WELCOME BCBEC TO THE AIBC APPROVED CLASS ON FINISHES AND AAMA SPECIFICATIONS

THE WONDERFUL WORLD OF SPRAY PAINTING ON ALUMINUM SURFACES

COMPOSITION OF PAINT

RESIN

-BACKBONE OF PAINT

-POLYMERIC SUBSTANCE THAT FORMS THE FILMS

Paint resin

PIGMENT

- COLOR
- HIDING POWER
- GLOSS
- CORROSION PROTECTION

Paint pigments

ADDITIVES

-SPECIAL EFFECTS

(D.F.T. properties) -Flexibility

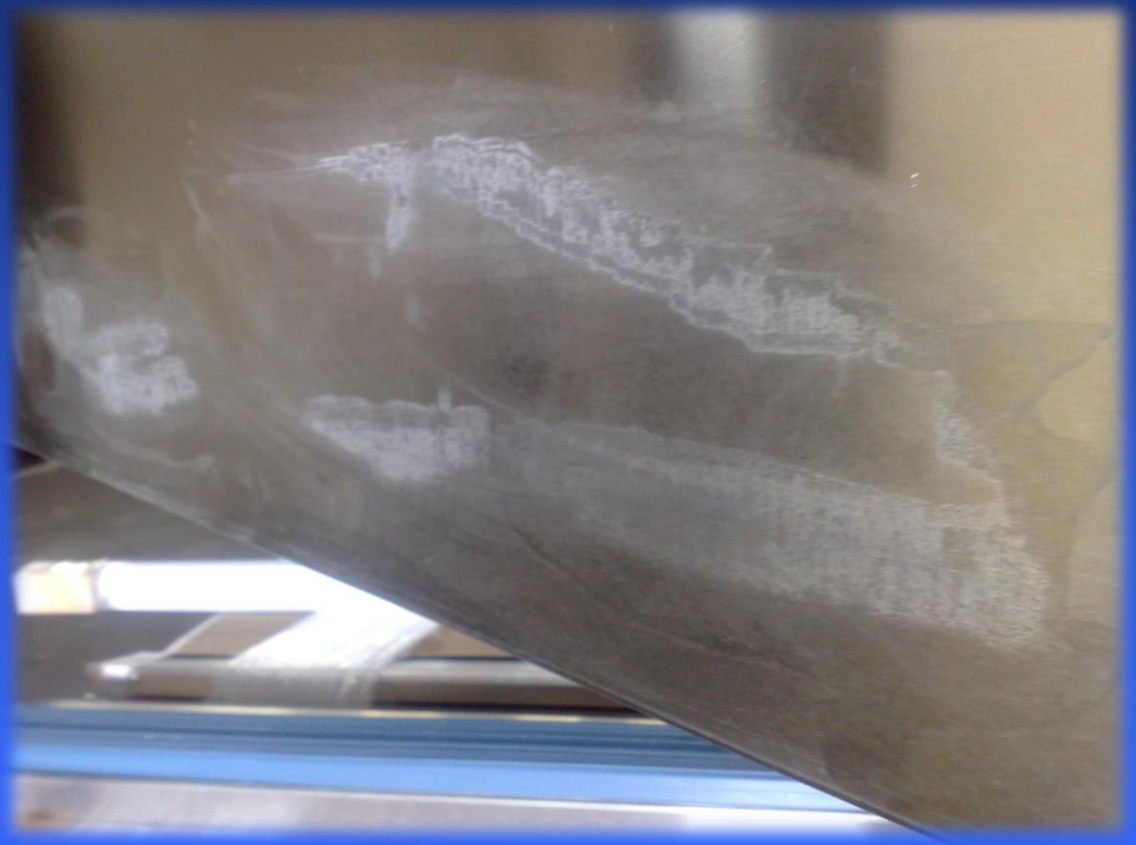
-Gloss

WHY COAT ALUMINUM?

1. COLOR (aesthetics)
2. PROTECTION (environmental damage)

Color – aesthetics

Example of corroded aluminum



MAJOR ENEMIES TO COATINGS

UV RADIATION -

Degrades chemical bonds resulting in color fade, chalking and film erosion.

Faded paint due to UVradiation

MOISTURE -

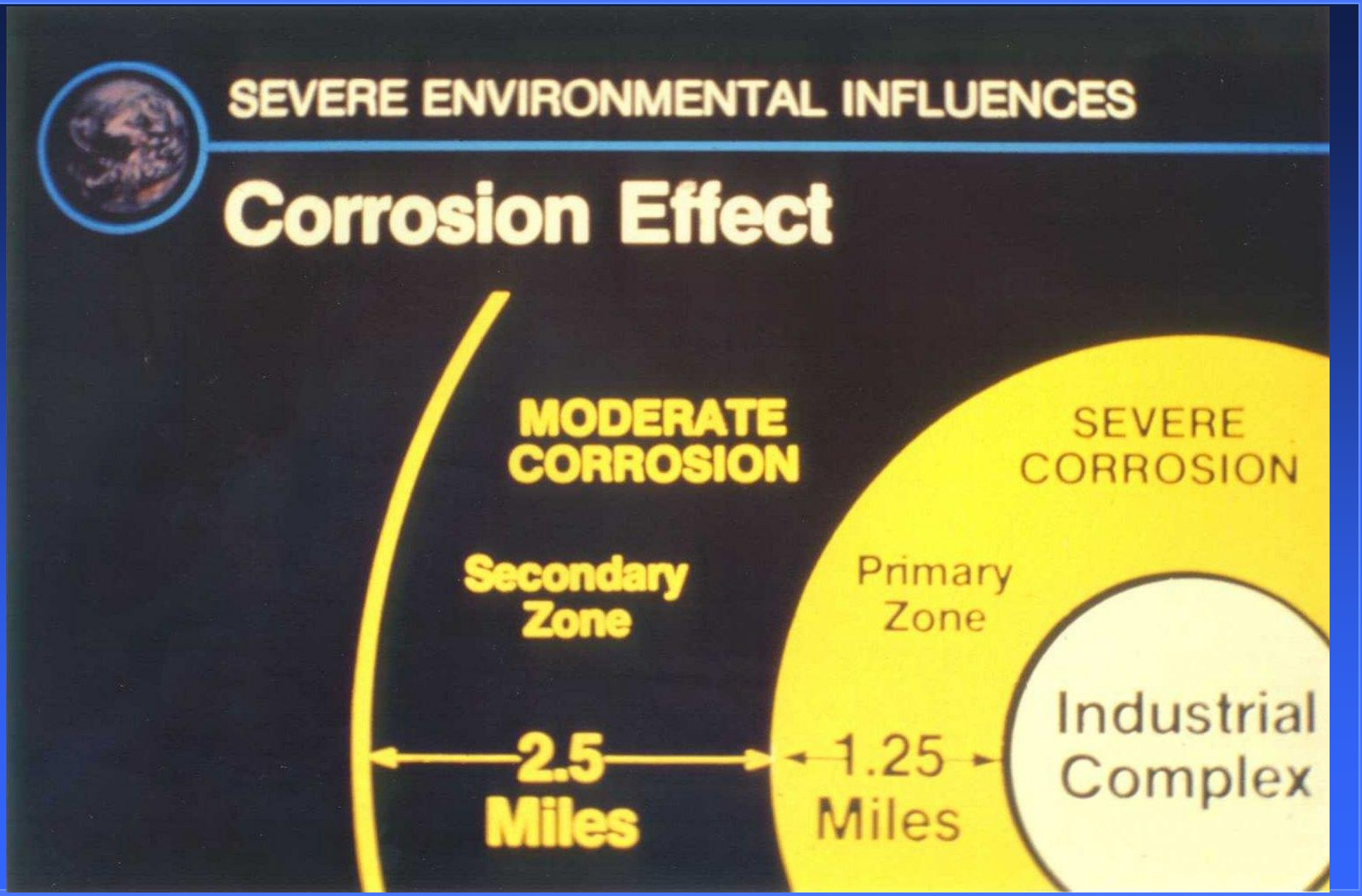
Contributes to the breakdown of binder on the film's surface; can also penetrate the film causing adhesion loss or substrate corrosion.

TEMPERATURE -

Higher temperatures can accelerate the effects of UV and moisture on the paint film. Excessive swings in temperature can increase stress that leads to loss of film integrity or adhesion.

AGGRESSIVE ENVIRONMENTS

Acid rain, industrial pollutants & salt can all affect film appearance or corrosion protection.


SEVERE ENVIRONMENTAL INFLUENCES
Corrosion Effect
MODERATE CORROSION
Secondary Zone
2.5 Miles
SEVERE CORROSION
Primary Zone
1.25 Miles
Industrial Complex

PHYSICAL DAMAGE -

Scratches during transit or installation contribute to corrosion sites.

Example of physical damage

PRETREATMENT (ADHESION & CORROSION)

BASICALLY A 5 TO 7 STAGE PROCESS

- CLEAN
- RINSE
- CHROMATE OR CHROME FREE CONVERSION COATING

- RINSE
- RINSE
- **PRETREATMENT IS CRITICAL TO LONG TERM PERFORMANCE & ADHESION**

Corrosion Resistance

Chemically Converted & Painted Aluminum

- Excellent Corrosion Resistance
- Excellent Exterior Durability

Warranty for PVDF Coatings

Same product, but different warranty?

Pre-treatment

Chromate Phosphate Pretreatment
Versus
Non Chrome Pre-treatment

Location of project

Coastal region versus inland

Coastal region is considered anywhere within a 1 mile radius from the coast

PPG Industries 20-Year Limited Warranty
DURANAR®, DURANAR® SUNSTORM, DURANAR® XL, AND DURANAR® XLBC
STANDARD COLORS – SPRAY APPLIED

Effective Date: **January 01, 2010**

WARRANTY TABLES

DURANAR®, DURANAR® SUNSTORM, DURANAR® XL AND DURANAR® XLBC WITH CHROME PHOSPHATE PRETREATMENT

Warranty in years for all Exposure Conditions			
Type of Environment or Location	Film Integrity (Years)	Color ΔE ≤ 5.0 (Years)	Chalking ≥ 8 Rating (Years)
Residential, Commercial and School – Buildings used for habitation Distribution Centers, Hotels, Shopping Malls, Office Buildings Assembly Factories and Schools located in rural or residential areas	20	20	20
Industrial – Steel mills, Power Generating Stations, Oil Fields, Oil Refineries, Ore Mines, Chemical Plants, Paper Mills, or other unusual environmental exposure	20	20	20
Severe Marine – Within one mile of salt water	20	20	20

DURANAR®, DURANAR® SUNSTORM, DURANAR® XL AND DURANAR® XLBC WITH CHROME-FREE PRETREATMENT

Warranty in years for all Exposure Conditions			
Type of Environment or Location	Film Integrity (Years)	Color ΔE ≤ 5.0 (Years)	Chalking ≥ 8 Rating (Years)
Residential, Commercial and School – Buildings used for habitation Distribution Centers, Hotels, Shopping Malls, Office Buildings Assembly Factories and Schools located in rural or residential areas	10	10	10
Industrial – Steel mills, Power Generating Stations, Oil Fields, Oil Refineries, Ore Mines, Chemical Plants, Paper Mills, or other unusual environmental exposure	10	10	10
Severe Marine – Within one mile of salt water	No Warranty	10	10

THIS WARRANTY IS FOR PRODUCTS USED IN ALUMINUM EXTRUSION SPRAY APPLICATIONS ONLY

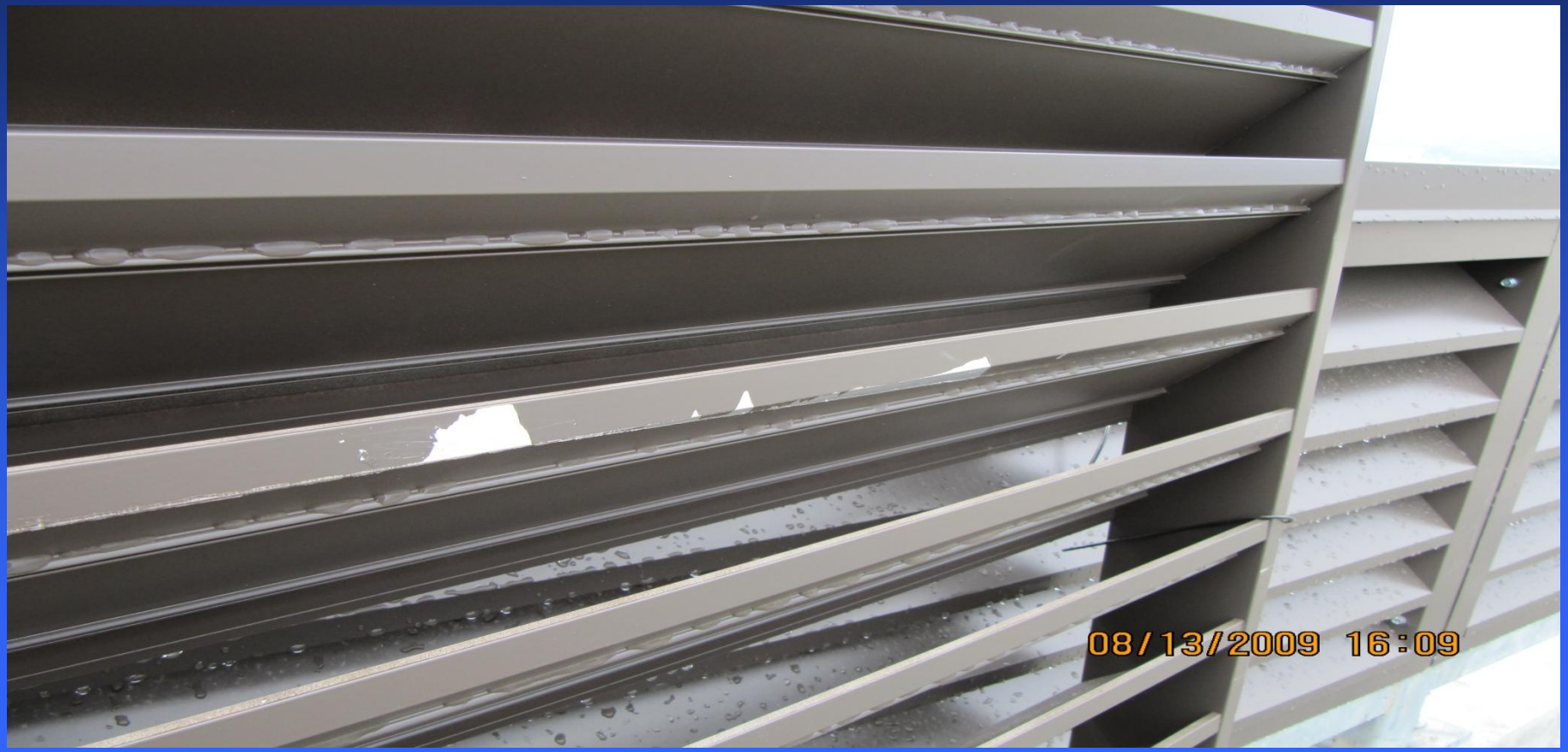
THIS LIMITED WARRANTY APPLIES ONLY TO PRODUCTS SOLD BY PPG INDUSTRIES AND APPLIED TO METAL THAT IS USED IN THE CONTINENTAL UNITED STATES, ALASKA, CANADA, AND MEXICO (HAWAII AND THE CARIBBEAN EXCLUDED) unless PPG INDUSTRIES specifically and in writing notifies the Customer otherwise prior to sale of the Product

AD
Initial
03/24/10
Date

PPG INDUSTRIES retains the right to determine the Environmental Location condition during a warranty investigation and may deem the specific warranty performance based on close proximity to one of the severe environmental conditions noted above.

PPG Industries
5875 New King Ct.
Troy, Michigan 48098
Telephone (248) 641-2078

Paint failure due to improper pretreatment



DRY OFF OVEN

Note: Surfaces to be painted must be clean, pretreated, and dry to ensure paint adhesion.

PAINT BOOTHS/TURBO DISC AND/OR GUNS

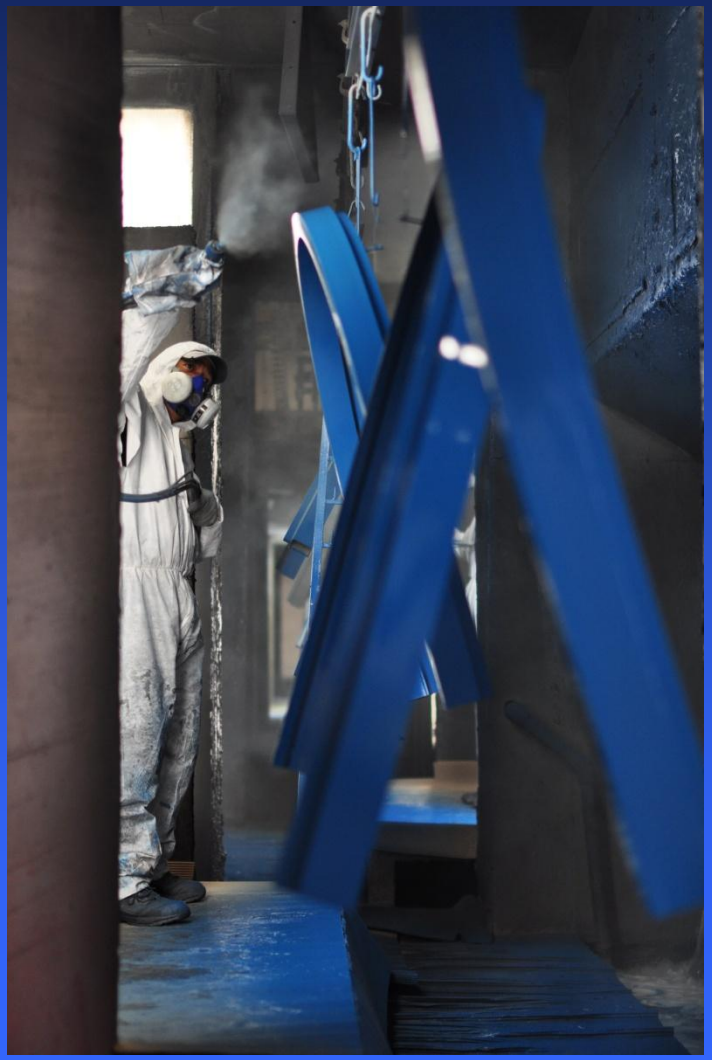
ELECTROSTATIC SPRAY DEPOSITION (action of electrostatic field): the movement of electrically charged paint droplets along lines of force which exist between an electrically charged spray gun and a grounded part.

Atomization of paint:

- Air
- Airless
- Rotational Techniques

VERTICAL EXTRUSION LINE

HORIZONTAL EXTRUSION LINE



CURE

BAKING THE COATED PARTS:

Specified time & temperature ensures coating performance characteristics are achieved.

Parts going through the curing oven

COOL DOWN TIME

Ensures no damage to painted parts.

CURRENT ALUMINUM SPRAY COATINGS SPECIFICATIONS

THE AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION

(AAMA)

(Voluntary)

AAMA 2603-02

D.F.T. min. exposed area:	.8 mils
Color change:	slight
Outdoor exposure time:	1 yr. South Florida
Chalking resistance:	slight
Film adhesion:	dry & wet
Chemical resistance:	muriatic acid / mortar resistant
Corrosion resistance:	-1500 hr. Salt Spray 1500 hr. 100% humidity

AAMA 2604-05

- D.F.T. min. exposed area: 1.2 mils
- Color change: no more than 5 Delta E
- Outdoor exposure time: 5 yrs. South Florida

MIN. GLOSS RET. 30%

FILM EROSION LESS THAN 10%

FALLING SAND MIN. 20

- CHALKING RESISTANCE: no more than #8 ASTM
- FILM ADHESION: dry & wet adhesion /boiling water
- CHEMICAL RESISTANCE: muriatic acid/ mortar resistance/ nitric acid
- CORROSION RESISTANCE: 3000 hrs. Salt Spray 3000 hrs. 100% Humidity

AAMA 2605 – 05

Outdoor exposure time: 10 yrs. South Florida

Corrosion resistance: 4000 hrs. Salt Spray
4000 hrs. 100% Humidity

D.F.T. min. exposed area: 1.2 mils.

Chalk 8 (6 whites) / Color - 5 delta e max.

Min. gloss ret. 50% /Film erosion less than 10%

Falling sand min. 40/Chem.Resis: muriatic acid/ mortar resistance/nitric acid

NO LONGER PRESCRIPTIVE

ACRYLICS

- One coat (primer would enhance corrosion properties)
- AAMA 2603
- Low solids - high V.O.C.
- Color range - extensive
- Gloss: 5-85 degrees, 60 degree gloss meter
- Pencil hardness - H+

ACRYLICS

ADVANTAGES:

Good film integrity, indoor color retention and exterior durability.

POLYESTERS

- One coat (primer would enhance corrosion properties)
- AAMA 2603
- High solids - low V.O.C.
- Color range - extensive
- Gloss: 5-85 degrees, 60 degree gloss meter
- Pencil hardness - H+

POLYESTERS

ADVANTAGES:

Good film integrity, indoor color retention and exterior durability.

50% PVDF

- TWO COAT
- AAMA 2604
- COLOR RANGE - NO EXOTICS/NO METALLICS (MICA ONLY) NO REDS
- GLOSS - 25 - 35 DEGREES, 60 DEGREE GLOSS METER
- PENCIL HARDNESS: MINIMUM F

50% PVDF

- EASY WET-ON-WET APPLICATION
- GREAT AESTHETICS
- EXCELLENT CORROSION RESISTANCE
- SERVICE LIFE IN EXCESS OF 10 YEARS **WHEN USING CHROME PRETREATMENT**

NAMES FOR 70%

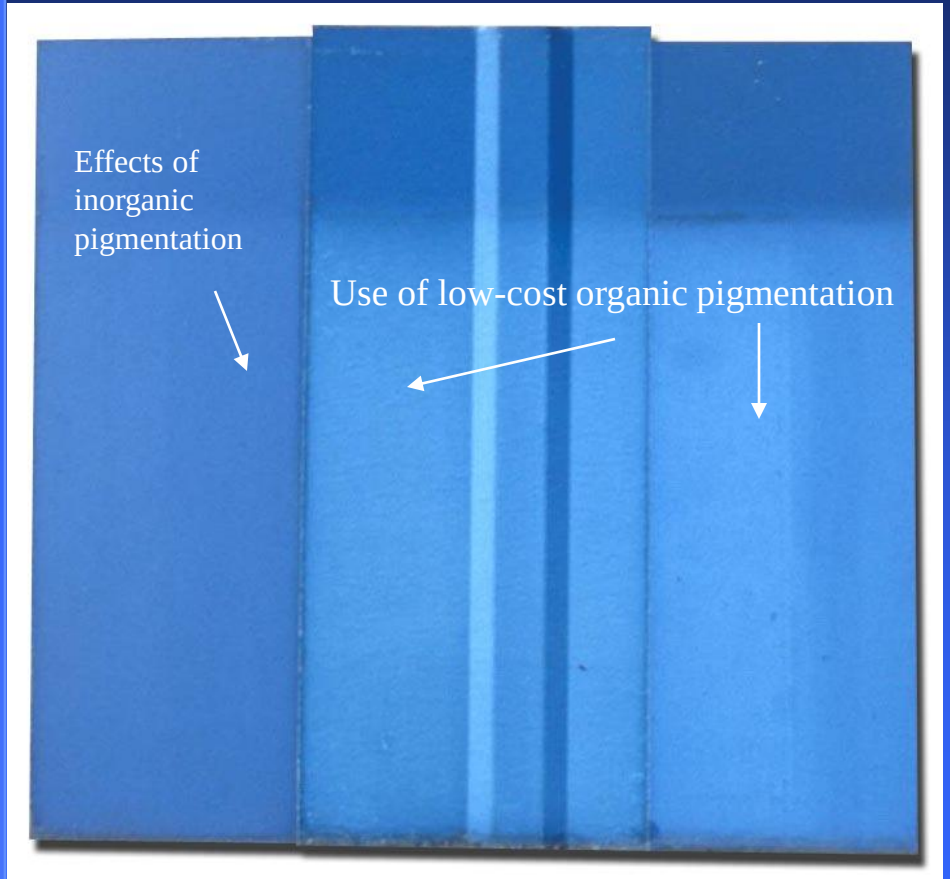
- HYLAR 5000 KYNAR 500
- POLYVINYLIDENE FLUORIDE
- PVDF
- PVF_2
- FLUOROPOLYMER
- FLUOROCARBON

FLUOROPOLYMERS

- 70% two coat (could be 3-4, color dependent)
- AAMA 2605
- Low solids - High V.O.C.
- Color range - limited
- Pencil hardness - F to H

Why use Fluoropolymer

6 years - 45º S. South FL

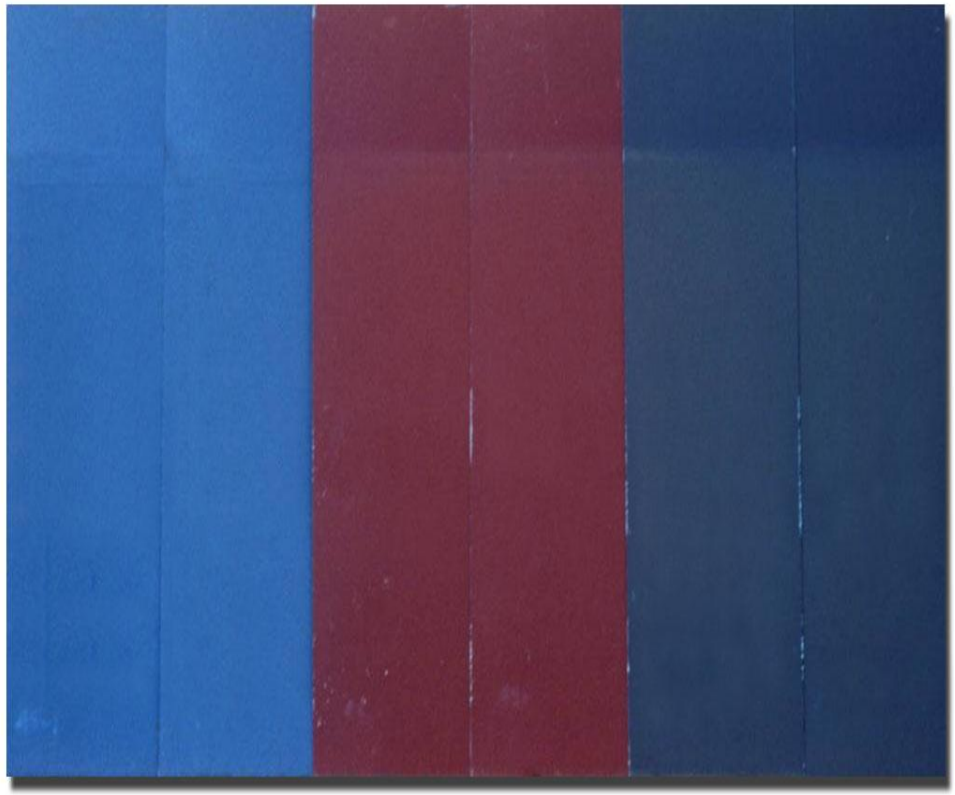


•There are a wide variety of coatings offered to the industry that range from weak to very good performance. The choices made by paint manufacturers, with cost as a significant driver, with respect to resins and pigments have a very significant affect on the life performance of the paint finish. Fluoropolymer paints utilize the best ceramic /inorganic pigmentation available low-cost organic pigments.

•“You get what you pay for.”

Why use Fluoropolymer

13 years - 45º S. South FL
Less than 2 NBS Unit Fade



Real world testing and UV exposure continues to provide proof that Fluoropolymer-based (PVDF) coatings will provide decades of durability. These test panels prove our point.

(Equivalent to 26-32 years, roof exposure, generally anywhere in North America.)

FLUOROPOLYMER ADVANTAGES

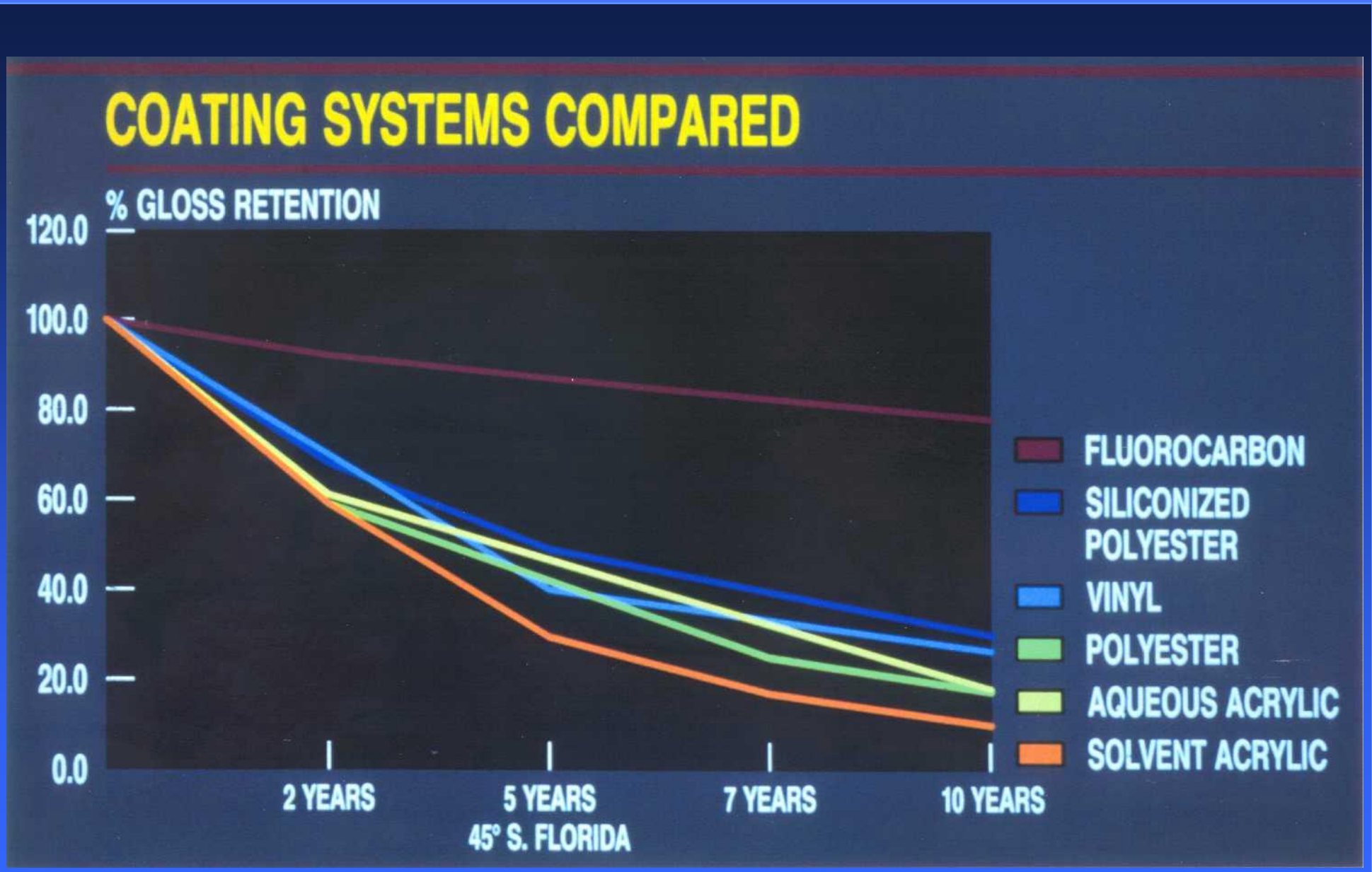
- Ultimate durability
- Longest color life and chalk resistance*
- Superior corrosion resistance
- Flexible
- Chemical resistance
- SERVICE LIFE IN EXCESS OF 20 YEARS **WHEN USING CHROME PRETREATMENT**

*Based on proper pigment selection

SOUTH FLORIDA TEST SITE OVER 30,000 PANELS AT THIS SITE

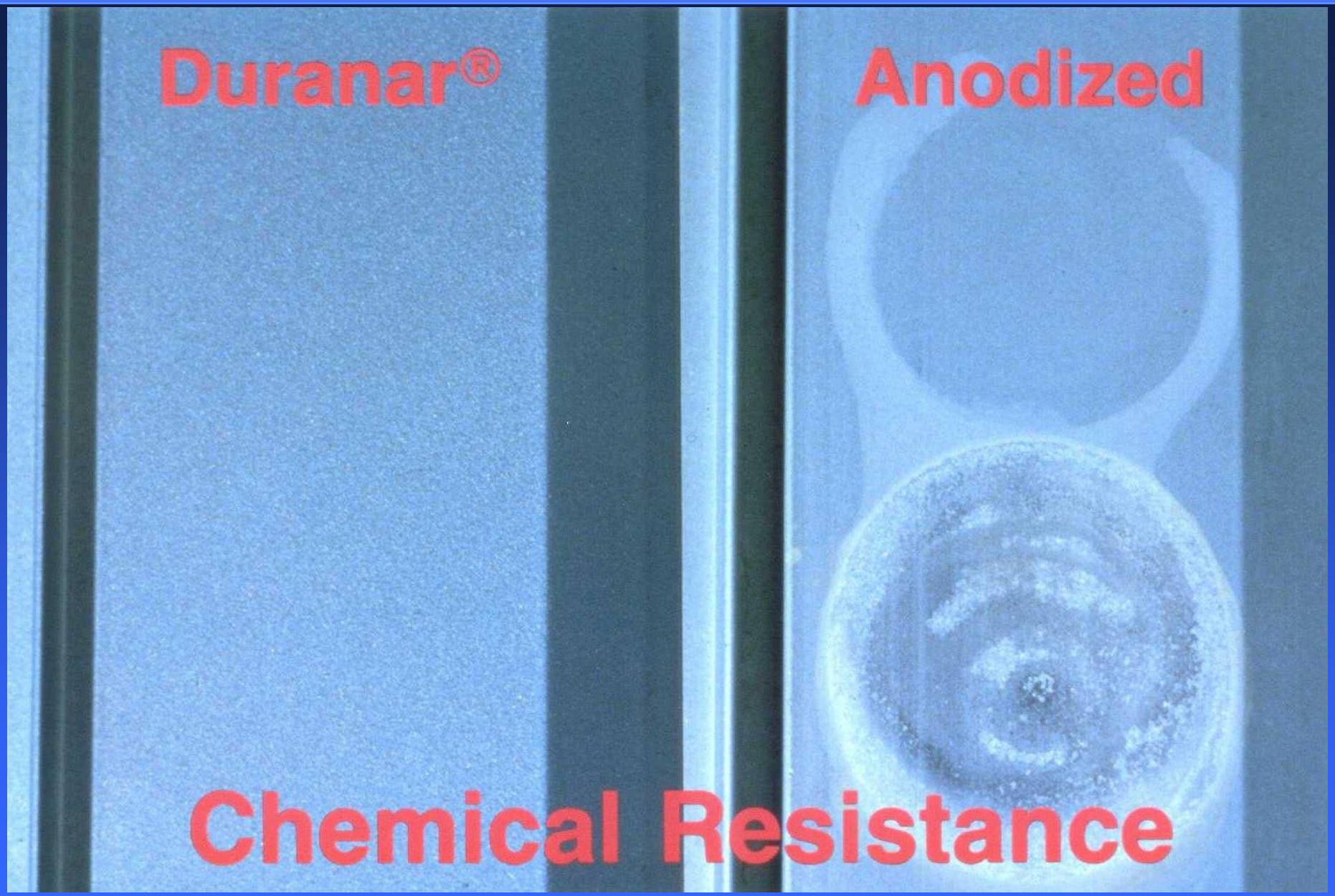
Accelerated Weathering

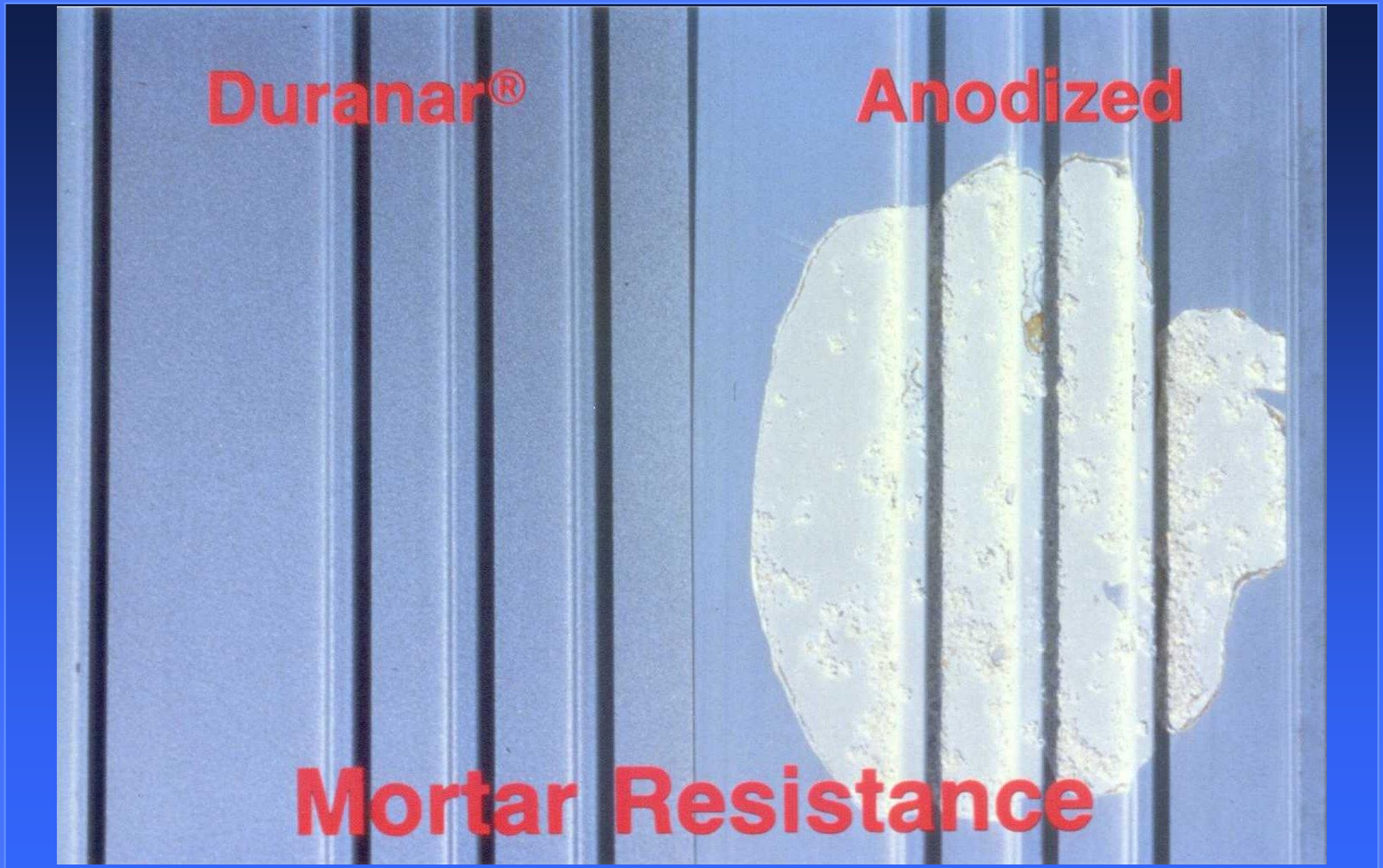
- Weatherometer (QUV Chamber)
  - Intense *artificial* light with heat and moisture
- Emmaqua – Equatorial Mount with Mirrors for Acceleration with Water
  - Magnifies effects of the *natural* sun light with mirrors & induced moisture


COATING SYSTEMS COMPARED
% GLOSS RETENTION
120.0
100.0
80.0
60.0
40.0
20.0
0.0
2 YEARS
5 YEARS
7 YEARS
10 YEARS
45° S. FLORIDA
FLUOROCARBON
SILICONIZED POLYESTER
VINYL
POLYESTER
AQUEOUS ACRYLIC
SOLVENT ACRYLIC

HIGH PERFORMANCE FLUOROPOLYMER VS. HARD-COAT ANODIZING

1. **More color**
2. **Better color uniformity, batch to batch**
3. **Better alkali resistance - mortar does not adhere**
4. **Better chemical resistance to organic acids**
5. **Performs better in high salt**
6. **Low maintenance - wash with water and detergent solution**
7. **Color stability**
8. **Touch-up capability**


Duranar®
Anodized
Chemical Resistance


Duranar®
Anodized
Mortar Resistance

"Winners almost always compete by delivering a product that supplies superior value to customers, rather than one that costs less."

From "Searching for Excellence"

Industry Week Magazine

Cornell - New York

Adidas headquarters “Portland, Oregon”

Empire State Building - New York

Olympic Village - Vancouver

NY Building - New York

J. Paul Getty Museum - Los Angelas

EMP
Experience Music Project - Seattle

Statue of Liberty - New York

United Nations - New York

Science World - Vancouver

Thank you for your attention and attending this presentation