

TT-P-1510A  
January 3, 1975  
SUPERSEDING  
Int. Fed. Spec. TT-P-001510 (COM-NBS)  
November 20, 1972

## FEDERAL SPECIFICATION

### PAINT, LATEX, EXTERIOR, FOR WOOD SURFACES, WHITE AND TINTS

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

#### 1. SCOPE

1.1 Scope. This specification covers an alkyd modified latex paint for use as a finish coat on properly primed or previously coated exterior wood surfaces. (see 6.1).

#### 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-S-346 - Siding (Shingles, Clapboards, and Sheets) Asbestos-Cement.
- TT-P-25 - Primer Coating, Exterior (Undercoat for Wood, Ready-Mixed, White and Tints).
- TT-P-143 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing and Marking of.

##### Federal Standards:

- Fed. Test Method Std. No. 141 - Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling and Testing.
- Fed. Test Method 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 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, US Government Printing Office, Washington, DC 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, Fort 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 and Standards from established distribution points in their agencies.)

##### Military Specifications:

- MIL-P-28582 - Primer Coating, Exterior, Lead Pigment-Free (Undercoat

for Wood, Ready-Mixed, White and Tints).

(Copies of Military Specifications and Standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

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

FSC 8010

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American Society for Testing and Materials (ASTM) Standards:

- D 79 - Zinc Oxide Pigment.
- D 476 - Titanium Dioxide Pigments.
- D 2486 - Scrub Resistance of Interior Latex Flat Wall Paints.
- D 3273 - Test for Resistance to Growth of Mold on the Surface of Interior Coatings.
- D 3335 - Determination of Low Concentration of Lead in Paint by Atomic Absorption Spectroscopy.

(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 paint as received shall consist of the pigment and vehicle specified, so combined as to produce a paint meeting all requirements of this specification.

3.1.1 Pigment. The opaque white pigment portion of white and tinted paints shall consist of chalk-resistant rutile titanium dioxide pigment conforming to ASTM D 476, type III or IV and zinc oxide pigment conforming to ASTM D 79. Tinting pigments shall be lightfast and alkali resistant.[1] Latitude is given in the selection of extender pigments provided other requirements of this specification are met.

3.1.2 Vehicle. The vehicle shall be of the acrylic latex type modified by the addition of long oil alkyd resin. The alkyd resin solids shall comprise not less than 10 percent nor more than 20 percent of the total vehicle solids by weight. A preservative shall be present together with the minimum amounts of other necessary additives such as emulsifiers, pigment-dispersants, antifoaming agents. etc., provided the paint meets all the requirements.

3.2 Quantitative requirements. The paint shall conform to the quantitative requirements of table I.

TABLE I. Quantitative requirements of the Paint

Characteristics	Requirements	
	Minimum	Maximum
Total solids, percent by weight of paint	56	----
Pigment, percent by weight of paint	----	38
Titanium dioxide pigment (Rutile),		
(a) pounds per gallon of white paint	2.4	----
(b) pounds per gallon of tinted paint	1.6	----
Lead content, percent by weight of nonvolatile	----	0.5
Zinc oxide pigment, pounds per gallon of paint	0.5	----
Total vehicle solids, percent by weight of paint	19	10
Alkyd resin, long oil, percent by weight of total vehicle solids	10	20
Weight per gallon of paint, pounds	11	----
Consistency, Krebs-Stormer, shearing rate 200 rpm		
Grams	190	300
Equivalent Krebs Units (K.U.)	80	95
Fineness of grind	4	----

Dry time set to touch, hours	1/6	1/3
Dry hard time, hours	---	1
Daylight directional reflectance, white only, percent	85	----
Opacity, dry, contrast ratio (0-005 inch wet film thickness)		
White paint	0.98	----
Tinted paint	0.99	----
Gloss, specular, 60 deg.	2	10
Scrub resistance, cycles	300	----

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

### 3.3 Qualitative requirements.

3.3.1 Condition in container. The paint as received shall be ready-mixed and shall show no evidence of mold growth, livering, skinning, putrefaction, corrosion of the container, or hard settling of the pigment. Any settled pigment shall be readily dispersible in the liquid portion by stirring to form a smooth homogeneous paint, free from persistent foam.

3.3.2 Color. The color shall be as specified in the procurement document (see 6.2). When tested as in 4.3, the color shall match standard chip in Fed. Std. No. 595.

3.3.3 Flexibility. When tested as described in 4.3.6, the paint shall show no evidence of cracking, chipping, or flaking.

3.3.4 Working properties. The paint shall be easily applied by brush, roller, or spray equipment as tested in 4.3.4. The paint shall show no streaks or foaming.

3.3.5 Appearance of dried paint. When applied by brushing, rolling, or spraying as specified in 4.3.4 the paint shall dry to a smooth, uniform finish free from craters and other defects caused by bubble retention. There shall be no "shiners" or "flashing", no streaking, and no conspicuous laps or objectionable brush marks.

3.3.6 Odor. The odor shall not be putrid or otherwise offensive or irritating before, during, and after application. There shall be no residual odor after 24 hours of drying.

3.3.7 Recoating properties. The paint shall produce no lifting, softening, pick-up, or other film irregularities upon recoating a previously painted surface when tested as in 4.3.4.

#### 3.3.8 Accelerated weathering resistance.

3.3.8.1 White paint. When the paint is tested as specified in 4.3.5, the paint film shall show no more than very slight chalking (chalk rating not lower than 9) and no other film defect. The film shall not darken more than two units as determined from the daylight directional reflectance. The yellowness index shall be not more than 0.08.

3.3.8.2 Tinted paints. When tested an in 4.3.5, the paint film shall show no chalking and no other film defect. The lightness index difference shall not exceed 0.7.

3.3.9 Fungus resistance. When tested as specified in table II, the paint shall show no fungus growth. Any suitable fungicide in accordance with industry's latest practices may be used provided the paint meets all requirements specified herein.

TABLE II. Tests and Methods

Characteristics	Paragraph Reference	Applicable Test	
		Fed. Test Method Std. No. 141	Requirement Reference
Condition in container	3.3.1	3011	-----
Weight per gallon	Table I	4184	-----
Total solids, percent by weight of paint	Table I	4041	-----

Drying time	Table I	4061	-----
Dry opacity	Table I	4121	-----
Storage stability	3.3.11	3021, 3022	-----
Color	3.3.2	4250	-----
Daylight directional reflectance[1]	Table I	6121	-----
Viscosity	Table I	4281	-----
Fineness of grind	Table I	4411	-----
Titanium dioxide pigment[2]	Table I	7081	-----
Lead content	Table I	----	4.3.7

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[1] Apply the paint to a substrate having a minimum reflectance of 80 percent.

[2] Determine the amount of titanium dioxide in the pigment, the pigment content of the paint, and the weight per gallon of paint as specified. Calculate the pounds of titanium dioxide pigment per gallon of white paint as follows:

Titanium dioxide pigment in pounds per gallon of white paint =

$$\frac{(A) \times (B) \times (C)}{0.80}$$

Where A = percentage of titanium dioxide in pigment, by weight.

B = percentage of pigment in paint, by weight.

C = weight of paint in pounds per gallon.

Less than 2.5 pounds of titanium dioxide pigment per gallon of white paint or 1.7 pounds of titanium dioxide pigment per gallon of tinted paint (under 80 percent reflectivity) shall constitute failure of this test.

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TABLE II. Tests and Methods (Cont'd)

Characteristics	Paragraph Reference	Applicable Test	
		Fed. Test Method Std. No. 141	Requirement Reference
Scrub resistance[3]	Table I	----	4.3
Gloss specular 60 deg.	Table I	6101	-----
Fungus resistance	3.3.9	----	4.3.8
Total vehicle solids	Table I	----	4.3.1.8.1
Alkyd resin	Table I	----	4.3.8.3 and 4.3.1.5
Flexibility	3.3.3	6221	4.3.6
Zinc oxide pigment	Table I	7091	-----
Working properties	3.3.4	----	4.3.4
Appearance	3.3.5	----	4.3.4
Odor	3.3.6	4401	-----
Recoating	3.3.7	----	4.3.4
Accelerated weathering	3.3.8	6411	4.3.5
Fungus	3.3.9	----	4.3.7
Freeze-thaw stability	3.3.10.1	----	4.3.2
Heat stability	3.3.10.2	----	4.3.3

[3] Use ASTM Method D 2486.

#### 3.3.10 Temperature stability.

3.3.10.1 Freeze-thaw stability. When tested as specified in 4.3.2, the paint shall show no breaking of the emulsion, coagulation, or change in consistency greater than 5 K. U., and no decrease in scrub resistance.

3.3.10.2 Heat stability. When tested as specified in 4.3.3, the paint shall show no coagulation and no change in consistency greater than 5 K. U.

#### 3.3.11 Storage stability.

3.3.11.1 Partially full container. The paint when tested as in 4.3.9.1 shall not skin within 48 hours. After storage for 30 days as described in 4.3.9.1 the paint shall show no skinning, livering, curdling, settling or hard caking that cannot be readily remixed to a smooth homogeneous state.

3.3.11.2 Full container. When tested an in 4.3.9.2 the paint shall show no skinning, livering, curdling, hard and dry caking or tough gummy sediment. The paint shall remix readily to a smooth homogeneous state, there shall be no change in drying time the consistent change shall be within plus or minus 10 of the original (see table I). There shall be no rusting of the container or deterioration of the content. A certificate of compliance to these effects is acceptable.

### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified 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.

## 4.2 Quality conformance inspection.

4.2.1 Sampling and inspection. Sampling and inspection shall be in accordance with methods 1011, 1021, and 1031 of Fed. Test Method Std. No. 141, as applicable.

4.3 Tests. Samples selected in accordance with 4.2.1 shall be tested as specified in table II and 4.3.1 through 4.3.5. Nonconformance to the requirements of the applicable test methods or failure to pass any test shall be cause for rejection of the lot which the sample represents.

### 4.3.1 Analysis (latex resin, alkyd resin, and pigment).

#### 4.3.1.1 Apparatus.

Centrifuge. International centrifuge, size 2, model V, head no. 240 spectrophotometer. Beckman model IR 8 or equivalent has been found satisfactory.



Rock salt discs for use in spectrophotometer.

100-ml centrifuge tubes with lip.

Appropriate shields for centrifuge tubes.

Soxhlet extraction apparatus - 500-ml erlenmeyer flasks 24/40 neck.

Hot plates.

Large vacuum desiccators.

Electric furnace capable of heating to 400 deg. C.

Vacuum oven.

Drying oven.

Steam bath.

#### 4.3.1.2 Reagents.

Sodium chloride, reagent grade.

Hexane, technical grade.

Nitrogen gas.

Indicator-type Drierite.

Acetone, reagent grade.

4.3.1.3 Determination of alkyd modifier and additives (n-Hexane extractables). Weigh, by difference, 15 to 20g of well-mixed sample accurately (+/-1) mg using a weight bottle and add to 100g of sodium chloride C.P. which has been moistened with 7 ml of distilled water, contained in a 500-ml glazed porcelain casserole. Mix well and place in a vacuum desiccator over indicator type Drierite. Dry over night or 16 hours with pump running.

Note 1. Moistening the salt with water before addition of the latex paint facilitates dispersion of the paint and subsequent grinding of the dried material.

Note 2. It was found that vacuum drying of the paint-salt mixture was necessary to prevent absorption of oxygen by the alkyd modifier, which would render it insoluble and make extraction impossible.

Grind the salt-paint mixture in a mortar and transfer to a 43 x 123 mm Soxhlet extraction cup and cover with a plus of glass wool. Extract with 400 ml of technical grade hexane under vigorous reflux for 4 hours. Use a Soxhlet extraction apparatus equipped with a calcium chloride tube and a few Berl saddles as boiling stones in the 500-ml erlenmeyer flask.

At the conclusion of the extraction period, remove the extraction thimble and rinse with hexane. Save the extraction thimble and contents for use in infrared identification of resin. See 4.3.1.7 Rinse the Soxhlet with hexane and transfer extract and rinsings to a tared 400-ml beaker containing Berl saddles. Rinse out any residue from the flask or saddles with benzene and add to the extract. Evaporate on a cooler portion of the steam bath under a light stream of nitrogen. When all of the solvent has evaporated, dry in a

vacuum oven at 60-70 deg/ C to constant weight. This required overnight (16 hour drying). Weigh beakers and determine the hexane extract.

4.3.1.4 Calculation. Calculate the percent alkyd modifier and additives in the sample as follows:

$$\text{Alkyd modifier and additives, percent} = \frac{Y \times 100}{Z}$$

Where Y = Net weight of hexane extract.

Z = Weight of paint sample.

From the percent alkyd modifier determined above and the percent total extractables (see 4.3.1.8 and 4.3.1.8.1) calculate the percent alkyd resin in the total vehicle solids.

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4.3.1.5 Identification of alkyd resin. Dissolve the hexane extract (see 4.3.1.3) in benzene and add a few drops of the solution to a sodium chloride disc. Dry at 60 deg. C for 30 minutes. When the film is of adequate thickness as seen by a trial infrared spectrum confirm the presence of an alkyd by comparing with published spectra or alkyd resins. Although the presence of additives may alter the infrared spectrum somewhat, the presence of characteristic alkyd absorbance bands will be apparent. These generally occur at 3.4, 3.5, 5.8, 6.2, 6.7, 6.9, 7.3, 7.8, 8.9 [ $\mu$ ]m.

4.3.1.6. Preparation of latex resin solution for infrared identification. Allow the hexane to evaporate from the extraction thimble. Drain the Soxhlet to remove any residual hexane. Extract the residue in the thimble with 400-ml of acetone under vigorous reflux for two hours, using the same apparatus as for the hexane extraction. Remove the extraction thimble and evaporate the acetone extract to a concentrated solution on the steam bath.

Note 3. The purpose of the above procedure is to obtain the latex resin free from the alkyd modifier which would make identification difficult if not impossible.

4.3.1.7 Identification of latex resin from vehicle. Apply a few drops of the acetone extract from 4.2.1 to a sodium chloride disc and dry at 60 deg. C for 30 minutes. When the film is of adequate thickness as seen by a trial infrared spectrum, identify the latex resin by comparing with published spectra of acrylic resins.

4.3.1.8 Determination of latex resin and alkyd (total extractables). Weigh 5g of well-mixed paint sample, weighing to the nearest mg., into a 100-ml centrifuge tube with lip. Mix well and dilute with distilled water to 80 ml. Centrifuge at 2000 rpm for 30 minutes. Decant, to appearance of the first streaks of pigment, (usually at the 15 ml level in the centrifuge tube), into a tared 400-ml beaker with Berl saddles. Sometimes it is possible to swirl or let pigment settle and decant more supernatant into the 400-ml beaker until streaks of pigment again appear.

Mix remaining pigment well by smearing against sides of centrifuge tube. When completely homogeneous, mix with water and dilute to 80 ml. Centrifuge at 2000 rpm for 30 minutes. Decant into the same 400-ml beaker. Streaks of pigment usually appear at 5-7 ml the second time.

Mix the remaining pigments as before and dilute to 30 ml with water. Add boiling acetone with stirring to 80 ml and centrifuge at 2000 rpm for 30 minutes. Decant as before. Repeat extraction with water-acetone.

Extract the remaining pigment twice with boiling acetone, centrifuging at 1500 rpm for 15 minutes and decanting as before.

Evaporate the combined extracts on the steam bath to dryness and dry in a regular oven at 100-105 deg C, to constant weight (approximately 16 hours). Weigh beakers and determine total weight of the extractables. In some cases, the separation of latex and alkyd from pigment will not be clean-cut. In the case of tinted or deep-tone paints, the extract will also contain the organic pigment. Ash the extract in a muffle furnace at 400 deg. C to constant weight. This may take up to 4 hours. Subtract the weight of ash from that of the extract.

4.3.1.8.1 Calculations. Calculate the total extractables in the sample as follows:

Total extractables, percent =  $W \times 100$  - total vehicle solids.

Where W = Weight of extract or weight of extract - Ash.  
Z = Weight of paint sample.

4.3.1.8.2 Calculation. Calculate the percent latex resin in the paint sample as follows:

Latex resin, percent = Total extractables, percent - n-hexane extractables, percent.

4.3.1.9 Determination of pigment content. Dry the 100-ml centrifuge tubes from the total extract in an oven at 100-105 deg. C to constant weight.

4.3.1.9.1 Calculation. Calculate the pigment content of the sample as follows:

$$\text{Pigment, percent} = \frac{V \times 100}{Z}$$

Where: V = Weight of pigment.  
Z = Weight of paint sample

4.3.2 Freeze-thaw stability. Nearly fill a one pint container with the paint, close the container, invert, and place in a cold chamber maintained at a temperature of 0 deg. F. (+/- 2 deg. F.). Remove the container after 16 hours of conditioning at 0 deg. F. and then condition at room temperature for 8 hours. Repeat this procedure four more times. At the completion of the five freeze-thaw cycles, mix the paint thoroughly with gentle stirring and examine for smoothness and uniformity. Perform the scrub resistance test specified in table II using the same panels, recleaned, that were used to determine the original wet abrasion resistance.

4.3.3 Heat stability. Nearly fill a one pint container with the paint, close the container, seal with tape, and place in an oven maintained at 140 deg. F. +/- 2 deg. F. for 1 week. Upon cooling of the paint to room temperature, mix the paint thoroughly with gentle stirring and examine for excessive thickening, discoloration, and freedom from lumps and coarse particles.

4.3.4 Application properties, appearance, and odor. Apply one coat of exterior wood primer (MIL-P-28582) or TT-P-25 at a spreading rate of 450 square feet per gallon to three wood panels and allow to dry for 72 hours or more. The wood panels should be conventional wood siding of redwood, red cedar, or pine about 3 feet in length. Brush one coat of the latex paint on one primed panel, roller coat the second panel, and spray apply the third panel with latex paint all at a spreading rate of about 600 square feet per gallon. In each case note ease of application and freedom from streaks and foaming. After 1 hour of air drying, apply a second coat in the same manner as the first coat. During application, examine the paint film for picking and rolling up of the first coat. After 24 hours inspect the dry film for a smooth, uniform appearance as described in 3.3.5. Observe also for odor as in 3.3.6.

4.3.5 Accelerated-weathering resistance. Prepare test panels by applying the paint by brushing at a spreading rate of 250 square feet per gallon to both sides and the edges of panels cut to appropriate size from asbestos shingles conforming to SS-B-346, type I. Apply two coats allowing 24 hours drying between coats and 72 hours before testing. Using the painted unglazed panels as the test surface, measure and record the daylight directional reflectance in accordance with Fed. Test Method Std. No. 141, method 6121, before and after 300 hours exposure to accelerated weathering in accordance with Fed. Test Method Std. No. 141, method 6151. For tinted paint, determine the values of directional reflectance before and after 300 hours of accelerated weathering.

After the accelerated weathering, examine all panels for chalking (method 6411) and other film defects. Determine the extent of change in reflectance and yellowness for whites and the color change for tinted paints. Color change and yellowness shall be determined in accordance with Fed. Test Method Std. No. 141, methods 6122 and 6131 respectively. Nonconformance to the requirements specified in 3.3.8 shall constitute failure of this test.

4.3.6 Flexibility. Prepare the test panel in accordance with method 2012. Supplement the test panel cleaning procedure with an additional cleaning with abrasive soap (such as Bon Ami or equal) so that the entire surface of the panel in water wet. Apply the paint in accordance with method 2162 on the clean, dry panel with a 0.002-inch (approximately 0.004-inch gap clearance Bird film applicator or similar blade which produces the same film thickness. Air dry for 18 hours, bake for 3 hours at 105 deg. +/- 2 deg. C. Cool for 1/2 hour, bend over 1/8-inch mandrel and examine in accordance with method 6221 for compliance with 3.3.3.

4.3.7 Lead content. Determine lead content in accordance with ASTM Method D 3335 for compliance with table I.

4.3.8 Fungus resistance. Determine fungus growth resistance in accordance with ASTM method D 3273.

4.3.9 Storage stability.

4.3.9.1 Partially full container. Determine skinning after 48 hours in accordance with method 3021 of Fed. Test Method Std. No. 141 except use a 3/4 filled 1/2-pint multiple friction top can. Reseal and store for 30 days then examine for compliance with 3.3.1.1.1.

4.3.9.2 Full container. In accordance with method 3022 of Fed. Test Method Std. No. 141, allow a full standard quart can of the paint to stand undisturbed for 12 months then examine the contents and the container. Agitate for 5 minutes on the paint shaker prior to reexamination. Then observe for compliance with 3.3.11.2.

4.4 Inspection of preparation for delivery. The packaging, packing, and marking of the containers shall be examined and tested to determine compliance with the requirements of section 5.

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## 5. PREPARATION FOR DELIVERY

5.1 Packaging, packing, and Marking. The paint shall be packaged, packed, and marked in accordance with TT-P-143. Packaging shall be level A, B, or C and packing shall be level A, B, or C, as specified (see 6.2). The paint shall be furnished in the size of container specified (see 6.2).

## 6. NOTES

6.1 Intended use. The alkyd modified acrylic latex paint covered by this specification is for use on exterior wood surfaces such as house siding. It is especially useful in repainting weathered painted surfaces showing not more than a moderate degree of chalk. Heavy chalk should be removed by brushing or washing before this paint is applied. All other regular surface preparation procedures including mildew removal must also be followed. New wood surfaces and bare or thin areas encountered in repainting operations should be coated with a lead free pigment wood primer such as MIL-P-28582 or TT-P-25 prior to application of the latex paint. An with all products of this type, the ambient temperature should be not lower than 50 deg. F. at the time of 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) Color required (see 3.3.2).
- (c) Level of packaging and level of packing required (see 5.1).
- (d) Size of container required (see 5.1).

6.3 Basic of purchase. The paint should be purchased by volume, the unit being a gallon of 231 cubic inches. Paint temperature shall not be in excess of 20 deg. C (68 deg. F.) at time of volume measurement.

6.4 Suitable tinting pigments. Suitable tinting pigments include the following: red, brawn, and black iron oxides, chromium oxide, phthalocyanine green, phthalocyanine blue, nickel azo yellow, and hansa yellow.

CIVIL AGENCY COORDINATING ACTIVITY:

Preparing activity:

COM - NBS  
GSA - FSS

GSA - FSS

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 30 cents each.

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 AMENDMENT-1  
 June 23, 1977

FEDERAL SPECIFICATION

PAINT, LATEX, EXTERIOR, FOR WOOD SURFACES,  
 WHITE AND TINTS

This amendment, which form a part of Federal Specification TT-P-1510A, dated January 3, 1975. was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

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Under Federal Specifications.

Change "TT-P-143" to "PPP-P-1892"

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

Delete: D 3335 - Determination of Low Concentrations of Lead in Paint  
 by Atomic Absorption Spectrometry.

Add: D 34 - Chemical Analysis of White Pigments.  
 D 562 - Test for Consistency of Paints Using the Stomer Viscosimeter.  
 D 659 - Evaluating Degree of Chalking of Exterior Paints.  
 D 1210 - Test for Fineness of Dispersion of Pigment-Vehicle System.  
 D 1296 - Test for Odor of Volatile Solvents and Diluents.  
 D 1475 - Test for Density of Paint, Varnish, Lacquer and Related  
 Products.  
 D 2369 - Volatile Content of Paints.  
 D 2486 - Scrub Resistance of Interior Latex Flat Wall Paints.  
 D 3273 - Resistance to Growth of Mold on the Surface of Interior  
 Coatings in an Environmental Chamber.  
 E 97 - Test for 45-Degree, 0-Degree, Directional Reflectance of  
 Opaque Specimens by Filter Photometry.

Table I, line 6. Under "maximum", change "0.5" to "0.06".

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Table II. Delete and substitute:

TABLE II. Tests and methods

Characteristics	Paragraph Reference	Applicable Test		
		Fed. Test Method Std. No. 141	ASTM Method	Requirement Reference
Condition in container	3.3.1	3011	----	-----
Weight per gallon	Table I	----	D 1475	-----
Total solids, percent by weight of paint	Table I	----	D 2369	-----
Drying time	Table I	4061	----	-----



Dry opacity	Table I	4121	----	-----
Storage stability	3.3.11	3021, 3022	----	-----
Color	3.3.2	4250	----	-----
Daylight directional reflectance[1]	Table I	----	E 97	-----
Viscosity	Table I	----	D 562	-----
Fineness of grind	Table I	----	D 1210	-----
Titanium dioxide pigment[2]	Table I	7081	----	-----
Lead content	Table I	----	----	4.3.7
Scrub resistance	Table I	----	D 2486	-----

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TABLE II. Tests and method (con.)

Characteristics	Paragraph Reference	Applicable Test		Requirement Reference
		Fed. Test Method Std. No. 141	ASTM Method	
Gloss specular 60 deg.	Table I	6101	----	-----
Fungus resistance	3.3.9	----	D 3273	4.3.8
Total vehicle solids	Table I	----	----	4.3.1.6.1
Alkyd resin	Table I	----	----	4.3.8.3 and 4.3.1.5
Flexibility	3.3.3	6221	----	4.3.6
Zinc oxide pigment	Table I	----	D 34	-----
Working properties	3.3.4	----	----	4.3.4
Appearance	3.3.5	----	----	4.3.4
Odor	3.3.6	----	D 1296	-----
Recasting	3.3.7	----	----	4.3.4
Accelerated weathering	3.3.8	----	D 659	4.3.5
Fungus	3.3.9	----	----	4.3.7
Freeze-thaw stability	3.3.10.1	----	----	4.3.2
Heat stability	3.3.10.2	----	----	4.3.3

[1] Apply the paint to a substrate having a minimum reflectance of 80 percent.

[2] Determine the amount of titanium dioxide in the pigment, the pigment content of the paint, and the weight per gallon of paint as specified. Calculate the pounds of titanium dioxide pigment per gallon of white paint as follows:

Titanium dioxide pigment in pounds per gallon of white paint =

$$\frac{(A) \times (B) \times (C)}{0.80}$$

Where A = percentage of titanium dioxide in pigment, by weight.

B = percentage of pigment in paint, by weight.

C = weight of paint in pounds per gallon.

Less than 2.5 pounds of titanium dioxide pigment per gallon of white paint or 1.7 pounds of titanium dioxide pigment per gallon of tinted paint (under 30 percent reflectivity) shall constitute failure of this test.

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Paragraph 4.3.5, lines 5 and 6. Delete "Fed. Test Method Std. No. 141, Method 6121" and substitute "ASTM Method E 97".

Paragraph 4.3.7, Delete in its entirety and substitute:

4.3.7 Lead content.

4.3.7.1 Sample preparation. Using a 0.006-inch film applicator and a mechanical 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.

4.3.7.2 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]

Element	Analytical Line	Angle	Crystal	Detection	Collimeter	X-ray tube (110)
Pb	J	33.93	LiF(200)	Flow S.C.	Fine	60Kv 45Ma
Pb (backgrd 1)		33.00	LiF(200)	Flow S.C.	Fine	60Kv 45Ma
Pb (backgrd II)		35.50	LiF(200)	Flow S.C.	Fine	60Kv 45Ma
Mo	K	20.33	LiF(200)	Flow S.C.	Fine	60Kv 45Ma

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

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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 the Molybdenum Compton scattered background from the X-ray tube.

## 4.3.7.3 Calculation.

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

$$\frac{I_{Mo}}{I_{Mo}}$$

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

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Paragraph 5.1, line 2. Change "TT-P-143" to "PPP-P-1892".