Powder Coatings for Architectural Applications: Powder Coatings for Design

Course number: IFS01

Provider Name: IFS Coatings
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Powder coatings – the basics
What is powder coating?

- Paint in a powder form
- Industrial manufactured
- Factory applied – metal substrates
- Sustainable alternative to liquid PVDF and anodized finishes
Applications for powder coating

- Architectural
- Automotive
- Appliance
- Furniture
- General Industrial
- Interiors
- Lighting
- Industrial landscaping

High performance architectural powders are different from other powder types.
How is powder made?

- Weigh out raw materials
  - pigment, hardner, resin
- Pre-mix
- Extruded
- Cooled
- Chipped
- Micronizer/Sieved
- Packed
Metal Pretreatment

- Powder – metal substrates
- Steel and aluminum
- Pre-treatment very important
- Aluminum
  - clean, pretreat, rinse, dry
  Chrome or non chrome - powder
  NO chrome primer required
Liquid PVDF paints MUST have chrome pretreatment and MUST have a chrome primer
How is powder applied

- In a spray booth
- Parts to be coated are hung on a conveyor belt and are grounded
- Powder in a hopper
- Pumped into a powder gun with electrodes at the end of it
- Gun fires, powder picks up the electrostatic charge
- Powder is attracted to the grounded parts
Powder Spray booth
Spraying powder
Curing powder coatings

Melt

Flow

Gel

Chemically React
Powder oven and finished goods line
Powder coatings for architecture
Architectural powder coating – what is it?

- High performance organic coating
- Applied to architectural aluminum and steel
- Single or double coat
- Exterior and interior grade
- Durable resin systems – just like Kynar
- Excellent warranties available
- Residential, commercial, monumental applications
Exterior applications

Residential
Commercial
Monumental

Windows
Doors
Skylights
Storefront
Curtain Wall
Mullions
Extrusions
Fencing
Hardware
Ceiling grids
Partitions

Housing
Skyscrapers
Hospitals
Stadiums
Government
111 57th, Manhattan, NYC
9th and Lenora, Seattle, WA
Las Vegas City Hall, NV
Cirque Condos, Dallas, TX
15 E 30th, NYC
Interior design applications

Residential
Commercial
Interior
Exterior

Furniture
Room trim
Accessories
Racking & Shelving
Windows
Doors
Skylights
Storefront
Fencing
Hardware
Lighting
Partitions
Architectural Applications
High performance architectural grade powders

Standard Polyester Powder
Interiors plus low value residential applications

Super Durable Polyester
Commercial windows, doors, storefront etc.

Fluoropolymer powder
Monumental, high value residential windows, doors, curtain wall etc.
Powder and AAMA
Powder and AAMA
American Architectural Manufacturers Association

Voluntary specification test procedures and performance requirements for pigmented organic coatings on aluminum extrusions and panels
AAMA Specifications

• **AAMA 2603**
  - Standard polyester powder

• **AAMA 2604**
  - High performance Super Durable powder

• **AAMA 2605**
  - High performance Fluoropolymer powder
AAMA tests

- Dry film hardness
- Adhesion
- Impact resistance
- Abrasion resistance
- Chemical resistance
- Corrosion resistance
- Weathering resistance
AAMA – Florida testing
AAMA 2603 – exterior exposure

- Panel tested for 1 year in Florida
- No checking, crazing or loss of adhesion after taping and only slight chalking and fading.
- 2603 applications tend to be windows, doors, fencing
AAMA 2604 – exterior exposure

- Panel tested for 5 years in Florida
- Maximum of 5 Delta E change in color, minimum 30% gloss retention
- 2604 applications include windows, doors, skylights, storefront, curtain walls
AAMA 2605 – exterior exposure

• Panel tested for 10 years in Florida

• Maximum of 5 Delta E change in color, minimum 50% gloss retention

• 2605 applications include windows, doors, storefront, curtain wall – monumental, skyscrapers, stadiums, hospitals, government buildings
Powder vs. liquid – color change

AAMA 2605 – 10 years Florida test

Bronze
Yellow
Grey

Liquid
Powder
Powder vs. liquid – gloss

AAMA 2605 – 10 years Florida test

Gloss

Years

Liquid

Powder

AAMA requirement
## AAMA tests - comparison

<table>
<thead>
<tr>
<th></th>
<th>AAMA 2603</th>
<th>AAMA 2604</th>
<th>AAMA 2605</th>
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</thead>
<tbody>
<tr>
<td><strong>Chemical resistance</strong></td>
<td></td>
<td>Same</td>
<td></td>
</tr>
<tr>
<td><strong>Humidity resistance</strong></td>
<td>1500 hours Few blisters</td>
<td>3000 hours Blisters size 8</td>
<td>4000 hours Blisters size 8</td>
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<tr>
<td><strong>Salt spray resistance</strong></td>
<td>1500 hours 1-2mm creepage Blisters size 8</td>
<td>3000 hours 1-2mm creepage Blisters size 8</td>
<td>4000 hours/2000hrs cyclical 1-2mm creepage Blisters size 8</td>
</tr>
<tr>
<td><strong>Florida exposure</strong></td>
<td>1 year</td>
<td>5 years</td>
<td>10 years</td>
</tr>
<tr>
<td><strong>Color retention</strong></td>
<td>Slight change</td>
<td>Delta E &lt;5</td>
<td>Delta E &lt;5</td>
</tr>
<tr>
<td><strong>Chalk resistance</strong></td>
<td>Slight change</td>
<td>No more than 8 rating</td>
<td>No more than 8 rating, 6 for whites</td>
</tr>
<tr>
<td><strong>Gloss retention</strong></td>
<td>Slight change</td>
<td>Minimum 30%</td>
<td>Minimum 50%</td>
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Choosing sustainable coatings that perform
The environmentally responsible choice

- No solvents or VOCs in high performance powder
- No toxic compounds in high performance powder
- Overspray can be reclaimed and recycled or reused
- No chrome
- No toxic sludge
- Single coat applications = less product & less energy
- Reduced fire and safety requirements
- EPA recognized
- Contributes to LEED
- LEED Environmental Product Declaration
The environmentally responsible choice

Overall LCA Results – Gate-to-Gate
Comparison of finishing techniques

![Normalized Environmental Impacts](image)

- Acidification Potential
- Eutrophication Potential
- Global Warming Potential
- Smog Potential
- Primary Energy Demand

- Powder Coating
- Anodizing
- Painting
Powder and design
Additional Functionality

The following can be added to powder coatings:

• Anti-microbial capability - interiors
• Anti-graffiti capability – interior and exteriors
• Clear coats
• Improved scratch and mar resistance
Architectural powder and design

- Vast array colors
- Low, mid, high gloss
- Metallics
- Translucents
- Textures
- Hammers/veins
- Patterns
Choosing powder – the practicalities
Choosing powder for architecture – the practicalities

- Registered applicators
- Touch up
- Care and maintenance
- Pricing
- Warranties
- Simple spec wording
- We can help
Questions?

This concludes The AIA and IDCEC Continuing Education Systems Course

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