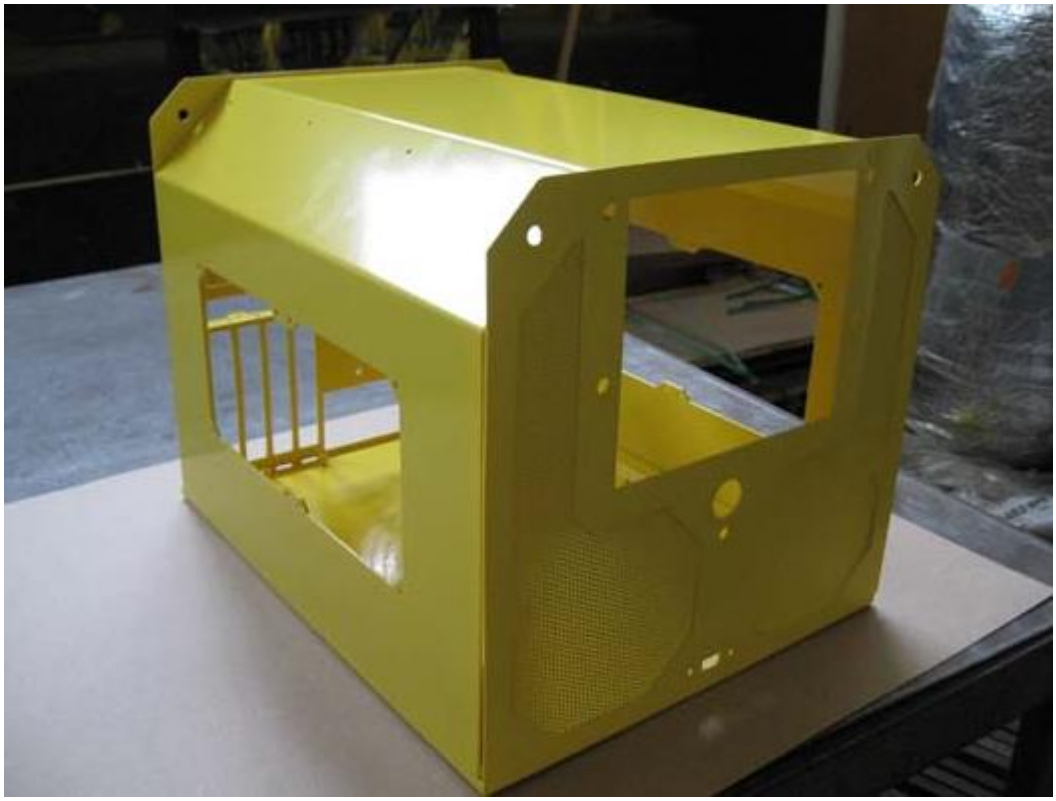
Technotes

Painting Aluminum



Painting Aluminum

All paint coating for aluminum, liquid or powder, are made of two principal ingredients: pigments for color and resin binders for gloss and hardness. Conventional liquid coatings pigments and binders amount to about 40% of solid compounds, with the balance of solvents being Volatile Organic Compounds or VOC's which dissipate during the thermal curing process. Powder coating uses no solvents and is applied in powder form without the side effect VOC's under environmental regulations. Fluoropolymer resins are fluorocarbon-based polymers (fluoropolymers) commonly referred to as "Kynar" coatings used in exterior architectural applications for color retention, Ultra-Violent resistance, and weatherability*.

Whether the coating is applied in liquid or powder form, and the resin/pigment chemistry are comparable, the finish will meet the same performance standards.

American Aluminum Manufactures Association (AAMA) Coating Standards for aluminum are organized in a sequence of basic, medium, and high performance standards:

AAMA 2603-15, Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels – good application for products without sustained exposure to UV or weathering.

AAMA 2604-13, Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels – better application where color fastness and weatherability over a 3-5 year period.

AAMA 2605-13, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels – best application for weathering, color retention, UV resistance over 10-20 year period.

* Weatherability testing is accomplished by one, five or 10 years of South Florida solar exposure with the test panel facing south to the sun at a 45-degree angle.

Painting aluminum is a two-step process, co-dependent for quality and performance.

Step one includes a pre-treat system to prepare the surface of the metal, typically a five stage process to clean, rinse, deoxidize, acid etch, and apply a conversion coating to ensure proper paint adhesion to the substrate. The conversion coating may be a non-hexavalent/trivalent chromium, iron-phosphate, or zirconium phosphate chemical.

Step two is direct application either manual or automated spray of primers and top coats. The line is electrostatically charged to draw the coating directly to the metal surface for maximum exposure. Liquid or powder coated parts then enter a thermal or infra-red curing oven to cure harden the paint to the substrate.

Conventional acrylic and high solids polyester liquid and polyester powder coatings meet AAMA 2603 standards.

Liquid siliconized-polyesters and 50% solids fluoropolymers, as well as super-durable polyester powder coatings, are used to qualify for AAMA 2604 requirements.

A 70% solids liquid or powder coatings are typically applied to meet AAMA 2605 standards.

Coatings on curtain wall systems, panels, coping, trim sections, and break metal components require maximum environmental protection with fluoropolymers. Interior metal components are usually specified with high solid polyesters or acrylics.

These standards provide for testing methodology for performance – impact resistance, adhesion, chemical resistance, mortar resistance, acid resistance and pencil hardness – and exposure to environmental factors, such as heat, humidity, ultraviolet rays and salt-spray.

For thickness, AAMA 2603 finish must be a minimum of 0.8 mil thickness, 2604 and 2605 require minimum of 1.2 mil thickness. Powder coating typically apply thicker by nature, approximately 0.4 to 0.7 mils more than liquids.

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By understanding state-of-the-art pretreatment methods as well as the standards governing architectural coatings, and by specifying the correct coating for each skyscraper's individual needs, the service life of the entire structure can be optimized.

Color selection is only limited by the imagination.

For more detailed information and best application advise, give us a call or email, we have a solution.

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