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TT-V-119D
July 6, 1973
SUPERSEDING
Int. Fed. Spec. TT-V-00119C(GSA-FSS)
February 1, 1972 and
Fed. Spec. TT-V-119B
February 20, 1968

FEDERAL SPECIFICATION

VARNISH, SPAR, PHENOLIC-RESIN

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. The vanish covered by this specification is a clear, air-drying spar varnish of the phenolic-resin type.

1.2 Classification.

1.2.1 Grade. This specification covers one grade only of phenolic-resin spar varnish.

2. APPLICABLE DOCUMENTS

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

Federal Specifications:

TT-D-376 - Dipentene, Technical: (For Use in Organic Protective Coatings).
TT-D-643 - Drier, Paint, Naphthenate, Liquid, Concentrated.
TT-P-143 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing, and Marking Of.
TT-P-320 - Pigment, Aluminum; Powder and Paste, for Paint.
TT-P-636 - Primer Coating, Alkyd, Wood and Ferrous Metal.
TT-R-271 - Resin, Phenol-Formaldehyde, Para-Phenyl.
TT-T-291 - Thinner; Paint. Volatile Spirits (Petroleum-Spirits).
TT-T-775 - Tung Oil, Raw (China Wood) (For Use in Organic Coatings).
TT-S-735 - Standard Test Fluids; Hydrocarbon.
JJJ-C-86 - Caster Oil, Technical.

Federal Standard:

Fed. Test Method Std. No. 141/Gen. - Paint, Varnish, Lacquer and related Material; Methods of Inspection, Sampling, and Testing.

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

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(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.)

3. REQUIREMENT

3.1 Quantitative requirements. The varnish shall conform to the quantitative requirements specified in tables I and II.

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TABLE I. Composition

Characteristics	Percent by weight Minimum	Maximum	Ingredient specification
Product:			
Nonvolatile	57	--	
Volatile	--	43	
Nonvolatile (33-gallon length):			
in; phenol-formaldehyde	28		TT-R-271
Oil; tung (china-wood), raw	45		TT-T-775
Oil; castor	2	4	JJJ-C-86
Oil; linseed, alkali-refined		As required	[1]
Driers; naphtenate		As required	TT-D-643 [2]
Volatile:			
Solvent blend*	25		
Mineral spirits		75	TT-T-291, type II, grade A
Anti-skinning agent		As required	[3]

[1] Acid number not to exceed 1.5 minimum iodine number of 170 required.
[2] The drier shall be a mixed soluble naphthenate of lead, cobalt and manganese. Zinc naphthenate may be used in sufficient quantity to assure freedom from wrinkling when the product is used after extended aging in the package.
[3] Anti-skinning agents may be used to meet the non-skinning requirement provided the finish product meets all the requirements.
* The solvent blend shall comply Rule 66. A certified statement to this effect is necessary. The manufacturer is given latitude in selection of solvent blend provided the finish product complies with all the requirements and an excellent solvent for both phenolic resins and drying oils.

TABLE II. Quantitative requirements.

Characteristics	Requirements Minimum	Maximum
Viscosity, Garner-Holdt tubes	C	F
Weight per	7.3	--
Ash, percent by weight	--	0.5
Flash point (closed cup), *F.	80	--
Drying time:		
Set-to-touch, hours	1	2-1/2
Dry-hard,	--	8
Free from tack, hours	--	24
Rosin-pentaerythritol Ester Reduction, percent	120	--

3.2 Qualitative requirements.

3.2.1 Appearance. The vanish shall be clear, transparent, and homogeneous when tested as in 4.3.2.

3.2.2 Odor. The odor shall be normal for the volatiles permitted by the specification when tested as in 4.3.3.

3.2.4 Color. The varnish shall be not darker in color than a solution of 0.763 gm. of reagent-grade potassium dichromate in 100 ml. of concentrated sulfuric acid (sp. gr. 1.84) when tested as in 4.3.4. The No. 14 tube of the Gardner color sale and the No. 7L Standard of the Hellige Color Comparator may

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be used as secondary standards.

3.2.4 Compatibility with zinc oxide pigment. The varnish when milled with zinc oxide and tested as specified in 4.3.5 shall show not more than 10 K.U. increase in viscosity after aging 5 days in a tightly closed full can.

3.2.5 Skinning. The varnish shall not skin within 48 hours in a three-quarter filled closed container.

3.2.6 Working properties and appearance of dried film. When applied by brushing or spraying, varnish shall be a freely working product with acceptable flowing and leveling properties. The air-dried film shall be clear, smooth, and glossy, and free from streaks, blisters, and other irregularities when tested as in 4.3.6.

3.2.7 Self-lifting properties. Recoating two separate panels after 5 and 18 hours, respectively, shall produce no film irregularity when the second coats have been dried as specified in 4.3.7.

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3.2.8 Baking properties. A drawdown film of the varnish prepared and baked as specified in 4.3.7 shall be hard, tough, smooth, transparent, and free from all defects as checking, wrinkling, dulling, and discoloration.

3.2.9 Hot-water resistance. A drawdown film of the varnish prepared and tested as specified in 4.3.8 shall show no whitening, dulling, or other visible defects when observed five minutes after removal from the water. After 18 hours recovery the test film shall be equal in hardness toughness, gloss, and adhesion to a similarity prepared film not subjected to the test.

3.2.10 Hydrocarbon. A drawdown film of the varnish prepared and tested as specified in 4.3.9 shall be equal in hardness, toughness, gloss, and adhesion, 36 hours after removal, to a similarly prepared film not subjected to the test.

3.2.11 Alkali resistance. An air-dried film of the varnish when prepared and tested as specified in 4.3.10 shall show no dulling, checking, or blistering 2 hours after removal.

3.2.12 Gas-proofness. The dried film shall show no pitting, wrinkling, crow's footing, or other defects when subjected to the draft test as in 4.3.11.

3.2.13 Draft-proofness. The dried film shall show no pitting, wrinkling, crow's footing, or other defects when subjected to the draft test as in 4.3.12.

3.2.14 Rosin and rosin derivatives. The varnish shall contain no rosin or rosin derivatives when tested as in 4.3.13.

3.2.15 Aluminum vehicle properties. An aluminum paint made with the varnish, aluminum pigment, and mineral spirits conforming to TT-T-291, type II Grade A as specified in 4.3.14 shall conform to the following requirements:

3.2.15.1 Spraying and brushing properties. When applied by spraying or brushing the paint shall be a freely working product with acceptable flowing and leveling properties.

3.2.15.2 Leafing properties and pigment distribution. A spray coat of the paint when applied to clear glass as specified in 4.3.14.3 shall show satisfactory leafing properties and uniform pigment distribution.

3.2.15.3 Drying time. A brush coat of the paint applied to steel shall set to touch in not more than 2-1/2 hours and dry hard in 8 hours.

3.2.15.4 Coating anchorage. A brush coat of the paint applied over a primed steel panel prepared as specified in 4.3.14.5 shall not be capable of separation from the primer by means of a diagonally applied knife or razor blade.

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, 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 services conform to the prescribed requirements.

4.1.1 Classification of inspection.

4.1.2 Inspection. Inspection shall be classified a follows:

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(a) Production inspection of the varnish.
(b) Inspection of preparation for delivery.

4.2 Production inspection.

4.2.1 Sampling and inspection. Sampling and inspection shall be in accordance with Fed. Test Method Std. No. 141, method 1031.

4.3 Test procedures. The varnish shall be tested in accordance with the following applicable methods of Fed. Test Method Std. No. 141 as indicated in table III and as hereinafter specified.

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TABLE III. Index

Characteristic	Requirements reference	Application Test Fed. Test Method Std. No 141	Paragraph reference
Ash content	Table II	5262	---
Flash point	Table II	4291	---
Viscosity	Table II	4271	---
Weight per gallon	Table II	4011	---
Drying time	Table II	4061	---
Appearance	3.2.1	4261	4.3.2
Odor	3.2.2	----	4.3.3
Color	3.3.3	----	4.3.4
Compatibility	3.3.4	----	4.3.5
Skinning	3.3.5	3021	---
Working properties	3.3.6	----	4.3.6
Self-lifting properties	3.3.7	----	4.3.7
Baking properties	3.3.8	----	4.3.7
Hot water resistance	3.3.9	----	4.3.8
Hydrocarbon resistance	3.3.10	----	4.3.9
Alkali resistance	3.3.11	----	4.3.10
Gas proofness	3.3.12	----	4.3.11
Draft proofness	3.3.13	----	4.3.12
Rosin and rosin derivatives	3.3.14	----	4.3.13
Spraying and brushing properties	3.2.15.1	----	4.3.14.2
Leafing properties	3.2.15.2	----	4.3.14.3
Drying time	3.2.15.3	----	4.3.14.4
Coating anchorage	3.2.15.4	----	4.3.14.5

4.3.1 Ingredient materials. When requested by the procuring agency, tests of ingredient materials shall be made to determine compliance with the requirements of the applicable specifications listed in table I. The acid number of the alkali-refined linseed oil shall be determined in accordance with method 5071 of Fed. Test Method Std. No. 141.

4.3.2 Appearance. Determine the appearance of the varnish in accordance with method 4261 of Fed. Test Method Std. No. 141 for compliance with 3.2.1.

4.3.3 Odor. The odor of the varnish shall be determined in accordance with method 4401 of Fed. Test Method Std. No. 141 for compliance with 3.2.2.

4.3.4 Color. Compare the color of the varnish in accordance with method 4241 of Fed. Test Method Std. No.141 and determine for compliance with 3.2.3 or method 4242 as an alternate method.

4.3.5 Compatibility with zinc oxide pigment.

4.3.5.1 Reagent. The zinc oxide shall conform to the following requirements:

Type	American process
Particle shape	Acicular as evaluated by microscope
Zinc oxide, minimum percent	98.5
Sulfur, maximum, percent	0.25
Impurities, including moisture, maximum, percent	1.5
Coarse particles (No. 325 sieve), maximum, percent	0.2
Oil absorption	21 to 25
Apparent density, maximum, pounds	

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per cu. ft. 12

4.3.5.2 Procedure. To an appropriate weight of the varnish (approximately 1 pint will be sufficient) add zinc oxide in an amount equal to the weight of the nonvolatile portion of the varnish taken. Mix with the aid of a suitable mechanical mixer for 3 minutes. Then pass the resultant paste immediately over a laboratory three-roll mill (water-cooled), using three passes to insure smooth paste free from coarse, unground aggregates. Immediately reduce the resulting paste to a viscosity of 80 +/- 1 K.U. with mineral spirits conforming to grade A of TT-T-291, type II. Determine the viscosity by method 4281 of Fed. Test Std. No. 141. Store the paint in a tightly closed full can and determine the viscosity after 5 days storage. Evaluate for compliance with 3.2.4.

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4.3.6 Working properties and appearance of dried film. Observe whether the varnish works, flows, and levels satisfactorily during the application of the test films by brushing or spraying and examine the air-dried films for clearness, smoothness, glossiness, and freedom from streaks, blisters, and other irregularities. Evaluate for compliance with 3.2.6.

4.3.7 Baking properties. Apply a film of the varnish having a wet-film thickness of 0.0015 +/- 0.0002 inch to a clear glass panel (method 2021), using a Bird film applicator or any other doctor blade capable of producing the specified wet-film thickness. All to air-dry in a horizontal position for 30 minutes, and then bake in a horizontal position at 63 deg. to 68 deg. C. (145 deg. to 154 deg. F.) for 2 hours. Remove from oven, cool for 1 hour at room temperature, and examine for hardness, toughness, smoothness, and transparency. Examine also for freedom from checking, wrinkling, dulling, and for appreciable discoloration in comparison with a freshly prepared unbaked film. Determine for compliance with 3.2.8.

4.3.8 Hot-water resistance. Draw down a film of the varnish as specified in 4.3.7 on a tin panel (method 2012). Allow the film to air-dray in a horizontal position for 48 hours. Place the panel with the film in an uppermost position in a beaker of boiling water (method 6011). Maintain the water at a gentle boil and constant level for 7 hours. Remove the panel and examine for conformance to the requirements of 3.2.9. (After removal from the water, the film may be lightly sponged with a pad of cheesecloth or cotton to remove any surface material.) Then determine for compliance with 3.2.9.

4.3.9 Hydrocarbon resistance.

4.3.9.1 Reagent. The reagent shall be standard test fluid conforming to TT-S-735, types I and III.

4.3.9.2 Procedure. Draw down a film of the varnish as specified in 4.3.7 on a tin panel (method 2012). Allow the film to air dry in a horizontal position for 48 hours. Place the panel in a container of the reagent (method 6011). Remove the panel after 4 hours exposure. Examine the film 24 hours after removal for conformance to the requirements of 3.2.10.

4.3.10 Alkali resistance. Dip the closed end of a well-cleaned 1-by 6-inch test tube to a depth of 4 inches into the varnish to be tested and allow to dry in an inverted position that is, with the mouth of the test tube down, for 72 hours. Place the end of the test tube which was uppermost during the drying period 2 inches below the surface of a 5 percent aqueous solution of sodium hydroxide previously adjusted to and maintained at a temperature of 20 deg. +/- 0.5 deg. C. (68 deg. +/- 1.0 deg F.) for 7 hours. Remove and immediately rinse under gently running tap water, holding near the mouth of the tube and being careful not to touch the exposed film. Dry for 2 hours and then examine for conformance to the requirements of 3.2.11. Defects at the extreme bottom of the test tube shall be disregarded.

4.3.11 Gas-proofness. Determine the gas test in accordance with method 4161 or 4162 of Fed. Test Method Std. No. 141 for compliance with 3.2.12.

4.3.12 Draft-proofness. Draft test shall be conducted in accordance with method 4171 of Fed. Test Method Std. No. 141 for compliance with 3.2.13.

4.3.13 Rosin and rosin derivatives. Examine the material for rosin and rosin derivatives in accordance with method 5031 of Fed. Test Method Std. No. 141 for compliance with 3.2.14.

4.3.14 Aluminum vehicle properties.

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4.3.14.1 Preparation of aluminum test paint. Prepare an appropriate quantity of aluminum paint by mixing the ingredients in the following ratio: 1 gallon of varnish, 20 ounces of aluminum paste (TT-P-320, type II, class 2) and 1/5 gallon of mineral spirits (TT-T-291, type II, grade A). Add the mineral spirits slowly to the aluminum paste with constant stirring and stir frequently for a 15 minute period to insure complete wetting and dispersion of the pigment in the mineral spirits, and add the varnish with continuous stirring. Stir vigorously for at least 2 minutes and observe the surface of the paint for brilliance and uniformity for 1 minute after cessation of stirring. Allow the paint to stand for 2 hours, stir thoroughly, and run the following tests.

4.3.14.2 Spraying and brushing properties. Observe the working, flowing, and leveling properties of the paint, as it is applied by spray (method 4331) and brush (method 4321) to the glass, steel, and primed (TT-P-636) sub-strata, for conformance with the requirements of 3.2.15.1.

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4.3.14.3 Leafing properties and pigment distribution. Spray a coat of paint on a clear glass panel (method 2021). Allow the paint film to air-dry for 24 hours and examine by transmitted and reflected light for conformance with the requirements of 3.2.15.2.

4.3.14.4 Drying time. Apply a brush coat of the paint to a solvent-cleaned steel panel (method 2011) and determine the set-to-touch and dry-hard time as specified in 3.2.15.3.

4.3.14.5 Coating anchorage. Apply a medium spray coat of primer (TT-P-636) to 5- by 16-inch (or larger) solvent-cleaned steel panel (method 2011), air-dry for 1 hour, bake for 45 minutes at 120 deg. C. (250 deg. F.), and cool to room temperatures. Brush a coat of the paint over the primer and allow to air-dry for 24 hours. Using method 6171, determine whether the requirements of 3.2.15.4 for coating anchorage are met.

4.3.15 Inspection of preparation for delivery. The varnish shall be inspected for compliance with packaging, packing, and marking requirements of section 5.

5. PREPARATION FOR DELIVERY

5.1 Packaging, packing, and marking. The varnish 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 varnish shall be furnished in 1-pint can, 1-quart can, 1-gallon can or 5-gallon pail (see 6.2).

5.2 Special marking.

CAUTION. KEEP VARNISH AWAY FROM FLAMES. PROVIDE ADEQUATE VENTILATION DURING APPLICATION. THE FUMES FROM THIS VARNISH HAVE A FAINT ODOR WHICH MAY NOT BE READILY NOTICED.

Directions for use. This is a 33-gallon length, 100 percent oil-soluble phenolic-resin spar varnish of excellent exterior durability and water resistance. It may be used as marine spar varnish as well as a varnish for structural and architectural use. It dries rapidly to a smooth, lustrous, transparent finish. It may be mixed with aluminum powder or paste to give a protective finish coating for wood, metal, and doped fabrics, and as a sealing compound in the fabrication and repair of riveted aluminum alloy tanks. When used as a varnish on bare wood, three coats should be applied.

The vanish should be stored under good conditions (40 deg. to 90 deg. F.) and the estimated "shelf life" (closed containers) is one year.

6. NOTES

6.1 Intended use. The product covered by this specification is a clear, air-drying spar varnish of the phenolic-resin type. It is intended for use as a transparent and aluminized exterior protective finish coating for wood, metal, and doped fabric. It serves also as an aluminum vehicle for certain enamels and primers, and as a sealing compound in the fabrication and repair of riveted aluminum allow tanks.

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) Size of container required (see 5.1).

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(c) Levels of packaging and packing (see 5.1).

6.3 Basis of purchase. Varnish should be purchased by volume, the unit being a gallon 231 cubic inches at 15.5 deg. C. (60 deg. F). The volume may be determined by measure, or, in the case of large deliveries, it may be easier to determine the net weight and specific gravity at 15.5 deg./15.5 deg. C. (60 deg./60 deg. F) of the delivery. The weight per gallon in pounds can then be

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determined by multiplying the specific gravity by 8.33. The net weight in pounds divided by the weight per gallon gives the number of gallons.

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TT-V-119D
AMENDMENT -2
June 23, 1977
SUPERSEDING
Amendment-1
July 3, 1975

FEDERAL SPECIFICATION

VARNISH, SPAR, PHENOLIC-RESIN

This amendment, which forms a part of Federal Specification TT-V-119D, dated July 6, 1973, was approved by the Commissioner, Federal Supply Service, General Services Administration, for use of all Federal Agencies.

PAGE 1

Paragraph 2.1, under Federal Specifications, line 7 add "and para-tertiary butyl phenol."

Under Federal Specifications:

Delete "TT-D-643" in its entirety. And change "TT-P-143" to "PPP-P-1892".

Add paragraph 2.2 as follows:

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.

American Society for Testing and Materials (ASTM) Standards:

D 562 - Test for Consistency of Paints Using the Stormer Viscosimeter.
D 600 - Specification for Liquid Paint Driers.
D 1296 - Test for Odor of Volatile Solvents and Diluents.
D 1308 - Test for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
D 1475 - Test for Density of Paint, Varnish, Lacquer and Related Products.
D 1542 - Qualitative Tests for Rosin in Varnishes.
D 1545 - Test for Viscosity of Transparent Liquids by Bubble Time Method.
D 1639 - Test for Acid Value of Organic Coating Materials.
D 1643 - Test for Gas Checking and Draft Test of Varnish Films.
D 1653 - Test for Moisture Vapor Permeability of Organic Coating Films.
D 1951 - Test for Ash in Drying Oils and Fatty Acids.
D 3278 - Test for Flash Point of Liquids by Setaflash Closed Tester.

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

PAGE 2

Table I: under Characteristics, delete "33 gallon length" after Nonvolatile.

Table I: Oil, castor requirement delete "2 minimum and 4 maximum" and substitute "As required."

Table I: Oil, linseed add "or heat polymerized."

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Table II, under Characteristics, line 2 add "gallon lbs", after per and change minimum requirement "7.3" to "7.2". At end of table add: under Characteristics "Lead, percent nonvolatile, " under minimum "---", under maximum "0.06.".

Table I. Line 9, under "Ingredient specification" change "TT-D-643" to "ASTM D 600".

Table II. Line 2, add: "gallon, lbs". At end of table add: under characteristics "Lead, percent nonvolatile", under minimum "---", under maximum "0.06".

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Paragraph 4.3, line 1 and 2. Delete: "in accordance with the following applicable methods of Fed. Test Method Std. No. 141".

Table III. Delete and substitute:

TABLE III. Index

Characteristic	Requirement reference	Application Test Fed. Test Method Std. No 141	ASTM Method	Paragraph reference
Ash content	Table II	----	D 1951	---
Flash point	Table II	----	D 3278	---
Viscosity	Table II	----	D 1545	---
Weight per gallon	Table II	----	D 1475	---
Drying time	Table II	4061	----	---
Appearance	3.2.1	4261	----	4.3.2
Odor	3.2.2	----	----	4.3.3
Color	3.3.3	----	----	4.3.4
Compatibility	3.3.4	----	----	4.3.5
Skinning	3.3.5	3021	----	---
Working properties	3.3.6	----	----	4.3.6
Self-lifting properties	3.3.7	----	----	4.3.7
Baking properties	3.3.8	----	----	4.3.7
Hot water resistance	3.3.9	----	----	4.3.8
Hydrocarbon resistance	3.3.10	----	----	4.3.9
Alkali resistance	3.3.11	----	----	4.3.10
Gas proofness	3.3.12	----	----	4.3.11
Draft proofness	3.3.13	----	----	4.3.12
Rosin and rosin derivatives	3.3.14	----	----	4.3.13
Spraying and brushing properties	3.2.15.1	----	----	4.3.14.2
Leafing properties	3.2.15.2	----	----	4.3.14.3
Drying time	3.2.15.3	----	----	4.3.14.4
Coating anchorage	3.2.15.4	----	----	4.3.14.5
Lead content	Table II	----	----	4.3.16

Paragraph 4.3.1, line 4. Delete "method 5071 of Fed. Test Method Std. No. 141" and substitute "ASTM Method D 1639".

Paragraph 4.3.3, line 1. Delete "method 4401 of Fed. Test Method Std. No. 141" and substitute "ASTM Method D 1296".

Paragraph 4.3.5.2, line 7. Delete "Method 4281 of Fed. Test Method Std. No. 141" and substitute "ASTM Method D 562".

Paragraph 4.3.8, line 3. Delete "(Method 6011)" and substitute "ASTM Method D 1308, Sec. 5D".

Paragraph 4.3.9.1, line 2. Delete "and III".

Paragraph 4.3.9.2, line 3. Delete "(Method 6011)" and substitute "ASTM Method D 1308, Sec 5D".

Paragraph 4.3.11, line 1. Delete "Method 4161 or 4162 of Fed. Test Method

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Std. No. 141" and substitute "ASTM Method D 1643, Method A or Method B".

Paragraph 4.3.12, line 1. Delete "Method 4171 of Fed. Test Method Std. No. 141" and substitute "ASTM Method 1643, Sec. 10-14".

Paragraph 4.3.13, line 2. Delete "method 5031 of Fed. Test Method Std. No. 141" and substitute "ASTM Method 1542, Sec. 4A".

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Paragraph 4.3.14.5, line 4. Delete "Method 6171" and substitute "ASTM Method 6171".

Add new paragraphs:

4.3.16 Lead content.

4.3.16.1 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.

4.3.16.2 Procedure. Lead content shall be determined using an X-ray fluorescence spectrometer capable of determining lead content at 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 (MO)
Pb	L	33.93	LiF(200)	Flow S.C.	Fine	60Kv 45Ma
Pb (backgrd I)		33.00	LiF(200)	Flow S.C.	Fine	60Kv 45a
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

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 form the X-ray tube.

4.3.16.3 Calculation.

$$R = \frac{\llcorner I \lrcorner Pb - \dfrac{\llcorner I \lrcorner Pb\ (\text{Background I}) + \llcorner I \lrcorner Pb\ (\text{Background II})}{2}}{\llcorner I \lrcorner Mo}$$

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.

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

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