Designation: A950/A950M – 99 (Reapproved 2007)

Standard Specification for Fusion-Bonded Epoxy-Coated Structural Steel H-Piles and Sheet Piling[1]

This standard is issued under the fixed designation A950/A950M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers structural steel H-piles and sheet piling with protective fusion-bonded epoxy coating applied by the electrostatic spray, flocking, or fluidized bed process.

NOTE 1—The coating applicator is identified throughout this specification as the manufacturer.

1.2 Requirements for coatings are contained in Annex A1.

1.3 This specification is applicable for orders in either inch-pound units (as Specification A950) or SI units (as Specification A950M). The values stated in either inch-pound or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets.

1.4 *This standard does not purport to address any of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

A6/A6M Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling

A36/A36M Specification for Carbon Structural Steel

A328/A328M Specification for Steel Sheet Piling

A572/A572M Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel

A588/A588M Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance

A690/A690M Specification for High-Strength Low-Alloy Nickel, Copper, Phosphorus Steel H-Piles and Sheet Piling with Atmospheric Corrosion Resistance for Use in Marine Environments

A857/A857M Specification for Steel Sheet Piling, Cold Formed, Light Gage

B117 Practice for Operating Salt Spray (Fog) Apparatus

D2200 Practice for Use of Pictorial Surface Preparation Standards and Guides for Painting Steel Surfaces

D3451 Guide for Testing Coating Powders and Powder Coatings

G8 Test Methods for Cathodic Disbonding of Pipeline Coatings

G12 Test Method for Nondestructive Measurement of Film Thickness of Pipeline Coatings on Steel

G14 Test Method for Impact Resistance of Pipeline Coatings (Falling Weight Test)

G20 Test Method for Chemical Resistance of Pipeline Coatings

2.2 *American Petroleum Institute Specification:*[3]

API RP 5L7 Recommended Practice for Internal Fusion Bonded Epoxy Coating of Line Pipe

2.3 *National Association of Corrosion Engineers Standard:*[4]

TM0175 Visual Standard for Surfaces of New Steel Centrifugally Blast Cleaned with Steel Shot or Steel Grit (Nace No. 2)

2.4 *Steel Structures Painting Council Standards:*[5]

SSPC-SP 1 Surface Preparation Specification No. 1: Solvent Cleaning

SSPC-SP 10 Near-White Blast Cleaning

SSPC-VIS 1 Visual Standards

3. Ordering Information

3.1 Information items to be considered, if appropriate, for inclusion in purchase orders are as follows:

3.1.1 Specification designation and year of issue for H-pile or sheet piling,

3.1.2 Section,

[1] This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is under the direct responsibility of Subcommittee A01.02 on Structural Steel for Bridges, Buildings, Rolling Stock and Ships.

Current edition approved Sept. 1, 2007. Published September 2007. Originally approved in 1995. Last previous edition approved in 2003 as A950/A950M – 99 (2003). DOI: 10.1520/A0950_A0950M-99R07.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from the American Petroleum Institute, 1220 L St., Washington, DC 20005.

[4] Available from the National Institute of Corrosion Engineers, 1440 South Creek, Houston, TX 77084.

[5] Available from the Steel Structures Painting Council, 40 24th St., Pittsburgh, PA 15213.

3.1.3 Quantity,

3.1.4 Length,

3.1.5 Portions to be coated (full length or distance from end to remain bare),

3.1.6 Requirements for certifications (see 13.1),

3.1.7 Requirements for material samples (see 4.3),

3.1.8 Requirements for patching material sample (see 4.5),

3.1.9 Requirements for visual standard of comparison for surface cleaning (see 5.1),

3.1.10 Requirements for number and frequency of tests (see 8.1), and

3.1.11 Requirements for inspection at the manufacturing plant (see 11.1).

NOTE 2—An example of an ordering description is as follows: Structural steel sheet piling, Grade 60, Type 1, to ASTM 572 – ; section PZ35, 20 000 ft, 40 ft, 0 in. long in secured lifts, epoxy-coated to ASTM A950– , including certification for coated sheet piling, sample of coating material, 2 gal of patching material, and surface cleaning comparison with SSPC-VIS 1.

[Structural steel sheet piling, Grade 400, Type 1, to ASTM 572M – ; section PZ35, 6000 m, 12 m long in secured lifts, epoxy-coated to ASTM A 950M– , including certification for coated sheet piling, sample of coating material, 8 L of patching material, and surface cleaning comparison with SSPC-VIS 1].

4. Materials

4.1 Steel H-piles to be coated shall meet the requirements of Specifications A36/A36M, A572/A572M, A588/A588M, or A690/A690M, whichever is specified in the order. Steel sheet piling to be coated shall meet the requirements of Specifications A328/A328M, A572/A572M, A690/A690M, or A857/A857M, whichever is specified in the order.

NOTE 3—Surface conditions such as slivers, gouges, laminations, pits, and sharp edges can cause coating application difficulties and effort should be made to hold these conditions to a minimum.

4.2 The coating material shall meet the requirements listed in Annex A1 and shall be approved by the purchaser.

4.2.1 A written certification shall be furnished to the purchaser that properly identifies the batch designation of the powder coating used in the order, material, quantity represented, date of manufacture, name and address of manufacturer, and a statement that the supplied powder coating is the same composition as that prequalifed to Annex A1 of this specification. The powder coating shall be used within the manufacturer's written recommended shelf life.

4.3 If specified in the order, a representative 8-oz. [0.2-kg] sample from each batch of the powder coating shall be supplied to the purchaser. The sample shall be packaged in an airtight container and identified by the batch designation.

4.4 The powder coating shall be maintained in a temperature-controlled environment following the written recommendations of the powder coating manufacturer until ready for use, at which point the powder coating will be given sufficient time to reach approximate plant ambient temperature.

4.5 The patching material shall be as recommended by the powder coating manufacturer and shall be compatible with the coating. If specified in the order, a sample of the patching material shall be supplied to the purchaser.

5. Surface Preparation

5.1 Prior to blast cleaning, the surfaces of steel H-piles and sheet piling to be coated shall be precleaned, as required, in accordance with SSPC-SP 1. Steel surfaces shall be cleaned by abrasive blast cleaning to near-white metal in accordance with SSPC-SP 10. The cleaning media used shall produce an anchor pattern profile of 1.5 mils to 4.0 mils [40 to 100 µm]. The visual standard of comparison used to define the final surface condition shall be SSPC-VIS 1 or TM0175. Expended blasting media debris and dust shall be removed from blasted surfaces prior to applying coating.

5.2 Prior to application of the fusion-bonded epoxy coating, raised slivers, scabs, laps, sharp edges, or seams shall be removed using abrasive grinders. No individual area of grinding shall exceed 36 in.^{2}[230 cm^2]. Total area of grinding shall not exceed 1 % of total surface area.

5.3 Slivers raised during the cleaning or coating application process shall be treated as permissible coating damage and repaired per Section 10.

5.4 It shall be permissible for a chemical wash and/or conversion of the steel H-piles or sheet piling surface to be used. This pretreatment shall be applied after abrasive blast cleaning and before coating, in accordance with the written application instructions specified by the pretreatment manufacturer.

6. Application of Coating

6.1 The powder coating shall be applied to the cleaned and pretreated (if applicable) surface as soon as possible and before visible oxidation of the surface occurs, as discernible to a person with normal or corrected vision. In no case shall application of the coating be delayed more than 3 h after cleaning.

6.2 To achieve the required coating thickness (see 7.1), the steel shall be preheated prior to applying the powder coating in accordance with the manufacturer's written recommendations. The heat source shall not leave a residue or contaminant on the steel surfaces. If oxidation occurs, the steel shall be cooled to ambient temperature and recleaned before applying the powder coating.

6.3 The powder coating shall be applied and cured in accordance with the powder coating manufacturer's written recommendations.

6.4 Areas of steel sections not requiring coating to allow welding or for other purposes shall be specified by the purchaser and shall be blocked-out during the coating application.

7. Requirements for Coated H-Piles and Sheet Piling

7.1 *Thickness of Coating*:

7.1.1 The minimum thickness of coating after curing on flat surfaces of H-piles and sheet piling shall be 12 mils [300 µm]. The minimum thickness of coating after curing on edges and corners of sections, as measured on flat surfaces ½ in. [13 mm] from these edges and corners of sections, shall be a minimum of 7 mils [175 µm]. It shall be permissible for the coating thickness to be reduced on the ball and socket of sheet piling.

7.1.2 Measurements shall be made in accordance with Test Method G12 following the instructions for calibration and use