



OVERCOATING AGED METAL PANELS

PROVIDING IMPROVED AESTHETICS WHILE
EXTENDING THE MAINTENANCE CYCLE



REGISTERED CONTINUING EDUCATION PROGRAM



COIL-COATED METAL PANELS— Roof and Wall Panels

Typical Applications

- Exterior applications to new construction or renovation
- Steel and aluminum, which include:
 - Metal curtain walls
 - Structural steel
 - Space frames
 - Metal canopies
 - Roofs
 - Decorative metal
 - Window and door frames



Traditional Coatings Used for Metal Panels

- OEM panels—original PVDF coil-coated finish
- Applied to exterior metal roof or wall panels
- These coatings have been popular since the 1960's and still are
- Offer very good long-term color/gloss retention and chemical resistance
- Typical life of these coatings: 20 to 30 years
- Difficult to overcoat

Why Overcoat?

- These coil coated panels are becoming aged and at the end of their aesthetic life
- Many of these existing panels are in need of new colors for company branding and image purposes



OVERCOATING AGED PANELS

What High-Performance Topcoats Can be Used?

Acrylics

- One component
- Easy application
- Provides basic UV protection
- Basic color and gloss retention
- Advanced technologies can provide dry-fall and hydrophobic characteristics.



Polyurethane/Polyurethane Hybrids

- Two-component, chemical cross-linking
- Superior color and gloss retention
- Topcoat over epoxies
- Resistance to abrasion
- Provides long-term protection from exterior weathering.

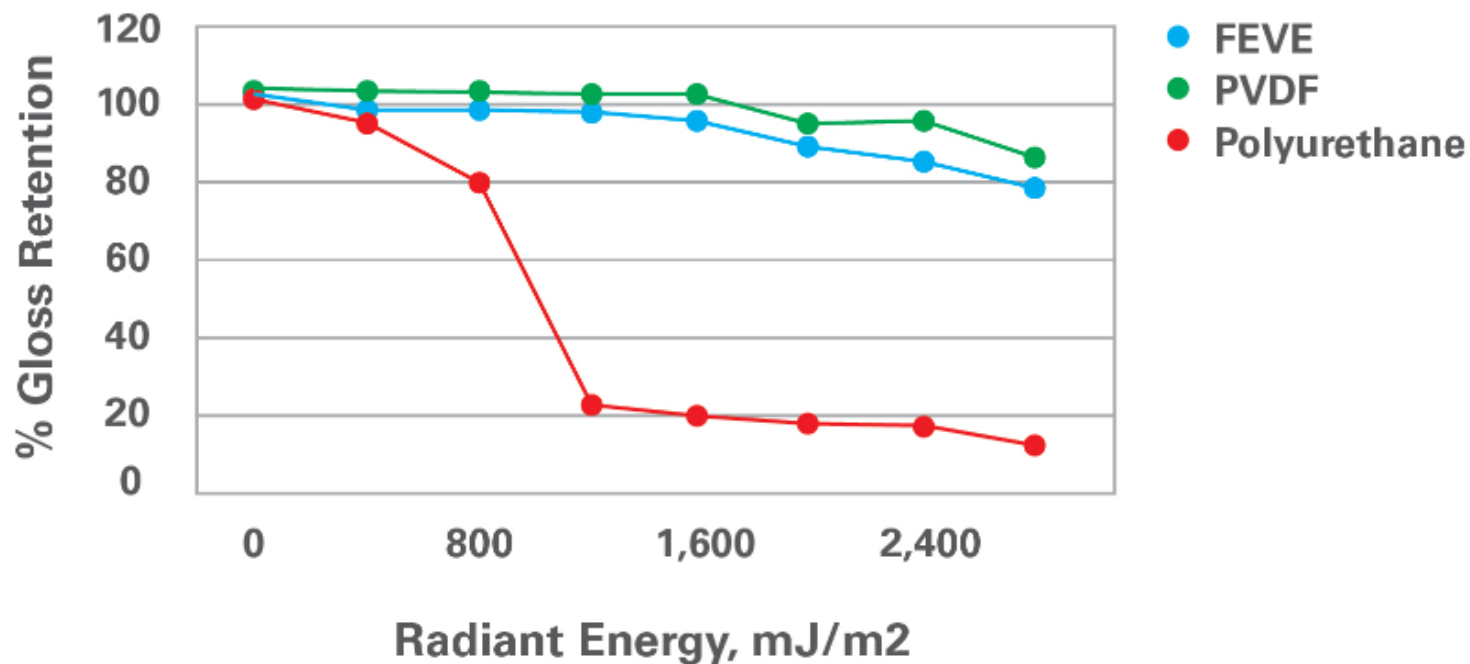
FEVE—Fluoropolymers

- Provide similar technology and performance to OEM finishes
- Excellent for overcoating existing factory applied PVDF coil-coatings
- Considered the “Gold” standard in protection against UV and weathering
- Provide exceptional color & gloss performance
- Air-dried version can be shop or field applied
- Improves aesthetics and helps in extending the maintenance cycle
- May contain Infrared Reflective Pigments



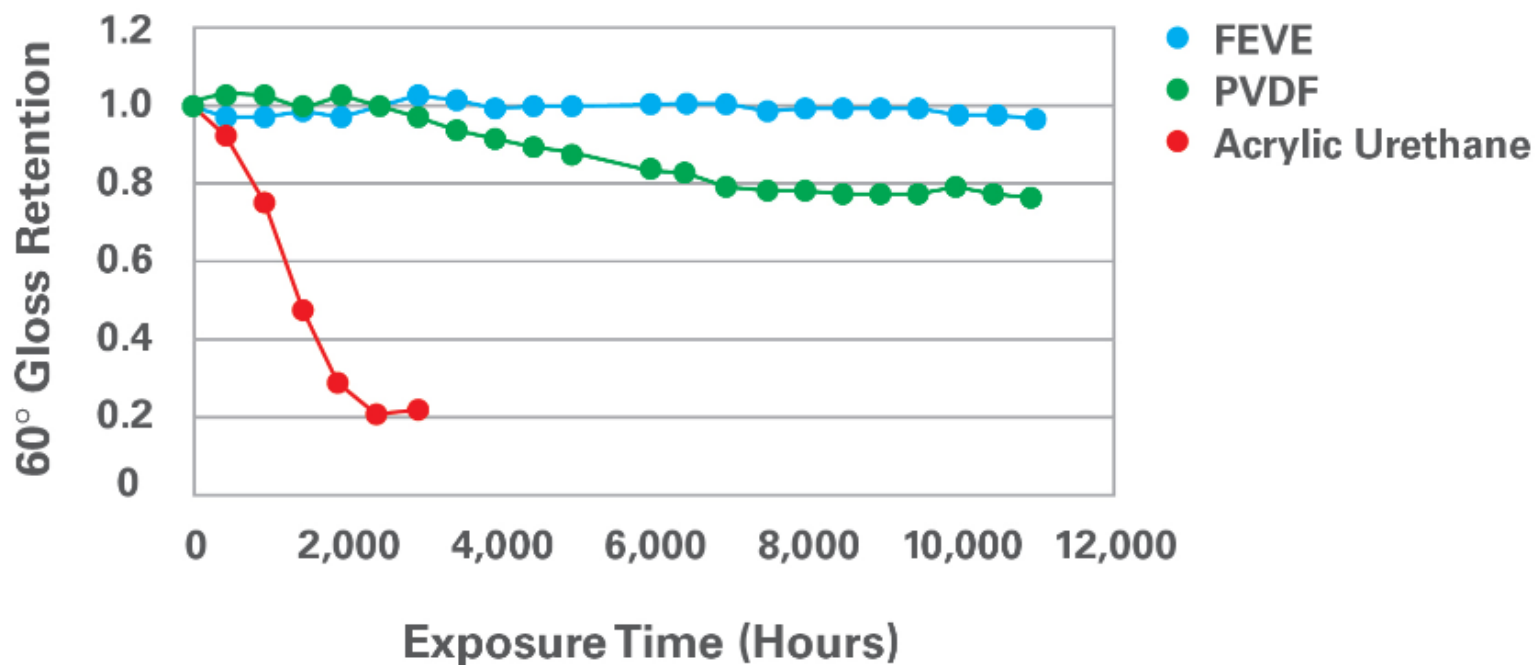
GLOSS RETENTION (WHITE)

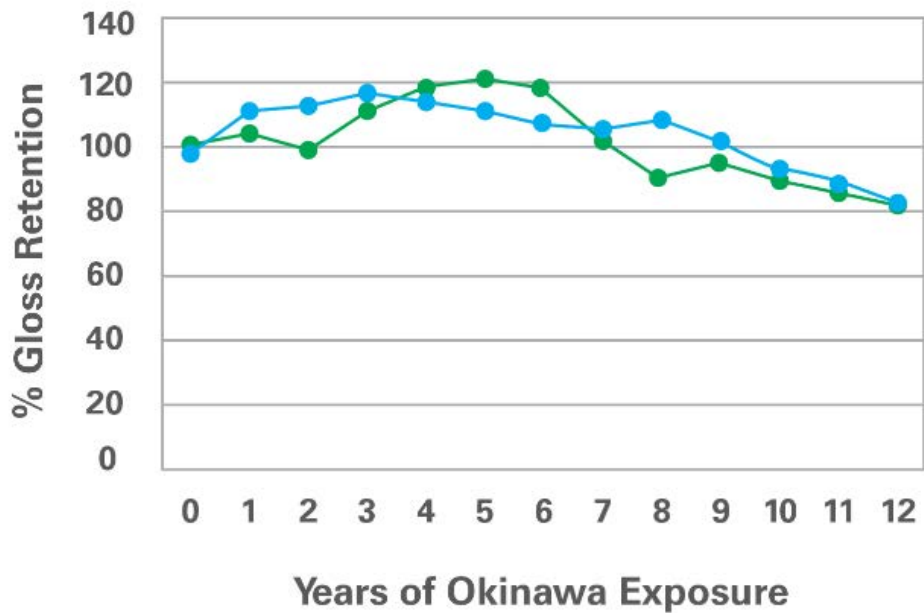
EMMAQUA 2,800 mJ/m²



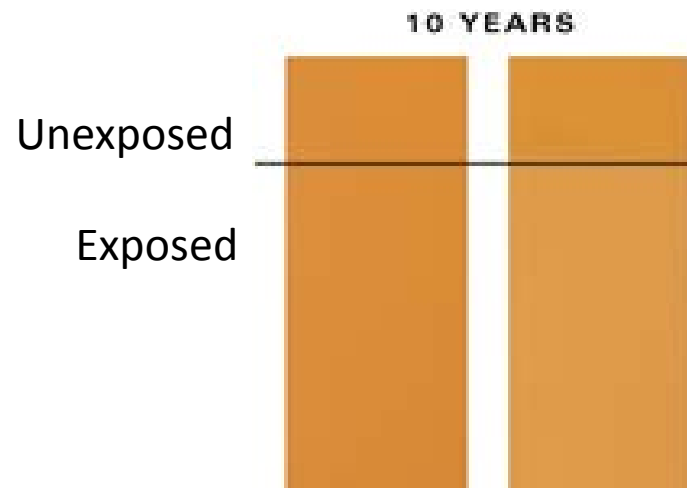
GLOSS RETENTION (WHITE)

Xenon Arc 11,000 Hours





● FEVE Coating
● PVDF Coating



Left: FEVE Coating
Right: PVDF Coating

FEVE vs. PVDF Comparison

FEVE COATINGS	PVDF COATINGS
Thermoset Polymer Better mechanical properties	Thermoplastic Polymer Poor mar resistance Higher elongation
Bright, clean, crisp colors Wide range of gloss	Limited colors Low to medium gloss
Ambient or Elevated Temperature Cure Versatility in application – Shop or Field Easy to repair and recoat	Elevated Cure Temperature – Baked Shop application only Poor recoatability
Unique Chemical Structure Weatherability derived from structure Better corrosion resistance without primer	Fluoropolymer/Acrylic Blend % fluorine drives weatherability Acrylic degrades over time



COLOR CONSIDERATIONS

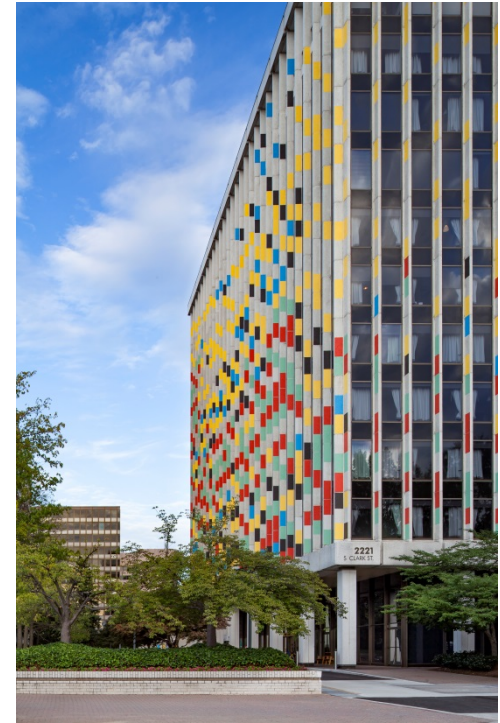
Color Pigments


- FEVE coatings allow for greater pigmentation options due to usage of organic pigments to achieve brighter colors and can also provide reflective benefits



Features of Reflective Coatings

- Aesthetics - Allows for darker/brighter colors with a wide variety of design flexibility
- Can provide reduced exterior surface temperatures on roofs and walls
- Cooler surface temperature reduces polymer degradation within the paint film, allowing for a longer life-cycle

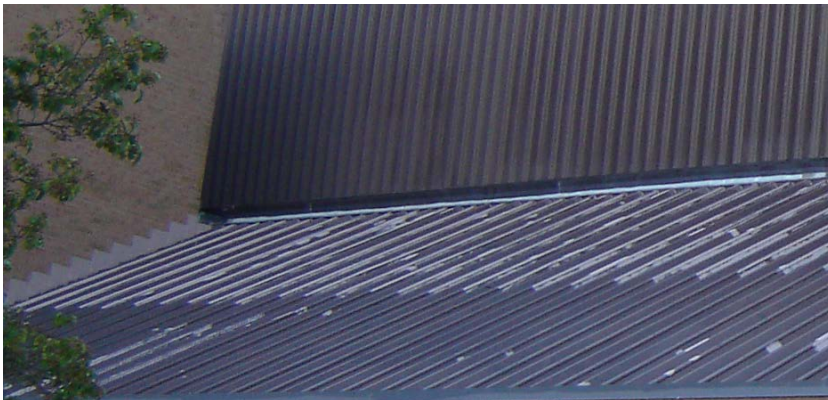




SELECTING A SUCCESSFUL OVERCOAT SYSTEM

Factors that Determine Overcoat Success

- Evaluate the current condition of the existing coating system
- Determine a viable method of surface preparation
- Evaluate the geographic location (exposure conditions)
- Consider properties of various coating types



Adhesion / Film Integrity

+

Geographic Location

+

Existing Film Thickness



DELAMINATION RISK FACTOR

Delamination Risk Factor

+

Cohesive Stress Factor



CANDIDATE OVERCOAT SYSTEM

Candidate Overcoat System

+

Test Patch Evaluation

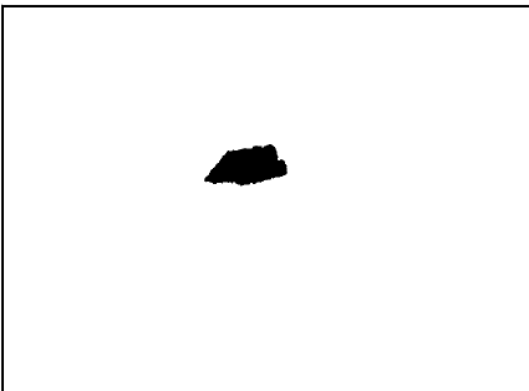


SUCCESSFUL OVERCOAT SYSTEM

Existing Coating Condition Assessment

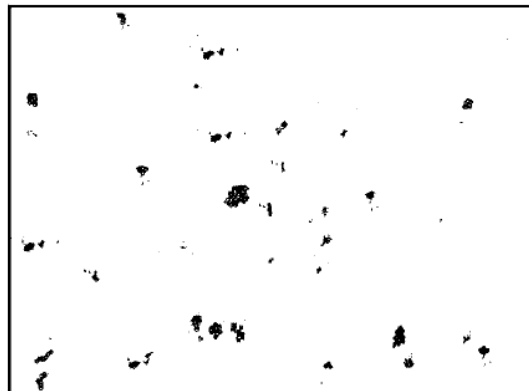
- Degree of Rust
 - ASTM D610 – Evaluating Degree of Rusting on Painted Steel Surfaces

SPOT RUSTING



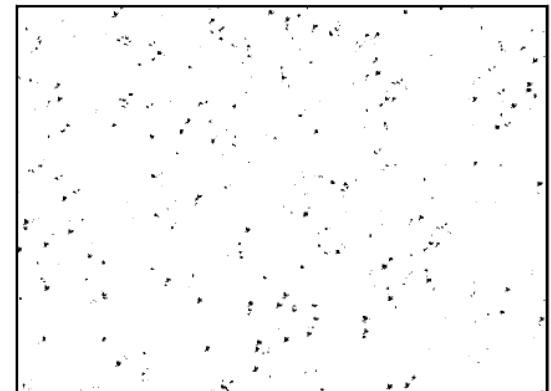
Rust Grade 6-S, 1% Rusted

GENERAL RUSTING



Rust Grade 6-G, 1% Rusted

PINPOINT RUSTING



Rust Grade 6-P, 1% Rusted

Existing Coating Condition Assessment

- Adhesion
 - ASTM D3359 – Measuring Adhesion by Tape Test



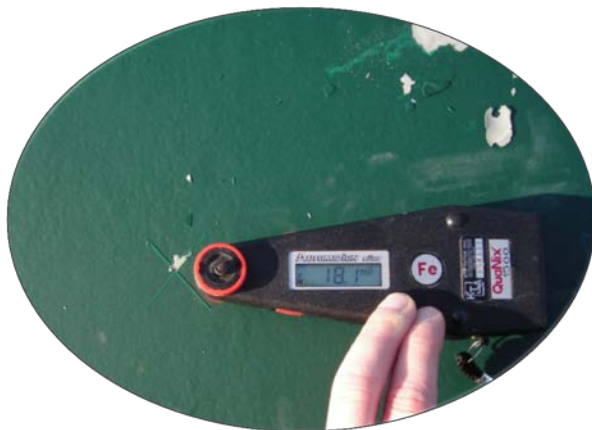
Existing Coating Condition Assessment

- Adhesion
 - ASTM D6677 – Evaluating Adhesion by Knife



Adhesion / Film Integrity

- What is the total film thickness?
- How many coats of paint?
- How good is the adhesion to the substrate and between coats?
- Are there film defects such as cracking or blistering





Surface Preparation Options

- Abrasive blast methods generally not feasible
 - Thin-gage steel will warp
 - Surrounding area not conducive
- Other means of scarification
 - Power tool options
 - Hand sanding
- Water Jetting Standards
 - SSPC WJ-1 through WJ-4
 - Range of cleanliness definitions
 - Various pressure requirements



Overcoat System Selection — Primers

- Epoxies

EPOXIES	EPOXY MASTICS
Best Corrosion Protection	Low Cure Stress
Highest Cure Stress	Good Corrosion Protection
Highest Degree of SP Required	Power Tool SP Sufficient
	Limited Use below 50°F

Overcoat System Selection — Primers

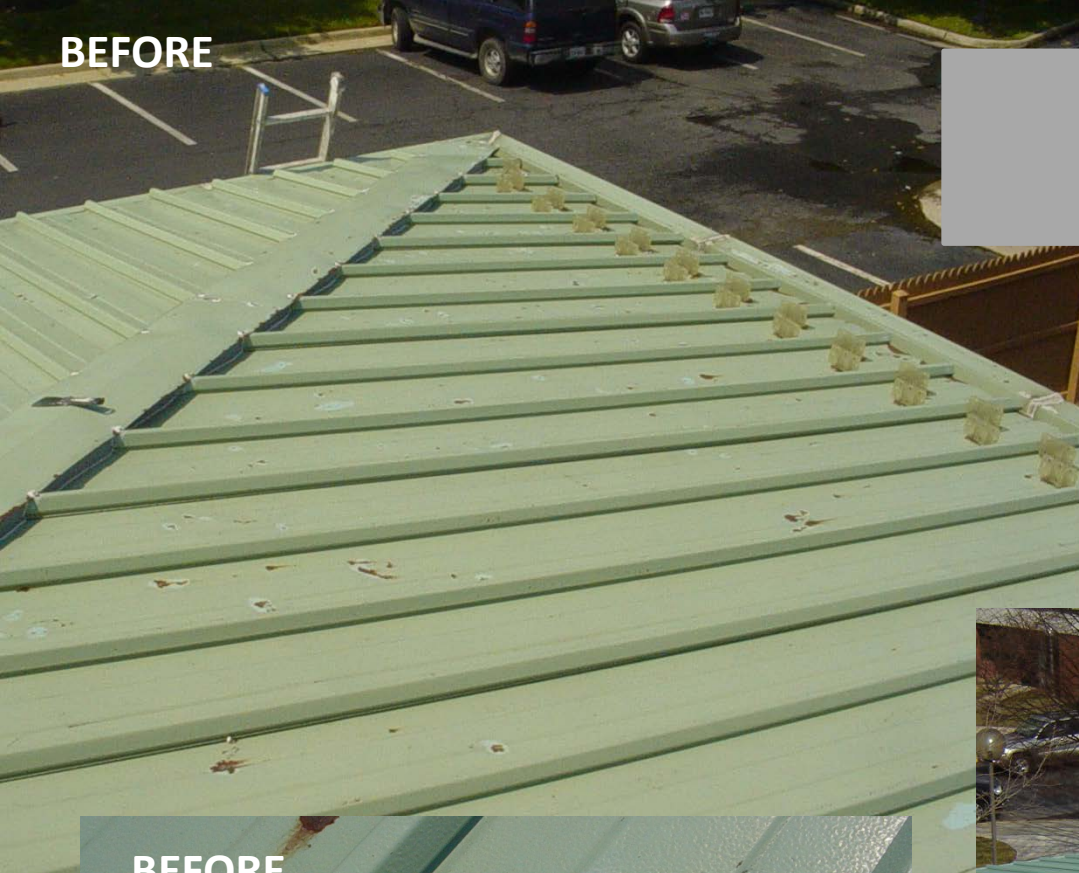
- Acrylics vs. Acrylic Mastics

ACRYLICS	ACRYLIC MASTICS
No Cure Stress	No Cure Stress
Power Tool SP Sufficient	Good Corrosion Protection
Limited topcoat selection	Least Restrictive Means of SP (SSPC-WJ Standards)
	Wide selection of topcoat performance
	Limited use below 40°F

CASE STUDIES

Overcoating Aged Metal Cladding and Roofing with High-Performance Coatings

BEFORE



CORPORATE CENTER FAIRFAX, VA

BEFORE



AFTER



CONVENTION CENTER LAS VEGAS, NV



AFTER

STADIUM ATLANTA, GA



BEFORE



AFTER

YOUTH CIVIC CENTER WORCHESTER, MD



BEFORE



LIBRARY ROOF SHORELINE, WA



COIL-COATED ROOF OVERCOAT

CATHEDRAL COLORADO SPRINGS, CO

BEFORE

AFTER



Closing Thoughts...

- Restoring with a field-applied high-performance coating system is a cost-effective alternative to replacing roof and wall panels
- With any overcoat project, a test patch is highly recommended
- Tests show that FEVE coatings made with high quality resins can offer the same weatherability as PVDF coatings
- For an evaluation of your aged metals roof and wall panels, contact your local high-performance coating manufacturers for a coating evaluation

QUESTION & ANSWER SESSION

Thank you for participating!