

SECTION 05 0513

SHOP-APPLIED METAL FINISHES

This section includes editing notes to assist the user in editing the section to suit project requirements. These notes are included as hidden text, and can be revealed or hidden by one of the following methods:

Microsoft Word 2007: Click the OFFICE button, select WORD OPTIONS, select DISPLAY, then select or deselect the HIDDEN TEXT option.

Microsoft Word (earlier versions): From the pull-down menus select TOOLS, then OPTIONS. Under the tab labeled VIEW, select or deselect the HIDDEN TEXT option.

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GENERAL

1.1 SUMMARY

A. Section Includes:

1. Shop-applied [PVDF] [anodize] finishes for aluminum [railings] [architectural metalwork] [roof panels] [wall panels] [doors] [frames] [entrances] [storefronts] [windows] [curtain walls] [translucent panel systems] [louvers] [skylights] [sun screens] [and] [_____].

B. Related Sections:

1. Division 01: Administrative, procedural, and temporary work requirements.
2. Section [05 5000- Metal Fabrications] [05 7000 - Decorative Metals] [05 5800 - Formed Metal Fabrications] [____ - _____]: Architectural metalwork to receive shop-applied finishes.
3. Section [05 5000 - Metal Stairs] [05 5200 - Metal Railings] [____ - _____]: Metal railings to receive shop-applied finishes.
4. Section [07 4113 - Metal Roof Panels] [07 4213 - Metal Wall Panels] [____ - _____]: Metal [roof] [wall] panels to receive shop-applied finishes.
5. Section [07 6100 - Sheet Metal Roofing] [____ - _____]: Metal roofing to receive shop-applied finishes.
6. Section [07 6200 - Sheet Metal Flashing and Trim] [____ - _____]: Metal flashings and trim to receive shop-applied finishes.
7. Section [07 6300 - Sheet Metal Roofing Specialties] [____ - _____]: Metal roof specialties to receive shop-applied finishes.
8. Section [07 6400 - Sheet Metal Wall Cladding] [____ - _____]: Metal wall cladding to receive shop-applied finishes.
9. Section [08 1113 - Hollow Metal Doors and Frames] [____ - _____]: Steel doors and frames to receive shop-applied finishes.
10. Section [08 1116 - Aluminum Doors and Frames] [____ - _____]: Aluminum doors and frames to receive shop-applied finishes.
11. Section [08 3213 - Sliding Aluminum-Framed Glass Doors] [____ - _____]: Aluminum sliding doors to receive shop-applied finishes.
12. Section [08 4113 - Aluminum Entrances and Storefronts] [____ - _____]: Aluminum entrances and storefronts to receive shop-applied finishes.
13. Section [08 4200 - Entrances] [____ - _____]: Metal entrances to receive shop-applied finishes.
14. Section [08 4413 - Glazed Aluminum Curtain Walls] [____ - _____]: Aluminum curtain wall to receive shop-applied finishes.
15. Section [08 4433 - Sloped Glazing Assemblies] [____ - _____]: Metal sloped glazing assemblies to receive shop-applied finishes.
16. Section [08 4500 - Translucent Wall and Roof Assemblies] [____ - _____]: Metal wall and roof assemblies to receive shop-applied finishes.
17. Section [08 6200 - Unit Skylights] [08 6300 - Metal-Framed Skylights] [____ - _____]: Aluminum skylight assemblies to receive shop-applied finishes.

18. Section [08 5113 - Aluminum Windows and Glass Doors] [__ ____ - ____]: Aluminum windows and glass doors to receive shop-applied finishes.
19. Section [08 9100 - Louvers] [__ ____ - ____]: Aluminum louvers to receive shop-applied finishes.
20. Section [10 7113 - Fixed Sun Screens] [__ ____ - ____]: Aluminum sun screens to receive shop-applied finishes.

1.2 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
 1. 611 - Voluntary Specification for Anodized Architectural Aluminum.
 2. 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Architectural Extrusions and Panels.
 3. 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Architectural Extrusions and Panels.
- B. ASTM International (ASTM)www.astm.org:
 1. B449 - Standard Specification for Chromates on Aluminum.
 2. D1730 - Standard Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting.
 3. D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
 4. D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.

1.3 SUBMITTALS

- A. Submittals for Review:
 1. Product Data: Manufacturer's descriptive data and test results for specified finishes.
 2. Samples: [2 x 3-1/2] [__ x __] inch coating samples [showing available colors] [in specified color] on aluminum backing.
- B. Quality Control Submittals:
 1. Certificates of Compliance: Manufacturer's certification that finishes applied on Project components comply with referenced AAMA standards.
- C. Closeout Submittals:
 1. Maintenance Data: Provide information regarding touch-up, cleaning, and maintenance of finishes.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Certified by AAMA and listed on AAMA Verified Components List.
- B. Verify accuracy of components, quantities, and sizes prior to application of finishes.
- C. Applicator - PVDF-Based Finishes:
 1. Use regenerative thermal oxidizer to destroy VOC's.
 2. Utilize chrome-based five-stage pretreatment system applied in accordance with AAMA and ASTM standards.
 3. Possess in-house blending capabilities, allowing for only specific amount of paint needed for each project.
 4. Utilize automated rotary atomization spray bell application providing uniform coverage with manual spray reinforcement for coverage in areas unreachable by automation.
 5. Employ skilled professional field service division to repair warranty or application issues arising at Project site.
 6. Utilize documented quality control protocol in accordance with AAMA 2605 test procedures.
 - a. Color uniformity: 8.1.1.
 - b. Performance: 8.1.2.
 - c. Specular gloss: 8.2.

- d. Dry film hardness: 8.3.
- e. Dry adhesion: 8.4.1.1.
- f. Wet adhesion: 8.4.1.2.
- g. Boiling water adhesion: 8.4.1.3.
- h. Direct impact: 8.5.
- i. Abrasion resistance: 8.6.
- j. Muriatic acid resistance 8.7.1.
- k. Mortar resistance:8.7.2.
- l. Nitric acid resistance: 8.7.3.
- m. Detergent resistance: 8.7.4.
- n. 24-hour window cleaner resistance: 8.7.5.
- o. Online Quality Assurance Inspection:
 - 1) Proper paint coverage: 5.0.
 - 2) Visual/appearance: 5.2.
 - 3) Dry-film thickness: 5.3.
 - 4) Color 2ÅE per ASTM D2244, Section 3.
 - 5) Gloss: +/- 5 units of manufacturers specification.
- p. Apply AAMA 2605 compatible water-based air-dry system.

D. Applicator - Anodize Finishes:

- 1. Offer both caustic (traditional) and eco-friendly (acid) etching technologies.
- 2. Utilize fully automated, computer-controlled process lines for consistency throughout Project.
- 3. Utilize documented quality control protocol in accordance with AAMA 611 test procedures :
 - a. Color uniformity: 8.3.
 - b. Gloss uniformity: 8.4.
 - c. Oxide coating thickness: 9.1.
 - d. Oxide coating weight/density: 9.2.
 - e. Seal test: 9.8.
 - f. Online quality assurance inspection:
 - 1) Random sample check for color uniformity: Maximum difference of 5ÅE.
 - 2) Random coating thickness testing: Minimum oxide coating of 18 microns (0.7 mil) for Class I clear and color anodize coatings and 10 microns (0.4 mils) for Class II clear anodize.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Apply manufacturer's standard protective coverings to finished surfaces.
- B. Deliver, store, and handle finished components in manner to prevent damage to finishes.
- C. Furnish touch-up paint along with each material shipment.

1.6 WARRANTIES

- A. Furnish manufacturer's [10] [20] year warranty providing coverage that coatings:
 - 1. Will not chip, crack or peel (lose adhesion) but this does not include minute fracturing which may occur in proper fabrication of building parts.
 - 2. Will not chalk in excess of ASTM D4214 Number 8 rating, determined by procedure outlines in ASTM D4214.
 - 3. Will not change color more than five Delta-E Hunter units (square root of the sum of square Delta L, Delta a, and Delta b) as determined by ASTM D2244, Method 6.3. Fading or color changes may not be uniform if surfaces are not equally exposed to sun and elements. Mica and metallic coatings are exempt due to inability to accurately measure color; mica and metallic flakes reflect and scatter light in random patterns.
- B. Furnish applicator's 10 year warranty providing coverage against failure of PVDF-based coating over improper pretreatment where coating was not applied in accordance with ASTM D1730, Type B, Method 5 or ASTM B449, Section 5.

- C. Furnish manufacturer's 5 year warranty providing coverage that coatings:
 1. Will not chip, crack or peel (lose adhesion) but this does not include minute fracturing which may occur in proper fabrication of building parts.
 2. Will not chalk in excess of ASTM D4214 Number 8 rating, determined by procedure outlines in ASTM D4214.
 3. Will not change color more than five Delta-E Hunter units (square root of the sum of square Delta L, Delta a, and Delta b) as determined by ASTM D2244, Method 6.3. Fading or color changes may not be uniform if surfaces are not equally exposed to sun and elements. Mica and metallic coatings are exempt due to inability to accurately measure color; mica and metallic flakes reflect and scatter light in random patterns.
- D. Furnish applicator's 5 year warranty providing coverage against failure of PVDF-based coating over improper pretreatment where coating was not applied in accordance with ASTM D1730, Type B, Method 5 or ASTM B449, Section 5.
- E. Furnish applicator's [5] [10] year warranty providing coverage that coatings:
 1. Will resist cracking, crazing, flaking, and blistering if forming and welding are completed prior to finishing; post-forming or welding voids warranty.
 2. Will not chalk in excess of ASTM D4214 Number 8 rating, determined by procedure outlined in ASTM D-4214.
 3. Will not change color more than five Delta-E Hunter units (square root of the sum of square Delta L, Delta a, and Delta b) as determined by ASTM D2244, Method 6.3. Fading or color changes may not be uniform if surfaces are not equally exposed to sun and elements.

PART 2 PRODUCTS

2.1 APPLICATORS

- A. Acceptable Applicator: Linetec. (www.linetec.com)
- B. Substitutions: [Under provisions of Division 01.] [Not permitted.]

2.2 SHOP-APPLIED FINISHES

- A. PVDF-Based Coating: AAMA 2605, fluoropolymer finish containing minimum 70 percent PVDF resins, [two] [three] [four] coat system, [custom] [] color [to be selected from manufacturer's full color range].

**** OR ****

- B. PVDF-Based Coating: AAMA 2604, fluoropolymer finish containing minimum 50 percent PVDF resins, [two] [three] [four] coat system, [custom] [] color [to be selected from manufacturer's full color range].

**** OR ****

- C. Anodize Finish: AAMA 611, Architectural Class I anodized to 0.0007 inch minimum thickness, [clear.] [champagne] [light bronze] [medium bronze] [dark bronze] [extra dark bronze] [black] [copper] [] color.

**** OR ****

- D. Anodized Finish: AAMA 611, Architectural Class II anodized to 0.0004 inch minimum thickness, clear

**** OR ****

2.3 SHOP-APPLIED FINISHES WITH ANTIMICROBIAL PROTECTION

- A. PVDF-Based Coating: AAMA 2605, fluoropolymer finish containing minimum 70 percent PVDF resins, [three] coat system color [to be selected from manufacturer's full color range] with antimicrobial protection, paint code [_____].

PART 2 EXECUTION

2.1 ADJUSTING

- A. Touch up minor scratches and abrasions in finishes in accordance with finish manufacturer's instructions; replace components having damage that cannot be successfully touched up.

2.2 CLEANING

- A. Clean finished surfaces after installation in accordance with finish manufacturer's instructions.

2.3 SCHEDULE

| COMPONENT | FINISH TYPE | COLOR |
|----------------------|------------------|-----------------------------|
| Entrance Doors | 70 percent PVDF | Standard white |
| Curtain Wall | Class I anodized | Dark bronze |
| Interior Door Frames | Baked enamel | Custom color to be selected |

END OF SECTION