4021	----	-----
Vehicle content	Table I	4051	----	-----
Nonvolatile vehicle content	Table I	4053	----	-----
Titanium dioxide	Table I	7081	----	-----
Portland cement	Table I	----	----	-----
Extender	Table I	----	----	4.3.11
Lead content	3.1 and Table I	----	----	4.3.12

Paragraph 5.1, line 2. delete "TT-P-143" and substitute "PPP-P-1892".

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