



## SECTION 1045

### PAINT FOR STRUCTURAL STEEL

**1045.1 Scope.** This specification covers paint, paint material and coating systems for use on structural steel.

#### **1045.2 Paint and Paint Material.**

**1045.2.1 General.** All single component paints shall be ready-mixed at the factory to comply with the specification formula for the type of paint ordered; shall be well ground to a uniform consistency and smooth texture; shall be free from dirt, water and other foreign matter; shall be of such consistency to have good application, covering and leveling properties; and shall dry within the specified period to a good film without running, streaking or sagging.

**1045.2.1.1** Any paint that has livered or hardened or thickened to any extent in the container, or in which the pigment has settled such that the paint cannot be readily broken up with a paddle to a smooth uniform paint of good application consistency, will be rejected.

**1045.2.1.2** All percentages and proportions shall be on a weight basis unless otherwise stated.

**1045.2.1.3** All VOC content requirements specified shall be a maximum when thinned for application.

**1045.2.2 Sampling.** Each batch or lot of paint shall be sampled and approved prior to use. Each batch or lot of each component of multiple-component paints shall be sampled and approved prior to use.

**1045.2.3 Packaging and Labeling.** The lining of the containers shall not react with the paint. All components shall bear a label on which shall be clearly shown the name of the manufacturer, the kind of paint, lot number, shelf life, date of manufacture and net weight of contents. The lot number and date of manufacture shall be stamped, stenciled or painted directly onto the container using a weatherproof, durable material.

**1045.2.4 Determination of Quantities.** Quantities of paint shall be determined by volume. One gallon shall equal 231 cubic inches at 77 F.

#### **1045.3 High Solids Inorganic Zinc Silicate Coating**

**1045.3.1 Description.** High solids inorganic zinc coating shall be a solvent base multiple-component material which, when mixed and applied in accordance with [Sec 1081](#), cures without the use of a separate curing solution. High solids inorganic zinc coating shall be in accordance with AASHTO M 300, Type IA. The VOC content shall not exceed 3.50 pounds per gallon. If thinning is necessary for application, the maximum VOC content after thinning shall not exceed 3.50 pounds per gallon.

**1045.3.2 Manufacturer and Brand Name Approval.** Prior to approval and use of high solids inorganic zinc, the manufacturer shall submit to Construction and Materials a certified test report from an approved testing laboratory showing specific test results conforming to all quantitative and resistance test requirements of these specifications. The certified test report

shall also contain the exact ratio, by weight, of each component of the coating used for the tests, the lot tested, the manufacturer's name, brand name of coating and date of manufacture. Upon approval from the engineer of this certified test report, further resistance tests will not be required, except as hereinafter noted, of that manufacturer for that brand name of coating. New certified test results shall be submitted any time the manufacturing process or the coating formulation is changed, and may be required by the engineer when sampling and testing of material offered for use indicates nonconformance to any of the requirements herein specified. All resistance testing shall be performed on duplicate sets of test panels, and upon completion of the prescribed exposure testing, the manufacturer shall submit one set of the exposed panels to Construction and Materials.

**1045.3.3 Alternate Approval.** If approved by Construction and Materials, compliance with all specified requirements for the system under NTPEP or Northeast Protective Coating Committee (NEPCOAT), in addition to the physical property requirements of this specification, may be substituted for the manufacturer and brand name approval requirements of [Sec 1045.3.2](#). The manufacturer shall provide documentation identifying specific products evaluated, along with the manufacturer's code numbers and/or report code numbers.

**1045.4 High Solids Epoxy System G Intermediate Coating.**

**1045.4.1 Description.** The coating shall be a multiple-component, modified epoxy primer with an amine/amide-type curing system compatible as an intermediate coat over high solids inorganic zinc primer and suitable for topcoating with polyurethane.

**1045.4.2 Mixed Coating.** The color shall be gray (Federal Standard 595b No. 26373) or brown (Federal Standard 595b No. 30045) unless otherwise specified. The color of the intermediate coat shall match the color of the finish coat, unless otherwise approved by the engineer. The physical properties of the mixed paint shall be as follows:

<b>High Solids Epoxy System G Intermediate Coating</b>	
<b>Item</b>	<b>Requirement</b>
Viscosity, Krebs-Stormer, 77 F KU	80-130
VOC Content, max., lb/gal	3.50
Fineness of Grind, Hegeman Gage, min.	4
Sag Resistance, Leneta Anti-Sag Meter, mils wet, min.	8
Dry to Touch, hours, max.	3
Dry to Handle, hours, max.	6

**1045.4.3 Packaging and Labeling.** Packaging and labeling shall be in accordance with [Sec 1045.2.3](#).

**1045.4.4 Manufacturer and Brand Name Approval.** Prior to approval and use of the specified coating system, the manufacturer shall submit to Construction and Materials a one-gallon unit of each coat of the coating system proposed. The manufacturer shall also submit a certified test report from an approved independent testing laboratory showing specific test results obtained on the specified coating system for Relative Humidity Resistance ASTM D 1735 or D 2247, 3000 hours, Salt Fog Resistance ASTM B 117, 3000 hours and Accelerated Weathering ASTM G 153 Cycle 1 (Carbon Arc), 4000 hours. ASTM G 155, Cycle 2, Xenon Arc or G 154, Cycle 2 QUV (Fluorescent UV-Condensation Type using Type A lamps) may be used as an alternate to Carbon Arc.

**1045.4.4.1** All coats of the system to be tested shall be applied to steel test panels that have been prepared according to AASHTO M 300. Each coat of the system shall be from the same manufacturer. Test panels for salt fog exposure shall be scribed as specified in ASTM D 1654 and, when rated according to ASTM D 1654, each panel shall receive a rating of 7 or greater.

Test panels shall not exhibit more than slight rusting, undercutting, discoloration, fading, blistering, chalking, loss of gloss or change in color. Accelerated weathering resistance testing shall be performed on test panels that have received finish coats in the specified colors for which approval is being requested. After 4,000 hours of testing for accelerated weathering resistance, each color of the finish coat shall show a difference in color of no greater than 3 ΔE, when compared to the control panel. Color change measurements shall be made in accordance with Section 6.2 CIE 1976 L\*a\*b\* of ASTM D 2244. All resistance testing shall be performed on duplicate sets of test panels, and upon completion of the prescribed exposure testing, the manufacturer shall submit one set of the exposed panels to Construction and Materials.

**1045.4.4.2** The manufacturer shall provide documentation that the specified coating system has performed satisfactorily for three years. The document shall include the name, address and telephone number of the proprietary agency and location of the structures. Upon approval of the coating by the engineer, further submittals for preliminary approval will not be required of that manufacturer for that brand name of coating, except as hereinafter noted. A new sample, new testing data and new test panels shall be submitted any time the manufacturing process or the batching proportions are changed. The engineer may withdraw manufacturer and brand name approval when sampling and testing of material offered for use indicates nonconformance to any of the requirements herein specified. All data submitted for preliminary approval will be considered confidential to MoDOT.

**1045.4.5 Alternate Approval.** If approved by Construction and Materials, compliance with all specified requirements for the system under NTPEP or NEPCOAT, in addition to the physical property requirements of this specification, may be substituted for the manufacturer and brand name approval requirements of [Sec 1045.4.4](#). If approval is requested under NTPEP or NEPCOAT, the accelerated weathering requirements stated in [Sec 1045.4.4](#) will apply. The manufacturer shall provide documentation identifying specific products evaluated, along with the manufacturer’s code numbers and/or report code numbers.

**1045.5 Polyurethane System G Finish Coating.**

**1045.5.1 Description.** The coating shall be a multiple-component, aliphatic acrylic polyurethane suitable for use over High Solids Epoxy Intermediate Coating. The coating shall cure to a semi-gloss to high gloss, abrasion resistant surface and shall provide an easily cleanable finish.

**1045.5.2 Mixed Coating.** The mixed coating properties shall be as follows:

Polyurethane System G Finish Coating		
Physical Property	Requirement	
Color, Federal Standard 595b	Gray 26373	Brown 30045
Viscosity, Krebs-Stormer, 77 F, KU	65-96	
VOC Content, lb/gal, max.	3.50	
Fineness of Grind, Hegeman Gage, min.	6	
Sag Resistance, Leneta Anti-Sag Meter, mils wet, min.	8	
Dry to Touch, hours, max.	4	
Dry to Handle, hours, max.	8	

**1045.5.3 Packaging and Labeling.** Packaging and labeling shall be in accordance with [Sec 1045.2.3](#).

**1045.5.4 Manufacturer and Brand Name Approval.** Manufacturer and brand name approval shall be in accordance with [Sec 1045.4.4](#) or [Sec 1045.4.5](#). If approval is requested

under [Sec 1045.4.5](#), the accelerated weathering requirements stated in [Sec 1045.4.4](#) will apply. The manufacturer shall provide documentation identifying specific products evaluated, along with the manufacturer's code numbers and/or report code numbers.

**1045.6 Waterborne Acrylic System H Intermediate and Finish Coating.**

**1045.6.1 Description.** The intermediate coating shall be a single component waterborne acrylic compatible as a coating over high solids inorganic zinc primers. The finish coating shall be a single component waterborne acrylic suitable for use over a waterborne acrylic intermediate coating. The finish coating shall cure to a tough, abrasion resistant surface that performs well in weathering exposures. The gray finish coat shall cure to a semi-gloss finish and the brown finish coat shall cure to a low-gloss finish.

**1045.6.2 Mixed Coating.** The color of the intermediate coat shall be gray (Federal Standard 595b No. 26373) or brown (Federal Standard 595b No. 30045) unless otherwise specified. The color of the intermediate coat will normally be required to match the color of the finish coat. The mixed coating properties shall be as follows:

<b>Waterborne Acrylic System H Intermediate and Finish Coating</b>		
<b>Physical Property</b>	<b>Requirement</b>	
Color, Finish Coat, Federal Standard 595b	Gray 26373	Brown 30045
Viscosity, Krebs-Stormer, 77 F, KU	80-100	
VOC Content, lb/gal, max.	3.50	
Fineness of Grind, Hegeman Gage, min.	7	
Sag Resistance, Leneta Anti-Sag Meter, mils wet, min.	8	
Dry to Handle, hours, max.	2	

**1045.6.3 Packaging and Labeling.** Packaging and labeling shall be in accordance with [Sec 1045.2.3](#).

**1045.6.4 Manufacturer and Brand Name Approval.** Prior to approval and use of waterborne acrylic intermediate and finish coats, the manufacturer shall obtain manufacturer and brand name approval in accordance with [Sec 1045.4.4](#) or [Sec 1045.4.5](#), except that, after the 4000 hour testing for accelerated weathering resistance, the Federal Standard 595b 30045 (brown) color of the finish coat shall show a difference in color of no greater than 4 ΔE when compared to the control panel. If approval is requested under [Sec 1045.4.5](#), the accelerated weathering requirements stated in [Sec 1045.4.4](#) will apply. The manufacturer shall provide documentation identifying specific products evaluated, along with the manufacturer's code numbers and/or report code numbers.

**1045.7 Polysiloxane System I Finish Coating.**

**1045.7.1 Description.** The coating shall be a multiple-component, Polysiloxane suitable for use over High Solids Inorganic Zinc, or High Solids Epoxy Intermediate Coating. The coating shall cure to a semi-gloss to high gloss, abrasion resistant surface and shall provide an easily cleanable finish.

**1045.7.2 Mixed Coating.** The mixed coating properties shall be as follows:

<b>Polysiloxane System I Finish Coating</b>	
<b>Physical Property</b>	<b>Requirement</b>
Color, Federal Standard 595b	Gray 26373   Brown 30045
Viscosity, Krebs-Stormer, 77 F, KU	Within Manufactures submitted range
VOC Content, lb/gal, max	2.0
Fineness of Grind, Hegeman Gage, min.	6
Sag Resistance, Leneta Anti-Sag Meter, mils wet, min.	8+
Dry to Touch, hours, max.	3
Dry to Handle, hours, max.	8

**1045.7.3 Packaging and Labeling.** Packaging and labeling shall be in accordance with section 1045.2.3.

**1045.7.4 Manufacturer and Brand Name Approval.** Manufacturer and brand name approval shall be in accordance with Sec 1045.4.4 or Sec 1045.4.5. If approval is requested under Sec 1045.4.5, the accelerated weathering requirements stated in Sec 1045.4.4 will apply. The manufacturer shall provide documentation identifying specific products evaluated, along with the manufacturer's code number and/or report code numbers.

**1045.8 Aluminum Epoxy-Mastic Primer.**

**1045.8.1 Description.** The coating shall be a one-coat system aluminum epoxy-mastic primer designed for adhesion to rusty steel, aged galvanized steel and other uses. Aluminum epoxy-mastic primer will not be permitted for use on any surface that is to be in contact with fresh concrete. The epoxy-mastic shall be a two-component, modified epoxy-primer containing metallic-aluminum flake.

**1045.8.2 Pigment.** The primary pigment shall be metallic-aluminum.

**1045.8.3 Vehicle.** The vehicle shall be an epoxy-type. The curing agent shall have suitable insensitivity to moisture to allow trouble-free application.

**1045.8.4 Mixed Coating.**

**1045.8.4.1** The coating shall be well-ground, not caked, skinned or badly settled in the container. The mixed coating, when applied in one coat, shall be capable of achieving 5 mils dry film thickness without runs or sags.

**1045.8.4.2** The mixed coating properties shall be as follows:

<b>Aluminum Epoxy-Mastic Primer</b>	
<b>Physical Property</b>	<b>Requirement</b>
Dry to touch, hours, max.	24
Dry hard, days, max.	5 <sup>a</sup>
VOC Content, lb/gal, max.	3.50

<sup>a</sup>When air-cured at a temperature of 75 F or above to a hard, tough film by evaporation of solvent and chemical reaction.

**1045.8.5 Resistance Tests.** Test panels of steel in accordance with ASTM D 609, and having dimensions of 2 x 5 x 1/8 inch shall be prepared by sandblasting all surfaces to a white metal condition in accordance with *Structural Steel Painting Council* SP5 (SSPC-SP5-82). The cleaned panels shall then be exposed to outdoor weather for 30 days or until uniform rusting occurs. The panel shall then be hand cleaned with a wire brush in accordance with SSPC-SP2-82. A 6-mil dry coating of the epoxy-mastic shall then be applied in one coat in accordance with the manufacturer's current recommendations. The coating shall be cured as recommended by the manufacturer. Fresh Water, Salt Water, and Weathering and Salt Fog resistance tests, as detailed herein, shall be performed on one or more test panels. The material will not be approved if any individual test panel fails any of the resistance tests specified herein.

**1045.8.5.1 Fresh Water Resistance.** Panels shall be scribed down to base metal with an "X" of at least 2-inch legs, and shall be immersed in fresh tap water at  $75 \pm 5$  F. The panels shall show no rusting, blistering or softening beyond 1/16 inch from the scribe mark, when examined after 30 days. Discoloration of the coating will be permitted.

**1045.8.5.2 Salt Water Resistance.** Panels shall be scribed down to base metal with an "X" of at least 2-inch legs and immersed in five percent sodium chloride at  $75 \pm 5$  F. The panels shall show no rusting, blistering or softening beyond 1/16 inch from the scribe mark upon examination after 7, 14 and 30 days. Discoloration of the coating will be permitted. The sodium chloride solution shall be replaced with fresh solution after each examination.

**1045.8.5.3 Weathering and Salt Fog Resistance.** Panels shall be tested in the weatherometer in accordance with ASTM G 154 QUV (Fluorescent UV-Condensation Tape using Type A Lamps) for 300 hours using a test cycle consisting of four hours light followed by four hours condensation. After this period, the panels shall be removed and scribed with an "X" of at least 2-inch legs down to base metal. The test panels shall then be tested in accordance with ASTM B 117. After 1,000 hours of continuous exposure, the coating shall show no loss of bond, nor shall the coating show rusting or blistering beyond 1/16 inch from the center of the scribe mark.

**1045.8.6 Packaging and Labeling.** Packaging and labeling shall be labeled in accordance with [Sec 1045.2.3](#).

**1045.8.7 Approval and Prequalification.**

**1045.8.7.1 Manufacturer and Brand Name Approval.** Prior to approval and use of the epoxy-mastic primer, the manufacturer shall submit to Construction and Materials a one-gallon sample of the coating and a certified test report from an approved independent testing laboratory showing specific test results conforming to all quantitative and resistance test requirements of these specifications. The certified test report shall contain the exact ratio, by weight, of the pigment component to the vehicle component of the epoxy-mastic used for the tests, the lot tested, the manufacturer's name, brand name of the epoxy-mastic, and date of manufacture. In addition, the manufacturer shall submit a complete set of tested panels that have undergone each required resistance test. The set of panels submitted shall include one untested control panel that has been prepared in accordance with [Sec 1045.8.5](#). Upon approval by Construction and Materials of this certified test report, further resistance tests will not be required of that manufacturer for that brand name of epoxy-mastic primer, except as noted. New certified test results shall be submitted any time the manufacturing process or the epoxy-mastic formulation is changed, and may be required by the engineer when sampling and testing of material offered for use indicates nonconformance to any of the requirements specified herein.

**1045.8.7.2 Final Acceptance.** Final acceptance of the epoxy-mastic primer will be based on a manufacturer's certification submitted by the contractor to the engineer and on results of tests conducted on samples of the material. Each lot of each component will be sampled and tested prior to approval or use of the material.

**1045.9 Gray Epoxy-Mastic Primer.**

**1045.9.1 Description.** This specification covers a one-coat gray epoxy-mastic primer system designed for adhesion to rusty steel, aged galvanized steel and other uses, including uses in contact with freshly poured Portland cement concrete. The epoxy-mastic shall be a multiple-component modified epoxy containing gray pigmentation, and shall be in accordance with the requirements specified herein.

**1045.9.2 Pigment.** The pigmentation shall be any pigment or combination of pigments formulated to offer the intended protective properties to the cured coating, and shall be totally non-reactive to the constituents contained in both cured and uncured Portland cement concrete.

**1045.9.3 Vehicle.** The vehicle shall be an epoxy type. The curing agent shall have suitable insensitivity to moisture to allow trouble-free application.

**1045.9.4 Mixed Coating.**

**1045.9.4.1** The provisions of [Sec 1045.8.4.1](#) will apply.

**1045.9.4.2** The mixed coating properties shall be as follows:

<b>Gray Epoxy-Mastic Primer</b>	
<b>Physical Property</b>	<b>Requirement</b>
Color, Federal Standard 595b	Gray 26373
Viscosity, (Krebs-Stormer, 25 C) KU	90 - 120
Volatile Organic Content, lb/gal, max.	3.50
Dry to touch, hours, max.	24
Dry hard, days, max.	7 <sup>a</sup>

<sup>a</sup>When air-cured at a temperature of 75 F or above to a hard, tough film by evaporation of solvent and chemical reaction.

**1045.9.5 Resistance Tests.** Test requirements and approval criteria shall be in accordance with [Sec 1045.8.5](#).

**1045.9.6 Packaging and Labeling.** Packaging and labeling shall be in accordance with [Sec 1045.2.3](#).

**1045.9.7 Approval and Prequalification.**

**1045.9.7.1 Manufacturer and Brand Name Approval.** Manufacturer and brand name approval shall be in accordance with [Sec 1045.8.7.1](#).

**1045.9.7.2 Final Acceptance.** Final acceptance will be in accordance with [Sec 1045.8.7.2](#).

**1045.10 Calcium Sulfonate System.**

**1045.10.1 Description.** This specification covers calcium sulfonate sealer, calcium sulfonate primer and various colors of calcium sulfonate topcoat paints for steel. The color of topcoat

will be specified in the contract and shall be in accordance with all requirements specified herein.

**1045.10.1.1** The primary resin used to manufacture each coat of the calcium sulfonate system shall be a modified overbased crystalline calcium sulfonate that creates a highly polar complex capable of protecting the underlying steel from corrosion. In addition to the calcium sulfonate complex, the paint shall contain film forming oleoresinous compounds that act to reduce tack in the dry film.

**1045.10.1.2** The coating material shall be uniform, stable in storage, and free from grit and coarse particles.

**1045.10.2 Calcium Sulfonate Rust Penetrating Sealer.**

**1045.10.2.1 General.** The sealer, after allowing a minimum drying time, may be recoated with an approved primer or topcoat. The sealer will be suitable for any steel structure that has developed pack rusting in overlapping steel plates, joints or at bolted areas. This coating shall be used on in-place structures as part of a long-term maintenance program, and as such shall be applied in accordance with SSPC-PA1, *Shop, Field and Maintenance Painting*.

**1045.10.2.2 Properties.** The mixed coating properties shall be as follows:

<b>Calcium Sulfonate Rust Penetrating Sealer</b>	
<b>Physical Property</b>	<b>Requirement</b>
<b>Color</b>	<b>Red iron oxide</b>
Modified Crystalline Overbased Calcium Sulfonate, percent by weight, min.	15
Coarse Particles and Skins as retained on No. 325 (45µm) mesh sieve, percent, max.	1.0
Viscosity, #4 Ford Cup, Seconds	50 - 70
VOC Content, lbs/gal., max.	3.5
Drying Time, hours to recoat	2 - 6
Flash Point, F, max	104
Salt Fog Resistance, 500 hours (Coating applied at 1-2 mils dry film over SSPC-SP5 cold rolled steel)	No more than 1% rust undercutting, blistering or peeling.

**1045.10.3 Calcium Sulfonate/Alkyd Primer.**

**1045.10.3.1 General.** This primer shall be used in non-abrasion exposures to provide a firm, corrosion resistant, highly adherent film. This primer may be used for in-place structures but shall not be used as a shop-applied primer.

**1045.10.3.2 Properties.** The mixed coating properties shall be as follows:

<b>Calcium Sulfonate/Alkyd Primer</b>	
<b>Physical Property</b>	<b>Requirement</b>
<b>Color</b>	<b>Red iron oxide</b>
Modified Crystalline Overbased Calcium Sulfonate, percent by weight, min.	15
Coarse Particles and Skins as retained on No. 325 mesh sieve, percent, max.	1.0
Viscosity, 77 F, KU	90 – 120
VOC Content, lbs/gal, max.	3.50

Fineness of Grind, Hegman Units, min.	5
Drying Time, Hours (3 to 4 Mil Dry Film):	
Dust Dry	1 – 4
Tack Free	5 – 12
Dry Firm	24 – 48
Sag Resistance, Mils	12+
Salt Spray Resistance, 1500 hours (4 mil dry film over SSP-SP-5 blasted cold rolled steel – 1 to 2 mil profile)	No more than 1 % under-cutting, blistering or peeling.

**1045.10.4 Calcium Sulfonate/Alkyd Topcoat.**

**1045.10.4.1 General.** Calcium sulfonate/alkyd topcoat shall be a medium to light gray, brown, green or tan low-gloss coating as specified in the contract for use over calcium sulfonate/alkyd penetrating sealer or calcium sulfonate/alkyd primer. This paint shall be used as a topcoat for a calcium sulfonate/alkyd corrosion inhibitive primer, and shall be applied in accordance with SSPC-PA 1, *Shop, Field, and Maintenance Painting*. The topcoat may be used for in-place structures and shall not be used as a shop-applied finish.

**1045.10.4.2 Properties.** The mixed coating properties shall be as follows:

Calcium Sulfonate/Alkyd Topcoat				
Physical Property	Requirement			
	Brown	Gray	Tan	Green
Color, Federal Standard 595b	30045	26373	23522	24260
Modified Crystalline Overbased Calcium Sulfonate, per cent by weight, min.	15			
Coarse Particles and Skins as retained on No. 325 mesh sieve, percent, max.	1.0			
Viscosity, 77 F, KU	90-130			
Fineness of Grind, Hegman Units, min.	5			
Drying Time, 2-3 mils , hours				
Dust Dry	1 - 4			
Tack Free	5 - 12			
Dry Firm	24 – 48			
VOC Content, lbs/gal, max.	3.5			
Sag Resistance, Mils	12+			
QUV Weathering Resistance, 1000 hrs. (4 mil dry film over SSP-SP-5 blasted cold rolled steel - 1-2 mil profile)	No excessive chalking, blistering, or change in color.			

Salt Spray Resistance, 1000 hrs (4 mil dry film over SSP- SP-5 blasted cold rolled steel – 1-2 mil profile)	No more than 1 % rust under-cutting, blistering or peeling.
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**1045.10.5 Test Methods.** The test methods used to verify compliance with the properties specified in [Secs 1045.10.2](#), [1045.10.3](#) and [1045.10.4](#) shall be as follows:

<b>American Standards for Testing and Materials (ASTM)</b>	
G154	Practice for Operating Light- and Water-Exposure Apparatus
B117	Salt Spray (Fog) Testing
D562	Consistency of Paints Using the Stormer Viscometer
D1200	Viscosity of Paints, Varnishes and Lacquers by Ford Viscosity Cup
D1210	Fineness of Dispersion of Pigment-Vehicle Systems
D1475	Density of Paint, Varnish, Lacquer and Related Products
D3278	Flash Point of Liquids by Seta Flash Closed Tester
D3960	VOC Content of Paints
Federal Test Method Standard No. 141	
Method 4061	Drying Time
Method 4494	Sag Test (multi-notch blade)

**1045.10.6 Pigment Settlement.** The paint shall have perfect suspension (10 rating) when tested as specified in ASTM D 869, when stored for six months.

**1045.10.7 Working Properties.** The paint shall be uniform and easily spray-applied when tested in accordance with Federal Standard No.141, Method 4331. The primer and topcoat shall show no streaking, running or sagging after drying.

**1045.10.8 Storage.** The paint shall show no thickening, curdling, gelling or hard caking when tested as specified in Federal Standard No.141, Method 3011 after storage for six months from date of delivery in tightly covered containers at a temperature of at least 50 F and no more than 110 F.

**1045.10.9 Packaging and Labeling.** Packaging and labeling shall be in accordance with [Sec 1045.2.3](#).

**1045.10.10 Approval and Prequalification.**

**1045.10.10.1 Manufacturer and Brand Name Approval.** Prior to approval and use of the calcium sulfonate coating system, the manufacturer shall submit to Construction and Materials a one-gallon sample of each coat of the proposed coating system. The manufacturer shall also submit a certified test report from an approved independent laboratory showing specific test results as follows:

(a) Calcium Sulfonate Penetrating Sealer. Salt spray resistance of steel panels prepared and tested in accordance with [Sec 1045.10.2.2](#).

(b) Calcium Sulfonate Primer. Salt spray resistance of steel panels prepared and tested in accordance with [Sec 1045.10.3.2](#).

(c) Calcium Sulfonate Topcoat. Salt spray resistance and QUV weathering resistance in accordance with [Sec 1045.10.4.2](#).

**1045.10.10.2 Final Acceptance.** Final acceptance of calcium sulfonate penetrating sealer, calcium sulfonate primer and calcium sulfonate topcoat will be based on the manufacturer's certification submitted by the contractor to the engineer, and on results of tests conducted on samples of the material. Each lot will be sampled and tested prior to approval and use.