Vibrantz Functional Pigments for Powder Coatings & Anticorrosive Coatings

Patricia Perez – CICP & Anticorrosives Global product manager

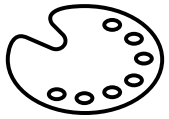
1st PCE & 1st PLA, Milano February 2026

We bring color, performance and vibrancy to life.

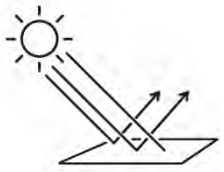
PIGMENTS

Pigments are insoluble substances mixed into a medium to provide

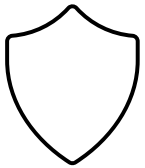
color… and/or other functionalities



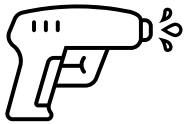
COLOR
Heat Fastness
Chemical Fastness
Weathering Fastness



Colored “Cool” surfaces
IR reflectance



Corrosion protection
Long term protection of metal surfaces



Application efficiency
Transfer efficiency and penetration

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Pigments with enhanced color Heat Resistance

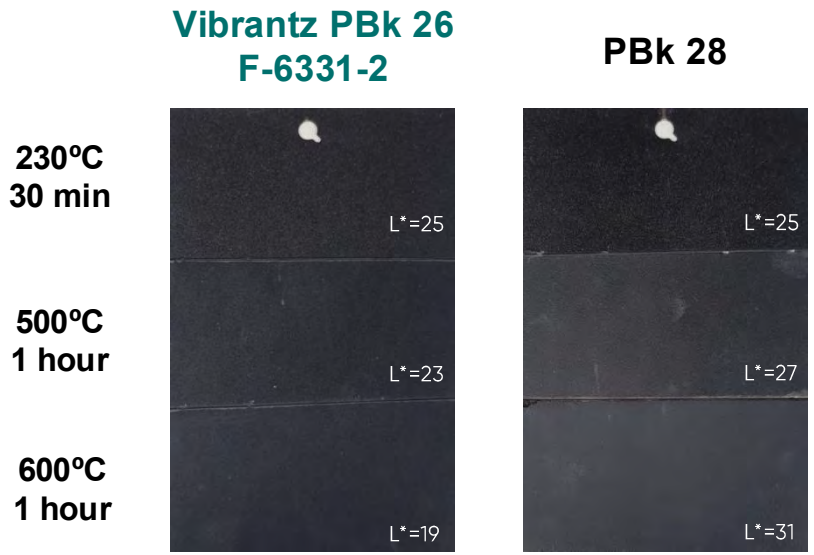
PY184 Bismuth Vanadate

	10’ 180 °C	10’ 220 °C	30’ 220°C
Standard BiVa	Reference	1,89	15,43
Vibrantz 6610B	Reference	0,64	1,77

PE-Primid Powder Coating
(DE* vs curing 10’ 180ºC)

6610B
BiVa with the highest heat fastness & overbaking

PBk26 Manganese Ferrite



Silicone Powder Coating

F-6331-2
The deepest black shade at high temperatures

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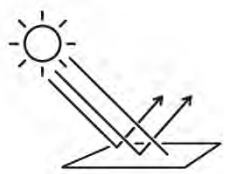
Colored “Cool” surfaces

IR Reflecting Pigments Technology



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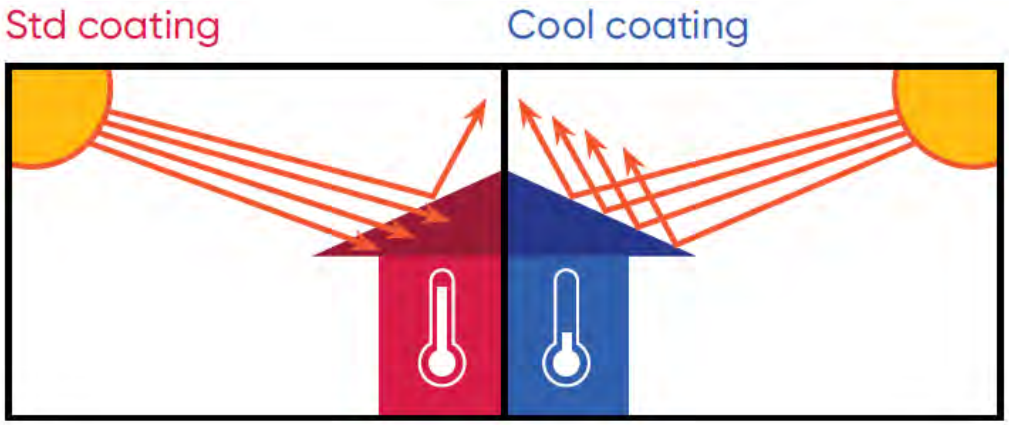
A cost-effective solution

Infrared reflecting technology “Cool” surfaces



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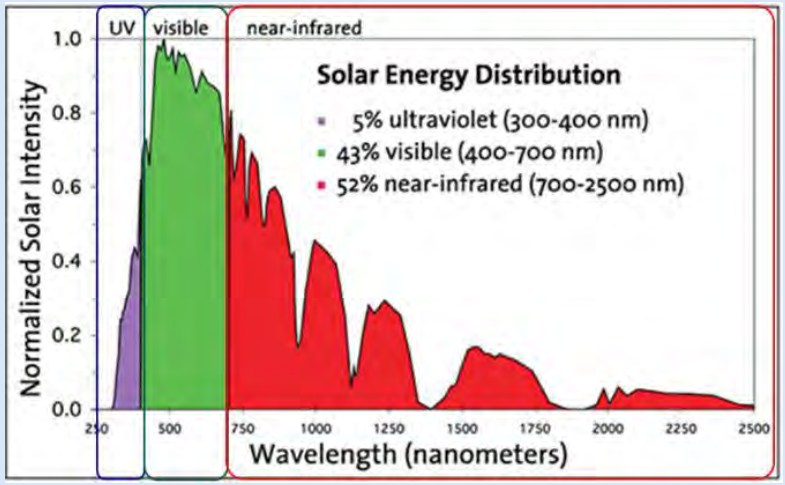
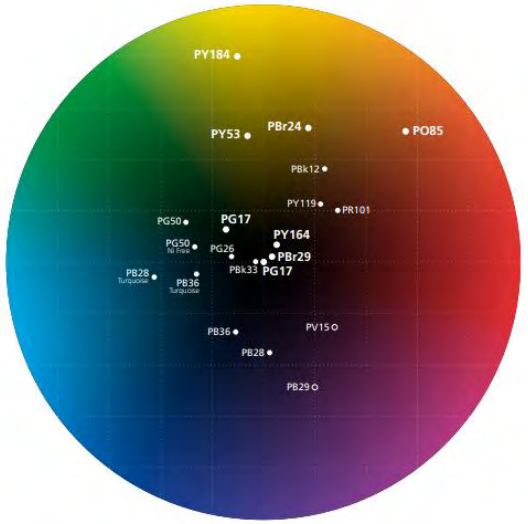
NIR reflecting color pigments

Color pigments absorbs visible, but also NIR



Use of NIR Reflecting pigments



Color space	Color Index	NIR Reflectance
Black	PBr29	High
	PG17	High
	PBk33	Moderate
Brown	PY164	High
	PBr24	High
	PY119	Moderate
Yellow	PY53	High
	PY184	High
Orange	PO85	High
Red	PR101	Moderate
Green	PG17	High
	PG26	Moderate
	PG50	Moderate
Blue	PB28	Moderate
	PB36	Moderate
	PB29	Transparent
Violet	PV15	Transparent

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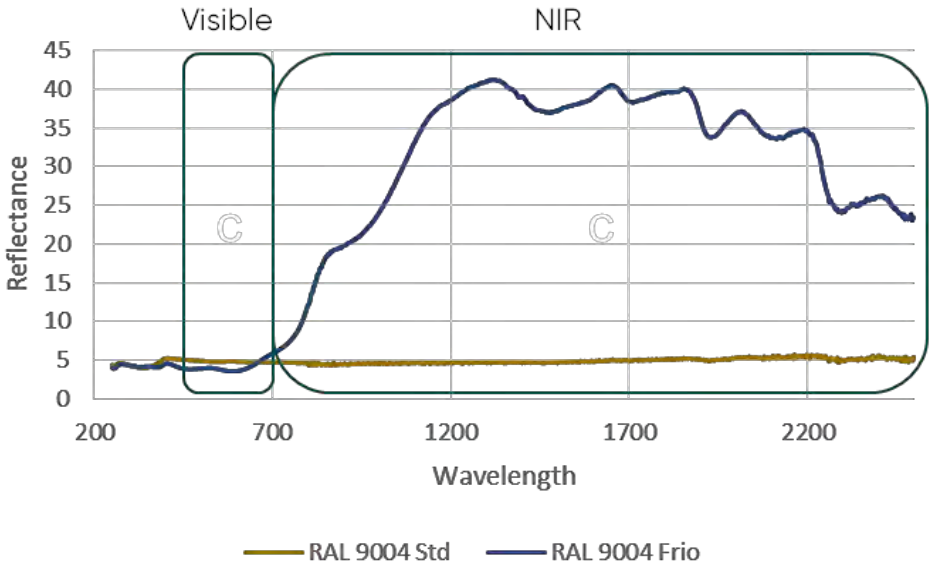
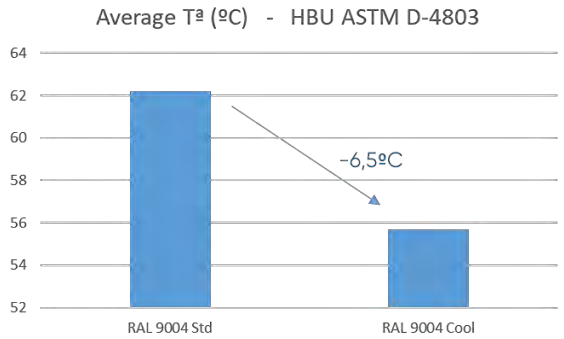
Dark surfaces can achieve highest surface temperature



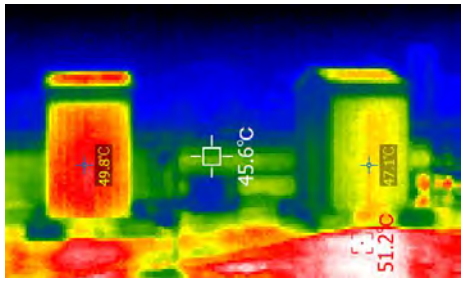
- Carbon Black (PBk 7) and Black Iron Oxide (PBk 11) absorb in all spectrum
- **NIR Reflecting Black pigments:**
  - PBr 29: Chrome Iron Brown Hematite
  - PG 17: Chromium Green-Black Hematite
  - Strontium Manganese Oxide: **New Eclipse Black 372**

What is the impact on AC savings in buildings?

Heat Build Up (HBU) – ASTM D4803



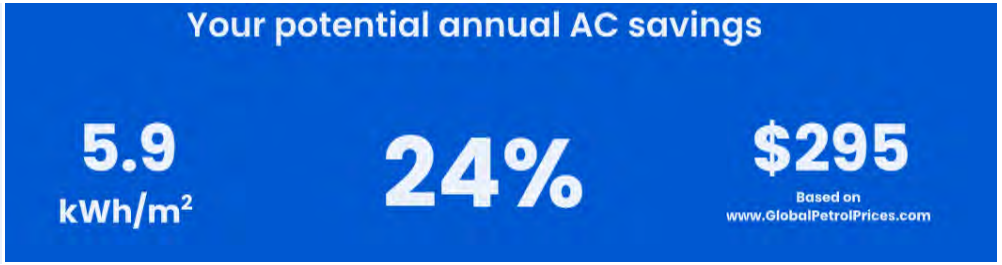
Garden Houses case study



20% average AC saving

July-October 2023

Energy Savings computer modeling simulation



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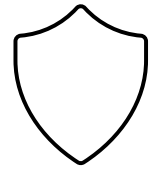
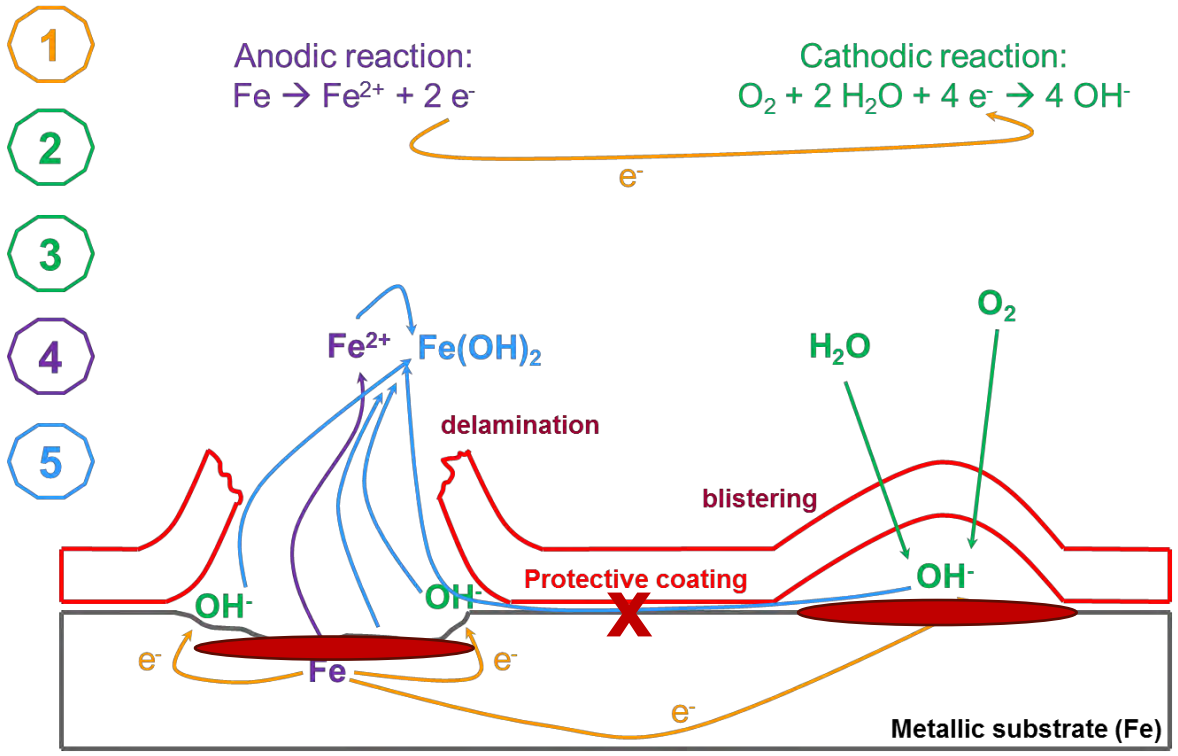
Corrosion Protection

Long term protection of metal surfaces with Anticorrosive Pigments



Anticorrosive pigments mechanism: chemical composition



Anticorrosive pigment mechanism based on chemical composition:

- **Cathodic inhibition**: formation of basic oxides of Zn, Ca, Sr
- **Anodic passivation**: formation of phosphate complexes of Zn, Ca, Sr, Fe

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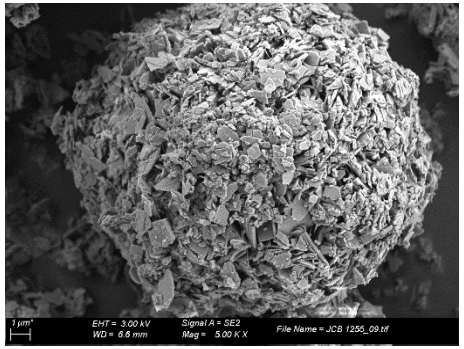
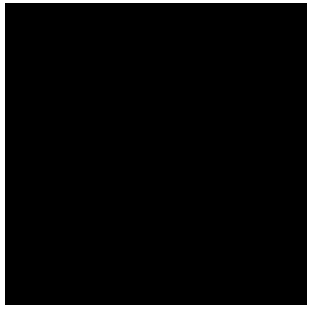
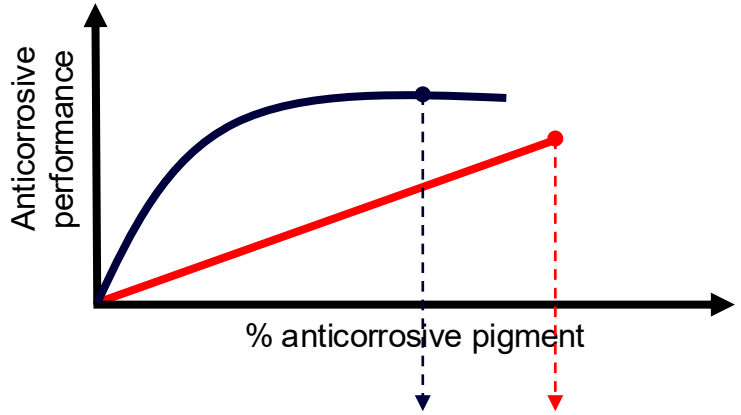
Anticorrosive pigment mechanism: physical shape

Zinc phosphate: same chemistry but different physics

	Nubirox N2 Conventional Zinc Phosphate	**Nubirox SP** Special particle Zinc Phosphate
		
Particle size	8-12 µm	**< 1 µm (aggregate 4-10 µm)**
		
Specific surface:	1 m^2/g	**8-15 m^2/g**



4% Nubirox SP

6% Conventional Zinc Phosphate

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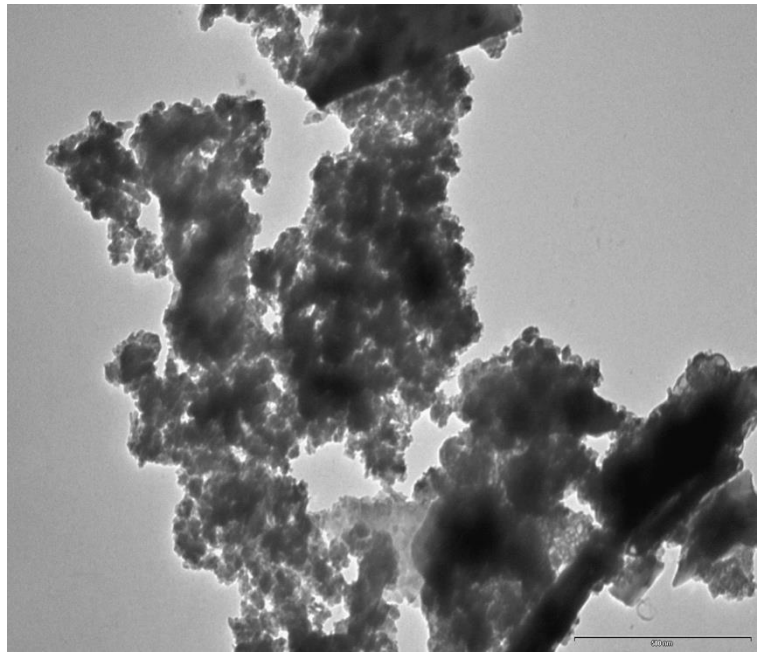
Anticorrosive pigment mechanism: particle design

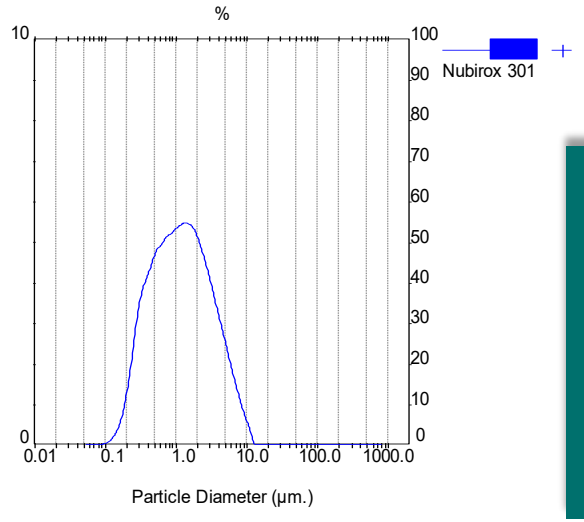
Core-shell pigments

Nubirox 300 series: Calcium Strontium Phosphosilicate



SEM (scanning electron microscope)

Particle size distribution



D(v,0.5)=1.15 µm

Specific surface area: 21 m^2/g

Nubirox 301 & 302

- Non Zinc based pigments
- Good performance in glossy DTM applications

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Anticorrosive pigments for Powder Coatings

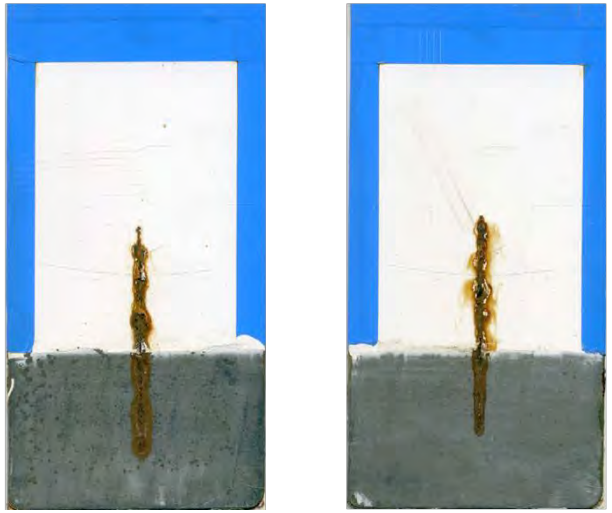
Modified Zinc Phosphates in Epoxy-Polyester Powder Coating

Phosphated Steel

Substrate: Standardized phosphated steel panels (Bonderite 1000) Dry film thickness: ~90µ	1000 hours in Salt Spray (ASTM B-117)

2,3% in volume / 5,0% total formula weight

Without anticorrosive pigment	Nubirox 102



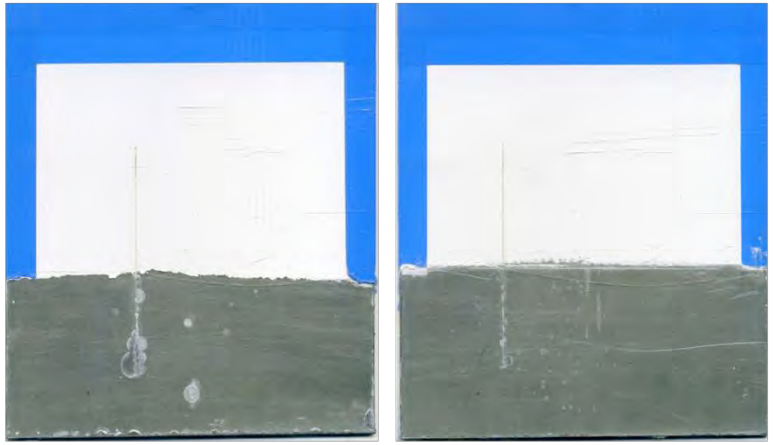
PANEL EVALUATION	Control	Nubirox 102
Rusting at the scribe (ASTM D1654)	6 (3mm)	7 (2mm)
Rusting on the panel (ASTM D610)	8G (0.1%)	9G (0.03%)
Adhesion at the scribe (ASTM D1654)	10	10
Adhesion "cross cut" (ASTM B3359)	5B	5B
Blistering (ASTM D714-02)	None	None

Galvanized Steel

Substrate: Standardized HD galvanized (Gardobond 1303H 62 OE) Dry film thickness: ~70µ	2000 hours in Salt Spray (ASTM B-117)

2,3% in volume / 5,0% total formula weight

Without anticorrosive pigment	Nubirox 102



FORMULA PC 16467 *FORMULA PC 16471*

PANEL EVALUATION	Control	Nubirox 102
Rusting at the scribe (ASTM D1654)	5 (3.5mm)	7 (1.5mm)
Rusting on the panel (ASTM D610)	6G (1%)	8G (0.1%)
Adhesion at the scribe (ASTM D1654)	10	10
Adhesion "cross cut" (ASTM B3359)	5B	5B
Blistering (ASTM D714-02)	4F	4F

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Anticorrosive pigments for Powder Coatings

Modified Zinc Phosphates in Epoxy-Polyester Powder Coating

Aluminium

Substrate: Standardized aluminum 3105H14 panels (AA015D) Dry film thickness: ~90µ	4000 hours in Salt Spray (ASTM B-117)

2,3% in volume / 5,2% total formula weight

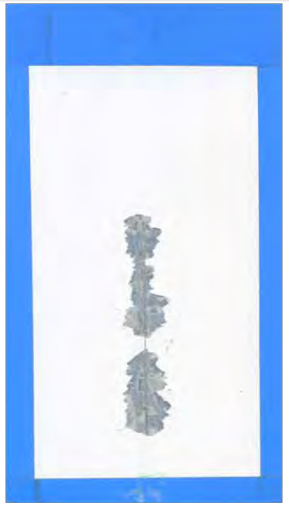
Without anticorrosive pigment	Nubirox 106
	
FORMULA PC 16440	*FORMULA PC 16444*

PANEL EVALUATION	Control	Nubirox 106
Rusting at the scribe (ASTM D1654)	7 (1.5mm)	9 (0.5mm)
Rusting on the panel (ASTM D610)	6G (1%)	9G (0.03%)
Adhesion at the scribe (ASTM D1654)	10	10
Adhesion "cross cut" (ASTM B3359)	5B	5B
Blistering (ASTM D714-02)	None	None

Substrate: Standardized aluminum 3105H14 panels (AA015D) Dry film thickness: ~75µ	500 hours in CASS Test (ASTM B-368 Cupro Acetic Salt Spray)

2,3% in volume / 5,2% total formula weight

CASS test salt solution:
5% Sodium Chloride + 0.25g/L Copper Chloride Dihydrate
Acetic acid to pH 3.1-3.3
Solution atomized in a cabinet at 49ºC

Without anticorrosive pigment	Nubirox 106
	
FORMULA PC 16440	*FORMULA PC 16444*

PANEL EVALUATION	Control	Nubirox 106
Rusting at the scribe (ASTM D1654)	5 (5mm)	6 (2.5mm)
Rusting on the panel (ASTM D610)	9G (0.03%)	9G (0.03%)
Adhesion at the scribe (ASTM D1654)	2 (13mm)	5 (5mm)
Adhesion "cross cut" (ASTM B3359)	5B	5B
Blistering (ASTM D714-02)	2F	4F

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Application efficiency

Transfer efficiency and penetration improvement with Functional Pigments

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Powder Coatings Application

Applying powder coatings can sometimes be difficult…

- Not all the sprayed powder is charged and deposited
- Reclaimed powder of lower quality
- Difficult to apply in corners

KA100 promotes powder-charging characteristics in powder coatings based on its dielectric behavior.

- high first pass transfer efficiency
- coating homogeneity
- high penetration in Faraday cage areas.

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KA100: Powder coating deposition efficiency

Transfer efficiency

Control

+1% KA100

White Polyester-HAA powder coating in CRS
Application with corona spray gun in same conditions (time/distance)

	Paint weight in panel (g)	% vs Control
Control	1,7	
+1% KA100	2,5	+51%

	Film thickness (up/mid/bottom)	% vs Control
Control	29µ/23µ/30µ	
+1% KA100	45µ/50µ/60µ	+109%

KA100 improves quantity of paint added and film thickness

-> Lower cost of paint application: waste, time and energy savings up to 20%

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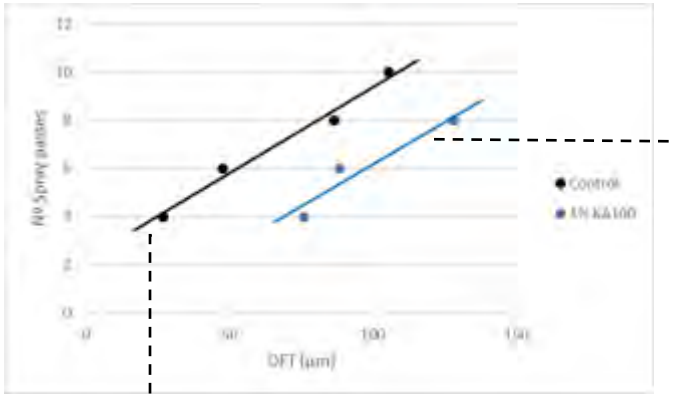
KA100: Powder coating deposition efficiency

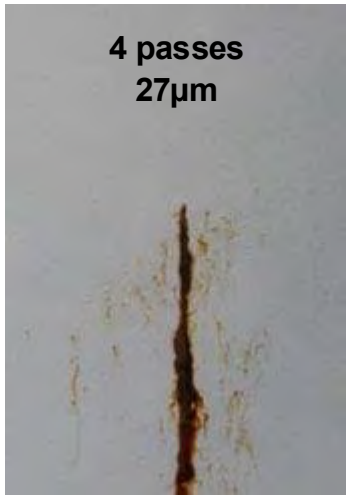
Thickness and homogeneity

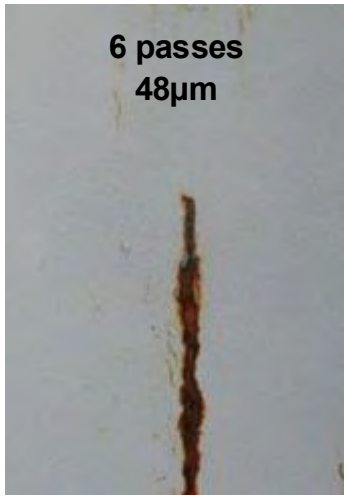


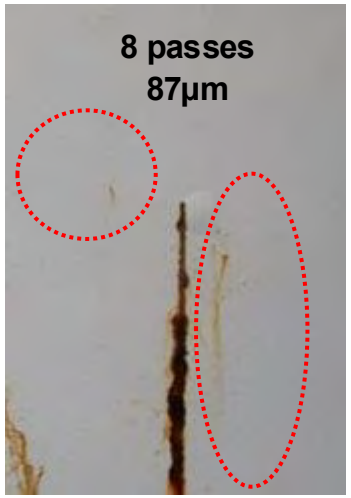
Transfer efficiency in cold rolled steel: Salt Spray test (ASTM B-117) 530 hours

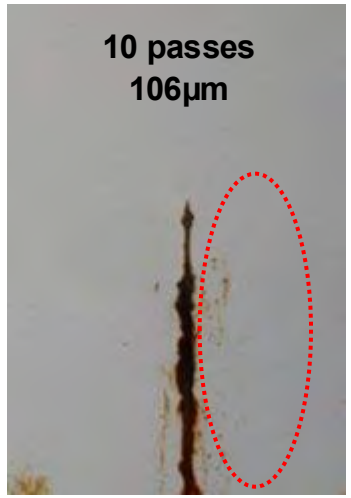
+1%KA10
0

Control









KA100 provides better homogeneity provides better barrier protection

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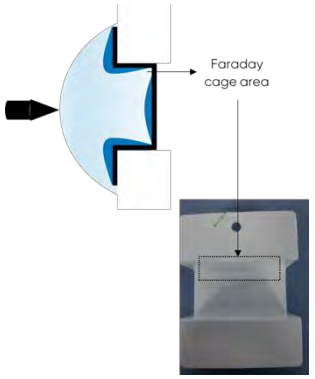
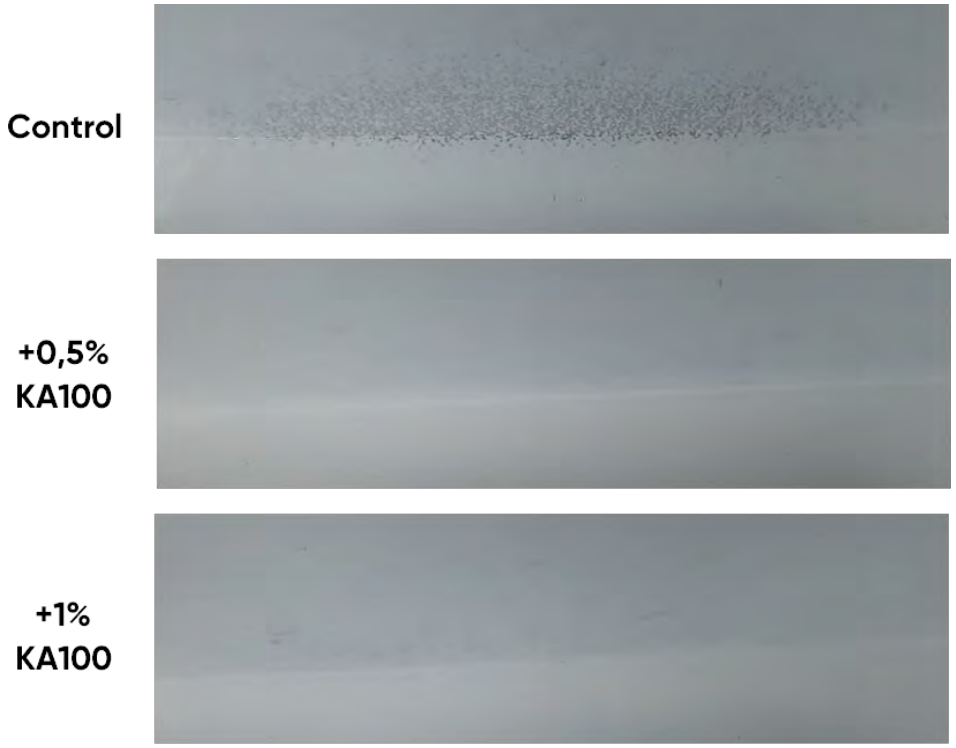
KA100: Powder coating deposition efficiency

Penetration in Faraday Cage areas





Application with corona spray gun in same conditions (time/distance)

	Film thickness					
	Mean (µm)			% vs Control		
Product	**Up**	**Mid**	**Bottom**	**Up**	**Mid**	**Bottom**
Control	93	52	139			
0,5% KA100	139	95	148	+50%	**+82%**	+7%
1% KA100	147	106	269	+59%	**+103%**	+94%

KA100 improves coverage in corners and areas of difficult penetration

-> Better corrosion protection in corners

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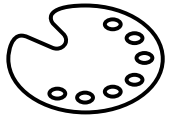
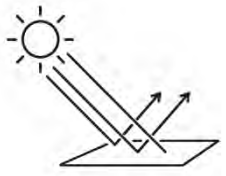
SUMMARY

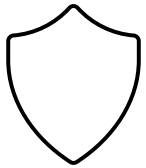
Pigments provide color… and/or other functionalities



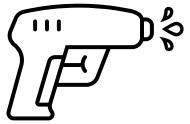
Pigments with **enhanced color Heat Resistance**:
- PY184 (6610B): BiVa with the highest heat fastness & overbaking
- PBk26 (F-6331-2): The deepest black shade at high temperature



Pigments with **IR Reflecting "Cool" properties** that reduce surface temperature improving comfort, reducing AC usage in buildings and extending durability of exterior materials.



Pigments for **Corrosion Protection** based on different:
- Chemical composition
- Physical shape
- Particle design



Pigments for **Powder Coating deposition efficiency** (KA100)
- High first pass transfer efficiency
- Coating homogeneity
- High penetration in Faraday cage areas.

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