

SECTION 05 05 13
SHOP-APPLIED COATINGS FOR METAL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Work includes labor, materials, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing operations in connection with furnishing, delivery and installation of the work of this Section, meeting current building codes and manufacturer's latest printed instructions, complete as shown on the drawings and/or specified herein.

1.2 REFERENCE STANDARDS

- A. American Architectural Manufacturers Association (AAMA) (www.aamanet.org):
1. AAMA 620 – Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Aluminum Substrates.
 2. AAMA 621 – Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates.
 3. AAMA 2603 – Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 4. AAMA 2604 – Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 5. AAMA 2605 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. ASTM International (ASTM) (www.astm.org):
1. ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.
 2. ASTM C 207 – Standard Specification for Hydrated Lime for Masonry Purposes.
 3. ASTM D 523 – Standard Test Method for Specular Gloss.
 4. ASTM D 714 – Standard Test Method for Evaluating Degree of Blistering of Paints.
 5. ASTM D 870 – Standard Practice for Testing Water Resistance of Coatings Using Water Immersion.
 6. ASTM D 968 – Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
 7. ASTM D 1654 – Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
 8. ASTM D 2244 – Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
 9. ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
 10. ASTM D 2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
 11. ASTM D 3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
 12. ASTM D 3363 – Standard Test Method for Film Hardness by Pencil Test.
 13. ASTM D 4145 – Standard Test Method for Coating Flexibility of Prepainted Sheet.
 14. ASTM D 4214 – Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
 15. ASTM D 4585 / D 4585M – Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation.
 16. ASTM D 5402 – Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs.
 17. ASTM D 6578 / D 6578M – Standard Practice for Determination of Graffiti Resistance.
 18. ASTM D 7091 – Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals.
 19. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

20. ASTM E 1980 – Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.
21. ASTM G 85 – Standard Practice for Modified Salt Spray (Fog) Testing.

C. US Green Building Council (USGBC) (www.usgbc.org):

1. LEED Green Building Rating System, NC (New Construction), Version 2009 and v4.

1.3 COORDINATION

A. Coordination of Shop-Applied Coating Systems:

1. Coordinate submittal and selection procedures for metal products to receive shop-applied coating systems.
2. Where products are indicated to match coatings selected for other products, adjust formulations as required to achieve match.
3. Submit samples for verification, indicating compliance with matching requirements.

1.4 SUBMITTALS

A. Comply with Section 01 33 00 – Submittal Procedures.

B. Product Data: Submit manufacturer's product data for each coating system specified, including:

1. Type of coating system.
2. Type of substrates.
3. AAMA compliance.
4. DFT of each coat.
5. Total DFT.
6. Physical properties.
7. Application characteristics.
8. Accelerated test data.
9. Field performance.

C. Samples: Submit manufacturer's samples of each color and gloss specified for each coating system specified for:

1. Selection.
2. Verification on each specified metal substrate.

D. Manufacturer's Certification: Submit manufacturer's certification that coating systems comply with specified requirements and are suitable for intended application.

E. LEED Submittals:

1. Product Test Reports for Credit SS 7.2: For metal roof panel coatings to document compliance with solar reflectance index requirement.

F. Manufacturer's Project References: Submit manufacturer's list of recently completed shop-applied coating system projects, including project name and location, name of architect, type of metal products receiving shop-applied coating systems, and type and quantity of shop-applied coating systems furnished.

G. Applicator's Project References: Submit applicator's list of recently completed shop-applied coating system projects, including project name and location, name of architect, type of metal products receiving shop-applied coating systems, and type and quantity of shop-applied coating systems applied.

H. Cleaning and Maintenance Instructions: Submit manufacturer's cleaning and maintenance instructions for shop-applied coating systems, including:

1. Graffiti removal instructions.

I. Warranty Documentation: Submit manufacturer's standard warranty.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged, for minimum of 10 years, in the manufacturing of shop-applied coating systems of similar type to that specified.
- B. Applicator's Qualifications:
 - 1. Applicator regularly engaged in application of shop-applied coating systems of similar type to that specified.
 - 2. Employ persons trained for application of shop-applied coating systems.
 - 3. Approved by manufacturer.
 - 4. Equipped, trained, and approved for application of shop-applied coating systems required for this Project.
 - 5. Approved to provide warranty specified in this section.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Shop-Applied Coating Systems:
 - 1. Delivery Requirements: Deliver coating systems to applicator in manufacturer's original, unopened containers and packaging, with labels clearly identifying:
 - a. Coating system name.
 - b. Manufacturer.
 - c. Color.
 - d. Weight.
 - e. Gallons.
 - f. Batch number.
 - 2. Storage and Handling Requirements:
 - a. Store and handle coating systems in accordance with manufacturer's instructions.
 - b. Keep coating systems in manufacturer's original, unopened containers and packaging until shop application.
 - c. Protect coating systems during storage, handling, and shop application to prevent contamination or damage.
- B. Metal Products to Receive Shop-Applied Coating Systems:
 - 1. Delivery Requirements: Refer to sections specifying metal products to receive shop-applied coating systems.
 - 2. Storage and Handling Requirements:
 - a. Refer to sections specifying metal products to receive shop-applied coating systems.
 - b. Package and protect metal product finish during storage, handling, and installation.
 - c. Protect metal product finish from damage from standing water.
 - d. Protect metal product finish from contact with materials that could damage or adversely affect shop-applied coating systems.
 - e. Protect metal product finish with temporary protective coverings until after installation.

1.7 WARRANTY

- A. Applicator's Warranty:
 - 1. Applicator agrees to repair finish or replace coated metal products that demonstrate deterioration of shop-applied coating systems within warranty period.
 - 2. Exposed Coating Systems: Deterioration includes, but is not limited to:
 - a. Solid Colors: Color fading in excess of 5 delta E Hunter color units in accordance with ASTM D 2244, Appendix XI.1.
 - b. Peeling, checking, or cracking of coating adhesion to metal.
 - c. Chalking in excess of a No. 8 in accordance with ASTM D 4214, Method A.
- B. Warranty Period: 10 20 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: The Valspar Corporation, Valspar Coil and Extrusion, PO Box 1461, Minneapolis, Minnesota 55440. Toll Free 888-306-2645. Website www.valsparinspireme.com. Email inquiries@valsparinspireme.com
- B. Substitutions: In accordance with Division 1.

2.2 APPLICATORS

- A. Approved Applicators: Shop-applied coating systems by applicators qualified as specified in the Quality Assurance article of this section.

2.3 PERFORMANCE REQUIREMENTS

- A. LEED:2009 - Solar Reflective Index (SRI): Provide metal roof panel coatings with SRI of not less than 78 for slopes of 2:12 (low slope) or less than 29 for slopes greater than 2:12 (steep slope) in accordance with ASTM E 1980.
 - 1. LEED v4: 82 initial SRI and 64 aged SRI for slopes 2:12 or less (low slope) and 39 initial SRI and 32 aged SRI for slopes greater than 2:12 (steep slope).
- B. Energy Star Compliance: Provide metal roof panel coatings identical to those listed on US Department of Energy's ENERGY STAR Roof Products Qualified Product List.
- C. CEC-Title 24 Compliance for Low-Slope: Provide metal roof panel coatings with aged SRI not less than 0.55 and emissivity not less than 0.75 with a SRI of 64.

2.4 SHOP-APPLIED COIL COATING SYSTEMS FOR ALUMINUM SHEET

- A. Shop-Applied, Fluoropolymer Coil Coating System for Aluminum Sheet: Valspar "Fluoropon" coil coating system.
 - 1. Coating Type: 70 percent polyvinylidene fluoride (PVDF) fluoropolymer resin.
 - 2. Compliance: AAMA 620.
 - 3. Application Method: Shop-applied, reverse roll coat.
 - 4. Substrate: Pretreated aluminum.
 - 5. Specular Gloss, ASTM D 523:
 - a. Standard Gloss: 20 to 35 units on a 60-degree meter.
 - b. Low Gloss: 8 to 15 units on a 60-degree meter.
 - c. Low Sheen: 10 units maximum on both a 60-degree meter and an 85-degree meter.
 - 6. Pencil Hardness, ASTM D 3363: HB to 2H.
 - 7. T-Bend, ASTM D 4145: 1T to 3T, no loss of adhesion.
 - 8. Cross Hatch Adhesion, ASTM D 3359: No loss of adhesion.
 - 9. Reverse Impact, ASTM D 2794: 1.5x metal thickness, no loss of adhesion.
 - 10. Humidity Resistance, ASTM D 2247, 100 percent relative humidity, 3,000 hours: No field blisters.
 - 11. Salt Spray Resistance, ASTM B 117, 3,000 hours: Creep from scribe less than or equal to 1/16 inch (2 mm), no field blisters.
 - 12. South Florida Exposure, ASTM D 2244 and D 4214, Method A:
 - a. Color: No more than 5 delta E Hunter color units at 20 years.
 - b. Chalk: Rating no less than 8 at 20 years.
 - c. Film Integrity: 20 years.
 - 13. Flame Test, ASTM E 84: Class A coating.
 - 14. Water Immersion, ASTM D 870, 500 hours, 100 degrees F: No loss of adhesion.
 - 15. Abrasion Resistance, ASTM D 968, Method A: 65, plus or minus 10 liters.
 - 16. Graffiti Resistance, ASTM D 6578 / D 6578M: Pass.

2.5 COATING SCHEDULE – SHOP-APPLIED COIL COATING SYSTEMS FOR ALUMINUM SHEET

- A. Shop-Applied, Fluoropolymer Coil Coating System for Aluminum Sheet: Valspar “Fluropon” coil coating system.
 - 1. Dry Film Thickness (DFT), ASTM D 7091: 3-coat system.
 - a. Primer: 0.20 to 0.50 mils.
 - b. Color Coat: 1.00 to 1.50 mils.
 - c. Clear Topcoat: 0.80 to 1.30 mils.
 - d. Total, Minimum: 2.00 to 3.00 mils.
 - 2. Color: As scheduled .
 - 3. Gloss: Select from manufacturer’s full range .
- B. Pretreatment: Mechanically clean and chemically pretreat metal products in accordance with:
 - 1. Coating manufacturer’s instructions.
 - 2. AAMA 620.
- C. Coating System Application: Apply coating system in accordance with:
 - 1. Coating manufacturer’s instructions.
 - 2. AAMA 620.

PART 3 EXECUTION

(Not Used)

END OF SECTION