



Powder Coatings Durability

September 2021

Powder Coating study

Applications for Powder Coatings

Outside testing lab statement

Polyester/ TGIC coating formulation

Gloss retention in QUV(A)

Conclusions

FP-Opacity Pigments™

are a partial replacement for TiO_2

are significantly lower cost than TiO_2

provide significant annual raw material costs savings

give equal to slightly improved performance

Powder Coating Applications

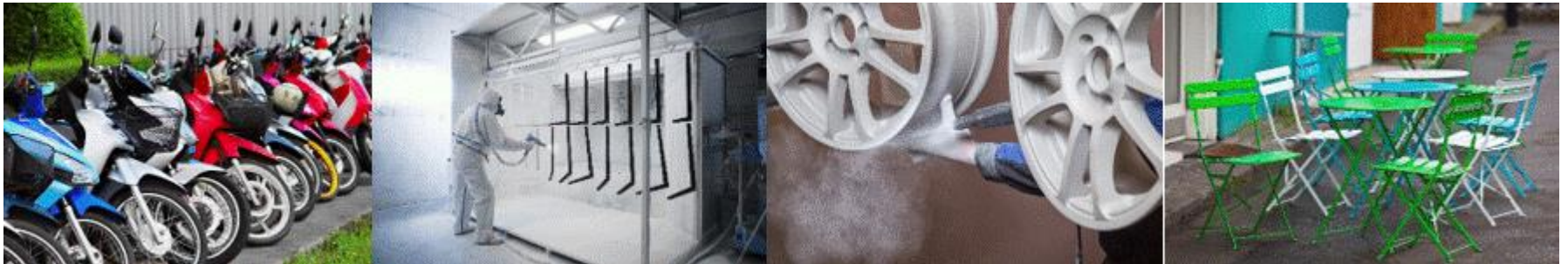
FP-480 and FP-460 Opacity Pigments™ are suitable for:

- Polyester: TGIC formulations
- Polyester/Primid formulations
- Epoxy/Polyester hybrid formulations
- Pure Epoxy formulations
- Urethane Polyester formulations
- Acrylic formulations



At an optimized TiO₂ replacement level of between 10% and 20%, FP-Opacity Pigments™ can be used for interior and general purpose exterior powder coatings.

FP-Pigments are suitable for use in UV cured Powder Coatings where their reduced UV absorption compared to TiO₂ can aid coating through-cure.



ChemQuest Powder Coating Research

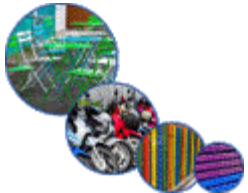
“ChemQuest Powder Coating Research has thoroughly tested FP-Opacity Pigments™ and has found them to provide excellent extension of titanium dioxide and also improved dispersion of tinting pigments. These enhancements come with no reduction in gloss, durability or mechanical properties of the film.”



ChemQuest
POWDER COATING RESEARCH



Kevin Biller, President
www.powdercoatingresearch.com



Materials

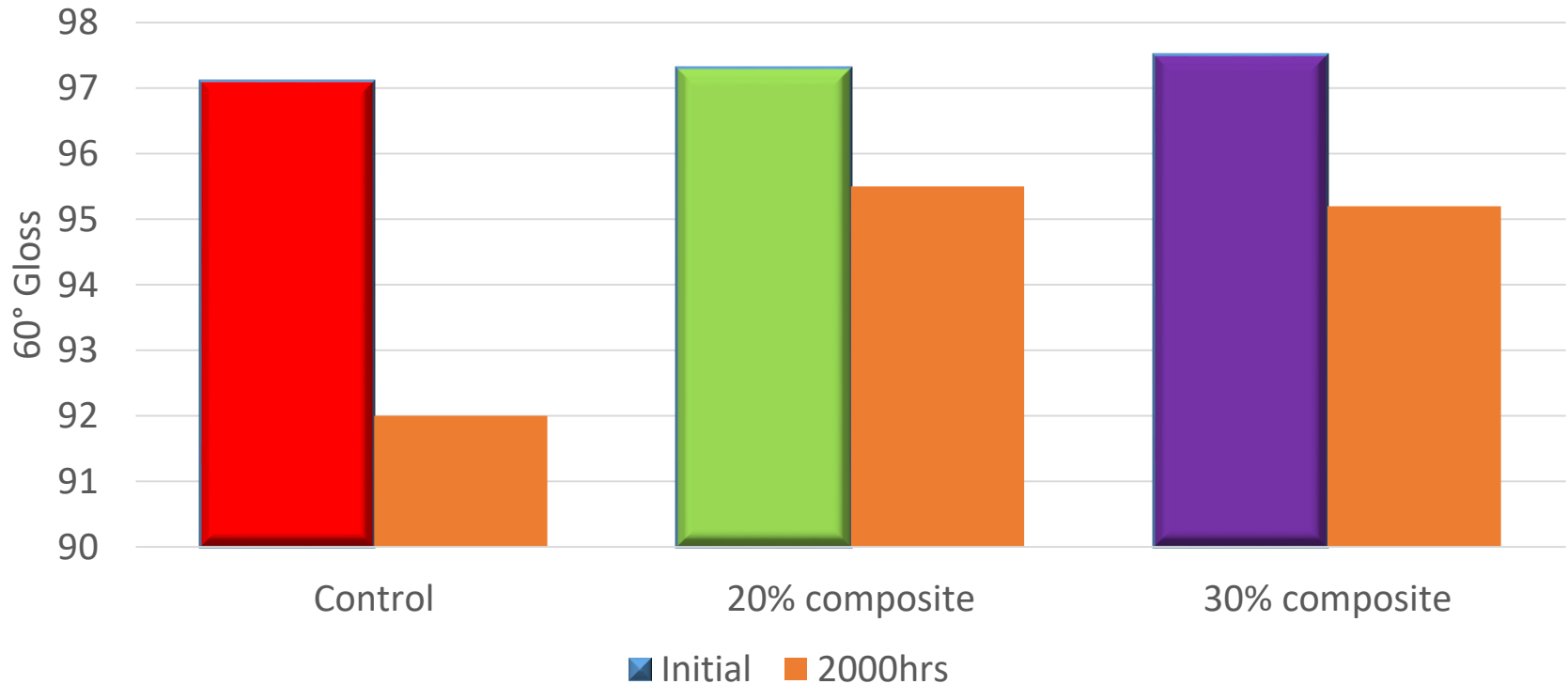
Polyester Resin –Cytec Crylcoat 2441-2
Crosslinker–Triglycidyl Isocyanurate
FlowAgent–ResiflowP67
Degassing Agent–Benzoin
25% TiO₂–Kronos2160
5% BaSO₄ - Sachtleben Blanc Fixe Micro
FP Pigments:
FP-480 Lot # 602/300/11

Processing Conditions

Premix:8 seconds Vitamix @ lowsetting
Extrusion: APV 19mm twin screw extruder
Zone1:130°C
Zone2:100°C
RPM:500
Torque:30-45%
Chill Rolls:20RPM
Grind: Strand Mill
Sieve:140 mesh(106µm)
Film Thickness: As specified
Bake: 10 minutes at 200°C

Typical Performance - Durability

Gloss Retention in Polyester/TGIC Powder Coating QUV(A)



QUV(A) accelerated durability shows the presence of FP-Opacity Pigment™ to have no significant effect on the exterior performance of powder coated panels. This mirrors the performance of FP-Pigments in commercial general purpose exterior coatings and Florida testing of exterior wood coatings.

Conclusion

FP-480 and FP-460 Opacity Pigments™ can safely be used in Powder Coating formulations up to 20% with no effect on exterior performance (2000 hours QUV(A)).

In this example, the loss of gloss is less than that of the control at up to 30% replacement.

