BRIDGE PAINTS MGS-92-08G

1.0 SCOPE. This specification covers paint and primers for use in painting bridges by the Maintenance Division.

1.1 Unless otherwise stated, specification section references are from the version, in effect at the time of this bid request, of the Missouri Standard Specifications for Highway Construction and its supplements.

2.0 MATERIALS.

2.1 ALUMINUM EPOXY-MASTIC PRIMER. Aluminum vinyl epoxy-mastic primer shall be a one-coat system designed for adhesion to rusty steel, aged galvanized steel, and other uses.

2.1.1 Material. The epoxy-mastic shall be a two component modified epoxy containing metallic aluminum flake and shall comply with the requirements specified herein.

2.1.2 Pigment. The primary pigment shall be metallic aluminum.

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

2.1.4 Mixed Coating.

2.1.4.1 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.

2.1.4.3 The shelf life of the epoxy-mastic shall be a minimum of 12 months.

2.1.4.4 The epoxy-mastic shall air cure at temperatures of 75 F or above to hard, tough film within 5 days by evaporation of solvent and chemical reaction. It shall be dry to the touch in 24 hours at 75 F. It shall have a maximum VOC content of 3.50 lbs/gal.

2.1.4.7 Resistance Tests. Test panels of steel meeting the requirements of ASTM D 609 having dimensions of 2 x 5 inches 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. They 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.

2.1.4.7.1 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 ± 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 allowed.

2.1.4.7.2 Salt Water Resistance. Panels shall be scribed down to base metal with an X of at least 2-inch legs and immersed in 5 percent sodium chloride at 75 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 allowed. The sodium chloride solution shall be replaced with fresh solution after each examination.

2.1.4.7.3 Weathering and Salt Fog Resistance. Panels shall be tested in the weatherometer in accordance with ASTM G 154 QUV(Fluorescent UV-Condensation Type 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 1000 hours of continuous exposure, the coating shall show no loss of bond, nor shall it show rusting of blistering beyond 1/16 inch from the center of the scribe mark.

2.1.5 Packaging and Labeling.

2.1.5.1 The epoxy-mastic coating shall be packaged in two containers. The components shall be prepackaged such that mixing of a 1:1 ratio, by volume, utilizes a complete container of each component. Each container shall bear a label on which shall be clearly shown the manufacturer, brand name of paint, lot number, date of manufacture, and shelf life. The label on the vehicle container shall also include complete instructions for the use of this paint. The container shall be coated, if necessary, to prevent attack by the paint components.

2.1.6 Manufacturer and Brand Name Approval. Prior to approval and use of aluminum epoxy-mastic primer, the manufacturer shall submit to the State Construction and Materials Engineer, 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 also 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. Upon approval by 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 epoxy-mastic primer. 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 herein specified.

2.2 HIGH SOLIDS INORGANIC ZINC SILICATE PAINT. High solids inorganic zinc paint shall comply with the requirements of Sec 1045.1 and 1045.3.

2.3 WATERBORNE ACRYLIC TOPCOAT. The coating shall be a single component waterborne acrylic suitable for use over Section 2.5 High Solids Inorganic Zinc Silicate Paint of this specification and over weathered existing structural steel coatings. The coating shall comply with the requirements of Section 1045.1 and Section 1045.6.

2.4 GRAY EPOXY-MASTIC PRIMER

2.4.1 MATERIAL. The epoxy-mastic shall be a two component modified epoxy containing gray pigmentation and shall comply with the requirements specified herein.

2.4.2 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.

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

2.5 Mixed Coating.

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

2.5.2 Pigment.

2.5.3 Mixed Coating Properties.

Color, Federal Standard 595b	Gray 26373
Viscosity, (Krebs-Stormer, 77 F) KU	90 - 120
Volatile Organic Content, lb/gal., max.	3.50
Dry to touch, hours, max.	24
Dry hard, days, max.	7

2.5.4 Shelf Life. The shelf life of the epoxy-mastic shall be a minimum of 12 months.

2.5.5 Resistance Tests. Test panels of steel meeting the requirements of ASTM D 609 having dimensions of 2 x 5 inches 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 panels 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 printed instructions. 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.

2.5.5.1 Fresh Water Resistance. Panels shall be scribed down to base metal with an "X" of at least 2 inch (50 mm) legs and shall be immersed in fresh tap water at 75 $\pm$ 5 F (24 $\pm$ 2 C). The panels shall show no rusting, blistering, or softening beyond 1/16 inch (2 mm) from the scribe mark, when examined after thirty days. Discoloration of the coating will be allowed.

2.5.5.2 Salt Water Resistance. Panels shall be scribed down to base metal with an "X" of at least 2 inch (50 mm) legs and immersed in 5 percent sodium chloride at 75 $\pm$ 5 F (24 $\pm$ 2 C). The panels shall show no rusting, blistering, or softening beyond 1/16 inch (2 mm) from the scribe mark upon examination after seven, fourteen, and thirty days. Discoloration of the coating will be allowed. The sodium chloride solution shall be replaced with fresh solution after each examination.

2.5.5.3 Weathering and Salt Fog Resistance. Panels shall be tested in the weatherometer in accordance with ASTM G 154 QUV(Fluorescent UV-Condensation Type 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", with at least 2 inch legs, down to base metal. The test panels shall then be tested in accordance with ASTM B 117. After 1000 hours of continuous exposure, the coating shall show no loss of bond, nor shall it show rusting of blistering beyond 1/16 inch from the center of the scribe mark.

2.5.6 Packaging and Labeling.

2.5.6.1 The epoxy-mastic coating shall be packaged in two containers. The components shall be prepackaged such that mixing of a 1:1 ratio, by volume, utilizes a complete container of each component. Each container shall bear a label on which shall be clearly shown the manufacturer, brand name of paint, lot number, date of manufacture and shelf life. The label on the vehicle container shall also include complete instructions for the use of this paint. The container shall be coated, if necessary, to prevent attack by the paint components.

2.6 Application.

2.6.1 The epoxy-mastic shall be applied over a SSPC-SP2, SSPC-SP3 or SSPC-SP6 surface preparation, including removal of all rust scale, loose rust, loose mill scale, and loose or non-adherent paint. Oil and grease shall be removed in accordance with SSPC-SP1 Solvent Cleaning.

2.6.2 The epoxy-mastic shall be applied by spray, brush or roller in accordance with the manufacturer's printed instructions except as herein modified. The contractor shall furnish the engineer a complete set of the manufacturer's printed instructions at least 2 weeks prior to beginning surface preparation.

2.6.3 The epoxy-mastic shall not be applied when either the temperature of the metal or the air is below 50 F and shall not be applied when the temperature is expected to drop to 40 F or below before the coating has cured or when the steel surface temperature is at or below 5 F above the dew point as determined in accordance with MoDOT Test Method T 38.

2.6.4 The epoxy-mastic shall be applied in one coat to a 5 mil dry film thickness.

2.6.5 Manufacturer and Brand Name Approval. Prior to approval and use of gray epoxy-mastic primer, the manufacturer shall submit to the State Construction and Materials Engineer, 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 also 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. Upon approval by 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 epoxy-mastic primer. 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 herein specified.

2.6.5.1 Final acceptance of the gray epoxy-mastic primer will be based on a manufacturer's certification submitted by the contractor to the engineer and upon results of tests made on samples of the material. The engineer will sample and test each lot of each component prior to approval or use of the material.