

## MEASUREMENT AND ACCEPTANCE OF FILM THICKNESS OF STRUCTURAL STEEL COATINGS

### 1. SCOPE:

- 1.1. This method covers the requirements for obtaining film thickness measurements of structural steel coatings. It is intended to provide standards for field determinations of wet film thickness (WFT) of coatings using a notch gage and of dry film thickness (DFT) of coatings by means of destructive testing using a Tooke gage and non-destructive means using a type II magnetic gage.

### 2. REFERENCES:

- 2.1. ASTM D4414 Standard Practice for Measurement of Wet Film Thickness by Notch Gages.
- 2.2. ASTM D-4136 Standard Test Methods for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive Means (Test Method A).
- 2.3. ASTM D-1186 Standard Test Methods for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base (Test Method B).
- 2.4. SSPC PA-2 Measurement of Dry Coatings Thickness with Magnetic Gages.

### 3. DEFINITIONS:

- 3.1. WFT – Wet film thickness
- 3.2. DFT – Dry film thickness
- 3.3. Notch gage – Rigid metal gage with notched sides used to measure WFT of applied coatings.
- 3.4. Tooke gage – Instrument used to measure DFT by observation of angular cuts in the coatings through a microscope having a built-in illuminated reticle with a scale.
- 3.5. Overcoating project – Coatings projects requirement new coatings to be applied over properly prepared surfaces containing intact existing coatings.
- 3.6. Type II gage – Electronically operated instrument used to measure DFT utilizing a probe that houses a permanent magnet or coil energized by alternating current that is placed directly on the surface.
- 3.7. Control area – Sequentially identified areas of a structure enclosed with proper containment

used to separate phases of work.

4. **PROCEDURE A – MEASUREMENT OF WET FILM THICKNESS OF STRUCTURAL STEEL COATINGS:**
  - 4.1. Wet film thickness (WFT) measurements shall be obtained for structural steel coatings with elongated curing schedules.
  - 4.2. Notch gages shall be used as described in ASTM D4414 to obtain WFT measurements
  - 4.3. Frequency and acceptance of WFT measurements shall be determined in accordance with Section 7.
5. **PROCEDURE B – MEASUREMENT OF DRY FILM THICKNESS OF STRUCTURAL STEEL COATINGS BY DESTRUCTIVE MEANS:**
  - 5.1. Dry film thickness (DFT) measurements for structural steel coatings applied on overcoating projects shall be obtained using destructive DFT testing.
  - 5.2. Tooke gages shall be used as described in ASTM D4136 (Method A) to obtain DFT measurements.
  - 5.3. Frequency and acceptance of destructive DFT measurements shall be determined in accordance with Section 7.
  - 5.4. Repair each measurement site by feathering the edges of each Tooke cut and reapplying each coating with respect to the manufactures stated recoat window.
6. **PROCEDURE C – MEASUREMENT OF DRY FILM THICKNESS OF STRUCTURAL STEEL COATINGS BY NON-DESTRUCTIVE MEANS.**
  - 6.1. Dry film thickness (DFT) measurements for structural steel coatings applied on projects requiring complete removal and replacement of existing coatings shall be obtained using non-destructive DFT testing.
  - 6.2. Type II magnetic gages shall be used as described in ASTM D1186 (Method B) to obtain DFT measurements.
  - 6.3. Frequency and acceptance for non-destructive DFT measurements shall be in accordance with SSPC PA-2 applied to each control area.
7. **FREQUENCY AND ACCEPTANCE OF MEASUREMENTS:**
  - 7.1. Obtain a minimum of five (5) arbitrarily selected measurements for each control area containing up to 5000 square feet of surface area..
  - 7.2. Obtain a minimum of one (1) arbitrarily selected measurement for each 1000 square feet or portion thereof for each control area containing greater than 5000 square feet of surface area.

- 7.3 Each measurement obtained shall be with  $\pm 25\%$  of the specified coatings application range.
- 7.4 The average of all measurements taken within a control area shall be within the specified coatings application range.

8. CORRECTIVE ACTIONS:

- 8.1. In any area where unacceptable film thickness measurements are obtained either above or below the stated application range in accordance with 4.3, 5.3 or 6.3, obtain additional measurements to identify the extent of the unacceptable area.
- 8.2. With respect to 4.3 and 5.3, isolate areas of unacceptable film thickness by obtaining a minimum of an additional five (5) arbitrarily selected measurements, by the specified method, for each 1000 square feet of surface area or portion thereof within each affected control area.
- 8.3. Acceptance of film thickness measurements for each 1000 square feet of surface area or portion thereof of each affected control area shall be in accordance with Section 7.
- 8.4. With respect to 6.3, isolate areas of unacceptable film thickness in accordance to 4.1.4 of SSPC PA-2 applied to each control area.
- 8.5. Repair areas found to be below the acceptable stated application range by applying additional coating, with respect to manufacturers stated recoat window and surface preparation requirements.
- 8.6. Repair areas found to be above the acceptable stated application range by removing and replacing the unacceptable coating.
- 8.7. Verify the film thickness of each applied coating in any area requiring repair using the specified method of measurement.

9. REPORT:

- 9.1. Report the following for each coating application for each control area.
- 9.2. Square feet of surface area.
- 9.3. Manufactures recommended application range.
- 9.4. Each measurement obtained.
- 9.5. Average of all measurements obtained.

9.6. Location of any areas requiring corrective action and description of corrective actions employed.

APPROVED

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DIRECTOR  
DIVISION OF MATERIALS

DATE

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