Zeocros E110 – An Efficient TiO_2 Extender for Powder Coatings

INTRODUCTION

Zeocros E110 is a Sodium Aluminosilicate designed for use as a TiO_2 extender to maintain Optical Brightness and Opacity in a Powder Coatings Application. Through careful design and control of absolute particle size, distribution and angular morphology (see electron micrograph right), **Zeocros E110** can replace significant amounts of TiO_2 in a Powder Coatings application without negatively effecting Optical Performance. This is of particular importance to the Powder Coating manufacturer as this fast expanding market segment utilizes high levels of TiO_2. However, to-date, the technical demands of powder coating systems have excluded the majority of TiO_2 extenders commercially available.

Zeocros E110 is manufactured at a high purity level which imparts excellent brightness in both Whites and Non-White Powder Coatings Systems. A typical product data table is shown below (left). Trials conducted with Epoxy/Polyester Hybrid have shown that up to 25% of TiO_2 (by weight) can be replaced without negatively effecting gloss, brightness, UV stability and mechanical properties. Moreover in Non-White Coatings, the use of **Zeocros E110** increases the intensity of the color without affecting color balance thus requiring less expensive pigments (TiO2) to achieve the same shade as the non-extended coating. This is estimated to reduce ~5 to 10% on color pigment use (both organic and inorganic) while providing a significant effect on cost savings.

Typical Zeocros E110 Characteristics	
Average Particle Size (µm)	2.0
Oil Adsorption (g/100g)	40 - 50
Colour (Harrison)	99
Purity % (dry basis)	>99.9
S.G. (g/cm^3)	2.3
Mohs Hardness	2 - 3
Moisture loss (105°C) %	<1

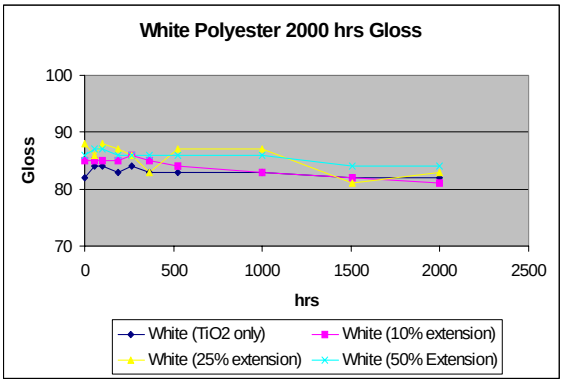
The data table below illustrates the use of **Zeocros E110** in a Hybrid Epoxy Polyester Powder Coatings Formulation.

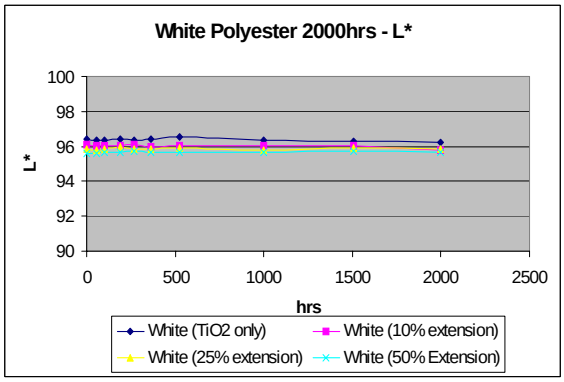
TECHNICAL DATA FOR POLYESTER PRIMID SYSTEM

	100% TiO_2 (reference)	10% Extension	25% Extension	50% Extension	Blue Pigmented Reference	Blue 25% Extension	Yellow Pigmented Reference	Yellow 25% Extension
Formulation (% w/w)								
UCB V7630	60	60	60	60	60	60	60	60
Primid XL552	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
PV88	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Benzoin	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
AW10	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Kronos 2310	30	27	22.5	15	10	7.5	10	7.5
Zeocros E110	0	3	7.5	15	0	2.5	0	2.5
Blue BG	0	0	0	0	3	3	0	0
Oxide YW3910	0	0	0	0	0	0	3	3
Gloss								
10mins @ 350° F	96	100	100	100	96	96	94	94
Color								
ΔL*	Std	-0.23	-0.27	-0.53	Std	-2.13	Std	-1.98
Δa*	Std	0.02	0.05	0.08	Std	2.26	Std	0.43
Δb*	Std	-0.29	-0.32	-0.09	Std	0.87	Std	1.29
ΔE	Std	0.37	0.42	0.54	Std	3.23	Std	2.40
Contrast Ratio								
50µ	98%	98%	96%	96%	100%	100%	97%	97%
90µ	100%	99%	98%	98%	100%	100%	98%	98%
Impact: 40 inch/lb								
Category	3	1	1	1	2	2	2	1
Flow								
Category	2	2	2	2	2	2	2	2
Cupping Test								
Pass	7mm	7mm	7mm	7mm	7mm	7mm	7mm	7mm
Notes on Processing								
	Higher Zeocros E110 loading permits faster processing due to slight reductions in high shear melt viscosity. Positive Effects are also noted on cure as E110 also reduces low shear melt viscosity reducing negative cure effects such as orange peel.							

UV STABILITY DATA (Polyester-Primid System)

UV stability data is generated from exposure of 100µm film thickness sprayed, cured panel to a xenon daylight emission spectrum using Q-Sun equipment. Rates of coating UV deterioration of extended samples (up to 25%) are not significantly different from a non-extended system. No deleterious effects on whiteness levels (as well as a* and b*) are observed. In addition, the stability of color pigmented systems remains unaffected





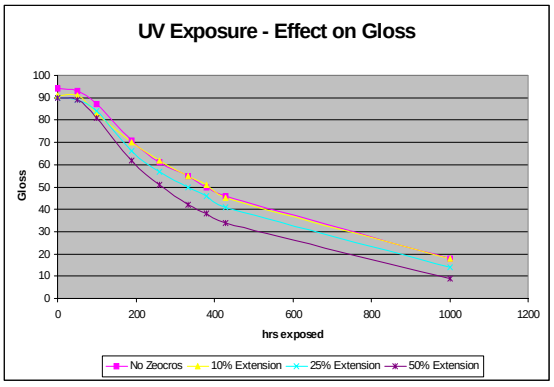
Technical Data for HYBRID Epoxy-Polyester System

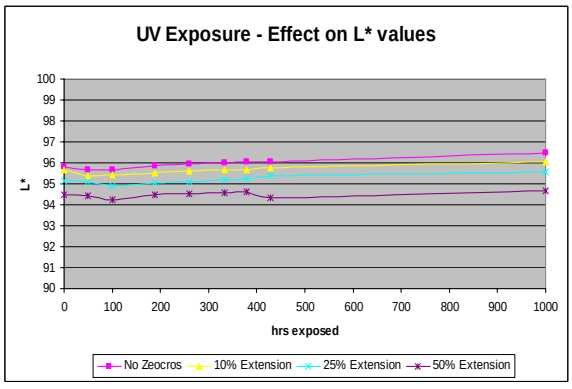
	100% TiO_2 (Standard)	10% (w/w) Extension	25% (w/w) Extension	50% (w/w) Extension
Formulation (% $^{w}/_{w}$)				
Vantico Resin 6064	32.5	32.5	32.5	32.5
Cray Valley Resin 6877	32.5	32.5	32.5	32.5
Flow aid PV88	0.8	0.8	0.8	0.8
Benzoin	0.4	0.4	0.4	0.4
Barytes AW10	3.8	3.8	3.8	3.8
Kronos 2310	30.0	27.0	22.5	15.0
Zeocros E110	0	3.0	7.5	15.0
Gloss				
Baked for 10 mins @ 350ºF	93	92	93	91

Color				
ΔL*	Std	-0.27	-0.88	-1.67
Δa*	Std	0.05	0.06	-0.01
Δb*	Std	-0.20	-0.60	-0.80
ΔE	Std	0.34	1.07	1.85
Contrast Ratio				
50μ	97%	97%	96%	93%
90μ	99%	99%	98%	98%
Impact: 40 inch/lb				
Category	1	1	1	1
Flow				
Category	2	2	2	3
Cupping Test				
Pass	7mm	7mm	7mm	7mm
Notes on Processing				
	12 minutes at 50% torque	12 minutes at 50% torque	12 minutes at 50% torque, ran through smoother	10.5 minutes at 50% torque

UV STABILITY DATA (Epoxy-Polyester System)

UV stability data is generated from exposure of panels sprayed to 1.5 mils DFT cured with a xenon daylight emission spectrum using Q-Sun equipment. Film deterioration (up to 25%) is not significantly different from a non-extended system. There were no deleterious effects on the optical performance observed with L* a* b*.





Zeocros E110 is available in 25kg bags. For questions and/or sample requests, please contact:

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