

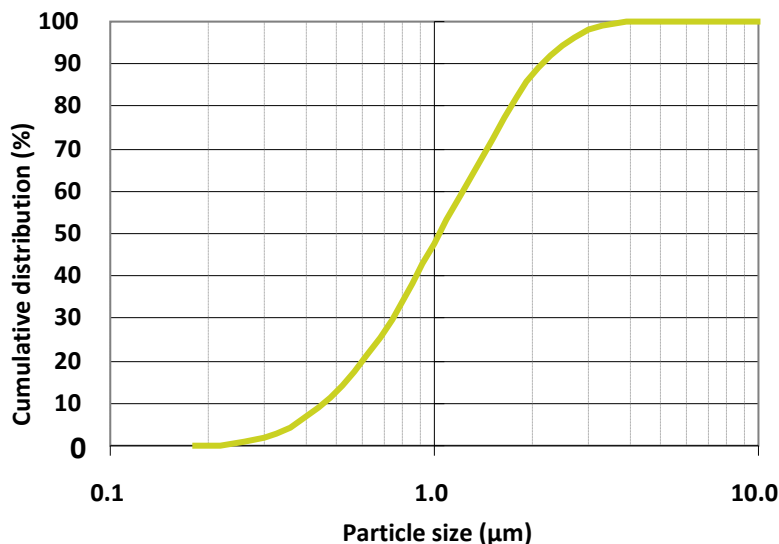
FP-460 OPACITY PIGMENT™

FP-460 is unique Opacity Pigment™ powder for use in water borne paint and printing ink applications. FP-460 is designed to give optimal optical properties enabling partial replacement of TiO₂ in coating and ink formulations.

FP-460 TYPICAL PIGMENT PROPERTIES

These are typical values but do not constitute specifications.

Dry Solids	%	99.0
Brightness (ISO)		95.0
L* value		98.8
b* value		1.4
Specific Surface Area (BET)	m ² /g	10.0
Average Particle Size	µm	1.0
Specific Gravity		2.8
Oil absorption	g/100g	43
Bulk / Tapped Density	g/l	415 / 675



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20% to 45% PVC Water-based Coatings

- 1) Replace 10% of the TiO₂ with the same weight of FP-460
- 2) Remove 10% of the largest particle size extender/filler in the formulation

This will result in a slight reduction in the PVC of the paint which helps to maintain the gloss level of the reformulated paint. At this stage the opacity of the formulation should be checked and if necessary a small level of opaque polymer (typically between 0.5% and 1.0% on total formulation weight) should be added. If opaque polymer cannot be used, then one or two percentage points of TiO₂ should be added back to the formulation.

If the replacement is successful following the 10% protocol, then further reductions can be attempted and we recommend doing this in 2.5% increments.

E.g.

- 1) Replace 12.5% of the TiO₂ with the same weight of FP-460
- 2) Remove 10% of the largest particle size extender/filler in the formulation
- 3) Adjust opacity using small additions of opaque polymer or replacing some TiO₂

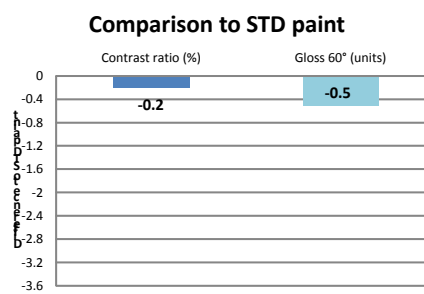
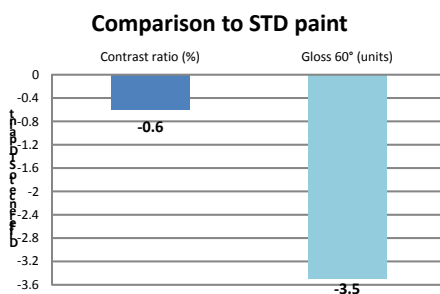


Gloss 15

Paint PVC ~ 30 %

Paint Volume Solids ~ 37 %

- **Weight to weight, 10 % TiO₂ replaced**
 - Differences in contrast ratio and gloss are clearly visible
- **Reformulated, 9 % TiO₂ replaced**
 - Successful reformulation: Contrast ratio and gloss within target range compared to STD paint

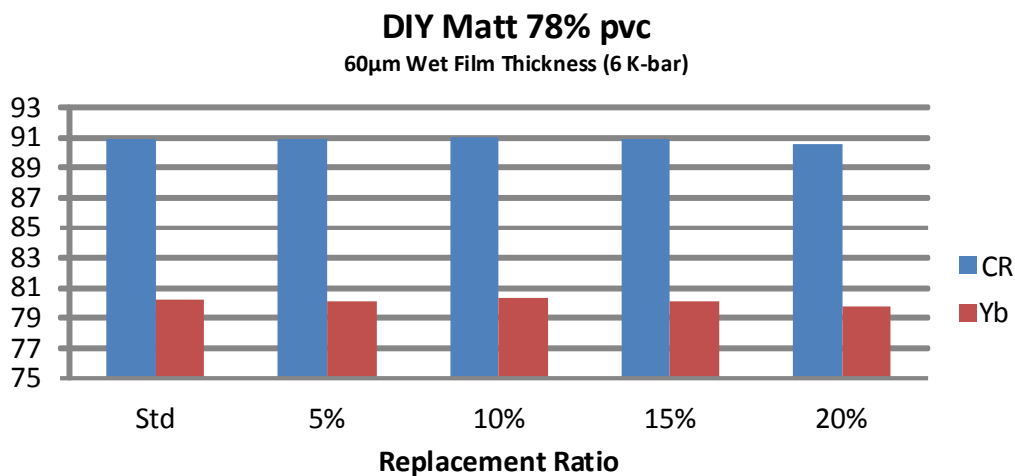


	STD	Changes	Reformulated for FP460
	wt %	wt %	wt %
TiO ₂	15	-1.35	13.65
FP460	0	1.35	1.35
< 1 micron GCC	12	-1.20	10.80
Opaque Polymer	0	0.60	0.60

50% to 90% PVC Water-based Coatings

- 1: Test using a replacement ladder of 5, 10, 15 and 20% FP-460.
- 2: Make a 1:1 weight for weight replacement of TiO₂ with Opacity Pigment.
- 3: For the optimum performance, the order of addition, where possible, should be:
 - i) Normal Millbase liquid ingredients and HEC thickener if present.
 - ii) Opacity Pigment™ followed immediately by
 - iii) TiO₂ Pigment
 - iv) then extenders
- 4: Mill as normal - no additional milling time is necessary.
- 5: Complete paint as normal.

Example Graph of Contrast Ratio vs Replacement Ratio



Optimum replacement level lies between
15% and 20%