

SECTION 1092—EPOXY PROTECTION FOR STRUCTURAL STEEL

1092.1 DESCRIPTION—This work is the coating of surfaces of structural steel with an electrostatically applied, fusion-bonded epoxy.

1092.2 MATERIAL—

(a) Coating System. Use powdered epoxy coating material from a manufacturer listed in [Bulletin 15](#). Certify as specified in [Section 106.03\(b\)3](#).

Provide fusion-bonded epoxy coating that is a one-part, heat-curable, thermosetting, powdered coating conforming to AASHTO M 284/M 284M, modified as follows:

- Wherever the terms “deformed steel reinforcing bar(s),” “plain steel reinforcing bar(s),” “reinforcing steel,” “bar(s),” or “reinforcing bar(s)” appear, substitute the terms “structural steel member(s),” “structural steel,” or “member(s)” as applicable.
- Unless otherwise indicated, coating color to match Federal Standard No. 595, Color No. 14223 (Foliage green).
- Section 4—Reinforcing Steel. Revise the title of the section and the section to read:

4. Structural Steel.

4.1 Furnish structural steel to be coated conforming to the requirements of applicable AASHTO standard specifications, as indicated or specified, and free of contaminants such as oil, grease, paint, and silvers. Structural steel exhibiting any silver-like defects after the heating and coating process will be rejected unless satisfactorily repaired. A single recorded coated steel member thickness measurement is defined as the average of three individual readings obtained from three immediately adjacent areas on the body of the member. Obtain a minimum of five recorded measurements approximately evenly spaced along each side of the test specimen (i.e., a minimum of ten recorded measurements per specimen). The film thickness limits do not apply to patched areas.

- Section 7.3—Adhesion. Delete this section.
- Section 8—Test Methods. Revise this section as follows:

Revise the first sentence in Subsection 8.1 to read:

Measure the thickness of the coating on the body of the member as specified in Section 4.1.

Subsection 8.3—Adhesion of Coating. Delete this section.

- Section 12—Repairs Due to Handling. Revise Subsection 12.2 to read:

Satisfactorily repair damage to the epoxy coating that occurs during fabrication, shipping, or installation either according to Section 11.1 or by mechanical wire brush cleaning and painting with an approved epoxy paint using the paint manufacturer's approved procedure. Repair any member with visible signs of rust according to Section 11.1. Do not cover more than 5% of the total surface area with patching material.

- Section 15—Fabrication of Steel Reinforcing Bars After Coating. Delete this section.
- Section A1.3—Specimens for Test. Revise this section as follows:

Revise Subsection A1.3.1 to read:

Submit the following type and number of test specimens for test:

(1) Two steel plates 100 mm x 100 mm x 12 mm (4 inches by 4 inches by 1/2 inch), cleaned, and uncoated.

(2) Four steel plates 100 mm x 100 mm x 12 mm (4 inches by 4 inches by 1/2 inch), and coated with a film thickness of 250 μm (10 mils).

(3) Three films of epoxy (of the minimum thickness proposed for use during production coating of structural steel) for the chloride permeability test.

Revise the last sentence in the first paragraph in Subsection A1.3.3 to read:

Measure the thickness of the film on the body of the member.

- Section A1.4.4—Flexibility of Coating. Delete this section.
- Section A1.4.5—Bond Strength to Concrete. Delete this section.
- Section A1.4.7—Impact Test. Revise the third sentence to read:

Have impact occur on those areas that will be subject to impact when member is used for its intended purpose, if this can be determined. Otherwise, have impact occur on any areas.

- Section A1.4.8—Hardness Test. Revise the last sentence to read:

Meet or exceed a Knoop Hardness Number of 16 when averaging four individual hardness measurements made on at least two specimens.

1092.3 CONSTRUCTION—

(a) General. Apply coating in an environmentally controlled plant that is fully enclosed. Provide a fully automatic coating system with the capability of preheating and post-baking. Use a fully automatic grit-blast cleaning machine, enclosed in an environmentally controlled plant.

(b) Surface Preparation. Free all surfaces of oil or any mill coating.

Gritblast the steel to white metal, as defined in SSPC-SP5, using a mixture of steel shot and grit. Protect clean surfaces from conditions of high humidity, rainfall, or surface moisture. Do not allow the steel to flash rust before coating. Provide a uniform, angular anchor blast profile from 50 μm to 125 μm (2 mils to 5 mils) deep. Determine anchor pattern depth by the Keane-Tator Surface Profile Comparator or Testex Replica Tape.

(c) Application of Coating. Apply the coating material according to the manufacturer's recommendation as to application procedure and curing schedule. In no case allow the over temperature, or temperature of the steel during any part of the curing process, to exceed 260 °C (500F).

Provide a cured coating of uniform color, gloss, and thickness, and free of blisters, pinholes, fish eyes, sags, runs, and other irregularities.

Provide a finished coating thickness of 250 $\mu\text{m} \pm 50 \mu\text{m}$ (10 mils ± 2 mils) tested according to ASTM G 12.

(d) Inspection. The coater is responsible for all QC checks including visual inspection, thickness measurements, and holiday testing, and for keeping records on the results of all such inspections in an approved form.

Provide access to each part of the process to the Inspector. Allow the Inspector to witness any QC tests, and perform such tests himself or herself on a random sampling basis, if requested by the Inspector.

After cure, check the coating for continuity using a 67.5 V wet sponge detector to check for holidays, pinholes, and voids. Allow no more than an average of 6 holidays per meter. Satisfactorily repair all defects.

(e) Touch-Up System. Provide a compatible two-part epoxy touch-up system designed and color-matched for patching the epoxy coating used on the structural steel. Satisfactorily patch all defects in the epoxy coating, areas damaged during erection, and all visible uncoated areas. Do not cover more than 5% of the total surface area with patching material.

1. Surface Preparation. Apply coating directly to the metal for maximum performance. Ensure that metal is clean, dry, and free of rust and scale. Blast clean to NACE near white where possible. Remove grease, oil, and other substances with suitable solvents. Coat cleaned surface before oxidation occurs.

2. Mixing. Mix Part A and Part B of the two-part system in the proportions recommended by the manufacturer. Mix the two parts thoroughly until a uniform color is obtained. If required, thin each part separately, with thinner recommended by the system manufacturer, to minimize loss of pot life. Furnish material having a pot life of at least 8 hours. Discard material that is not used within the pot life specified by the manufacturer.

3. Application. Apply material with ordinary brush or roller, according to the manufacturer's instructions, and as directed. Achieve a track free surface in 2 hours to 3 hours at 22 °C (72F). Achieve full cure in 3 days to 5 days at 22 °C (72F). Exercise care in handling pieces before they are fully cured.

1092.4 MEASUREMENT AND PAYMENT—Epoxy protection for structural steel is incidental to the items of work protected.