

# Add Imerys Minerals to Reduce TiO<sub>2</sub>

Our extenders allow replacement of up to 25% titanium dioxide in paint without any loss of opacity or other key properties



## Take your TiO<sub>2</sub> to a new level

Never has titanium dioxide extension been more important in decorative paints, yet prices continue to increase and inventories remain low. Mineral extenders from Imerys can reduce a paint manufacturer's total titanium dioxide requirement, while at the same time enable savings in the raw material cost per gallon of paint.

- Reduce costs & alleviate pressure from escalating TiO<sub>2</sub> prices
- Reduce dependence on tight TiO<sub>2</sub> inventories
- Let Imerys technical experts help you reformulate

# Let Us Help You Reformulate

**Broad Portfolio** Imerys has a broad portfolio of mineral solutions designed to help reduce TiO<sub>2</sub> in customer formulations. We are the number one supplier of white industrial minerals in the world.

**New Product Development** Imerys designs products to help our customers with TiO<sub>2</sub> extension.

- New, innovative treated minerals are now available to help reduce dependence on TiO<sub>2</sub>.
- The new XCS™-Carb TiO<sub>2</sub> extender products are engineered to reduce crystalline silica content to non-reportable levels.

**Premium Product** NeoGen® 2000 is the premium product for TiO<sub>2</sub> extension in the paint and coatings industry. Compared to conventional calcined kaolin, NeoGen 2000 provides improved whiteness, better opacity and whiter tint strength, while improving TiO<sub>2</sub> extension and reducing costs.

**Contact Imerys** For help in reformulating your paint to reduce your use of TiO<sub>2</sub>, please contact David Skelhorn at (770) 843-5023 or DSKelhorn@imerys.com.

Contact our mineral experts in TiO<sub>2</sub> extension – let us teach your team how to reduce your dependence on TiO<sub>2</sub>.



## TYPICAL PROPERTIES | IMERYS MINERALS FOR TiO<sub>2</sub> EXTENSION (ORANGE INDICATES BEST SOLUTION)

	Mean Diameter (microns)	Oil Absorption (g/100g)	PVC Range	Recommended System
<b>Kaolin and Hydrous Kaolin Extenders: Traditional TiO<sub>2</sub> extenders for low PVC coatings</b>				
Kaopaque® 10S	0.5	45	All	Water
Hydrite® RS/RSA	0.45	43	All	Water
<b>Calcined Clay Extenders: PREMIUM TiO<sub>2</sub> extenders for decorative coatings</b>				
NeoGen® 2000	0.7	120	Above CPVC	Water
PoleStar® 400	0.7	100	Above CPVC	Water
Glomax® LL	1.4	75	Above CPVC	Water
Glomax® JDF	0.6	45	All	Water/Solvent/Powder
<b>Surface Treated Calcium Carbonate Extenders: PREMIUM TiO<sub>2</sub> extenders</b>				
ImerTiX™ 70 / XCS™-Carb 07ST	0.7	23	All	Water
ImerTiX™ 100 / XCS™-Carb 10ST	1.0	20	All	Solvent/Powder
ImerTiX™ 150 / XCS™-Carb 15ST	1.5	18	All	Water/Powder

Note: XCS-Carb product line has been engineered to contain less than reportable levels of crystalline silica.

**CRITICAL PIGMENT VOLUME CONCENTRATION (CPVC) | PRODUCT SELECTION FOR TiO<sub>2</sub> EXTENSION**

Imerys offers a range of products which are effective TiO<sub>2</sub> extension solutions. The extension mechanism is very different depending on position relative to CPVC. The choice is also dependent on the nature of the paint system, with products fitting differently in water based, solvent based and powder coating systems.

# BELOW CPVC

Imerys TiO <sub>2</sub> Extenders for Below CPVC	LATEX	SOLVENT	POWDER
ImerTiX 70	●		
XCS-Carb 07ST	●		
ImerTiX 100	●	●	●
XCS-Carb 10ST	●	●	●
Glomax JDF	●	●	●
Kaopaque 10S	●		
Hydrite RS/RSA	●		

**20% PVC SEMI-GLOSS ACRYLIC LATEX**

Formulation	Without ImerTiX	With ImerTiX
TiO <sub>2</sub> (lb)	203	151
ImerTiX (lb)	0	34.8
<b>Estimated Cost Savings</b>	-	<b>Up to 25%</b>

**TiO<sub>2</sub> EXTENSION BELOW CPVC ( $\lambda < 1.0$ )**

Below CPVC, TiO<sub>2</sub> extension by minerals occurs by spacing effects. Using Imerys minerals, you can replace up to 25% TiO<sub>2</sub> in a semi-gloss system while maintaining contrast ratio, whiteness and gloss. Tint strength is maintained at up to 15% replacement while offering significant cost savings.

# ABOVE CPVC

Imerys TiO <sub>2</sub> Extenders for Above CPVC	LATEX	SOLVENT	POWDER
NeoGen 2000	●		
PoleStar 400	●		
Glomax LL	●		
ImerTiX 150	●		●
XCS-Carb 07ST	●		
ImerTiX 100	●	●	●
XCS-Carb 10ST	●	●	●

**PVC VINYL ACRYLIC LATEX**

Formulation	Conventional Calcined Clay	NeoGen 2000
% PVC	57	52
% TiO <sub>2</sub> Reduction	0	27.1

**Pigment System**

Pigment System	Conventional Calcined Clay	NeoGen 2000
TiO <sub>2</sub> (R-706)	181	131.9
Conventional Calcined Clay	181	-
NeoGen 2000	-	145
DiaFil	17.5	20.5
#10 White	-	51.2

**Estimated Cost Savings** - **Up to 20%**

**TiO<sub>2</sub> EXTENSION ABOVE CPVC ( $\lambda > 1.0$ )**

Above CPVC, TiO<sub>2</sub> extension occurs by: a) "engineering" the size and frequency of light scattering sites; b) spacing effects.

# Reduce Your Dependence on TiO<sub>2</sub>

## MECHANISM OF TiO<sub>2</sub> EXTENSION

### TITANIUM DIOXIDE FOR WHITENESS

Titanium dioxide (TiO<sub>2</sub>) is the most effective pigment for whiteness. Whiteness is produced by scattering light in the visible spectrum using a refractive index (R.I.) which is substantially different than the media in which it is used and an optimal particle size (in the 0.2 to 0.4 micron range.) Because the supply of TiO<sub>2</sub> continues to be a problem, these same principles can also be applied to extenders, allowing them to complement or extend the TiO<sub>2</sub>. The use of extenders must be carefully fitted to the formulation design of the paint or coating, as not every extender will work effectively in every system. Imerys provides several solutions to extend your TiO<sub>2</sub>.

### KAOLIN CLAY EXTENDERS FOR LOW PVC COATINGS

Kaolin clay extenders function primarily as spacers and, in a mixed system, they help to maintain the separation of dispersed TiO<sub>2</sub>. Kaolin clays mechanically prevent TiO<sub>2</sub> from aggregating and causing loss of efficacy. Hydrous kaolin clays are also effective as TiO<sub>2</sub> extenders and can help with gloss control, rheology and hold-out. Imerys products: Kaopaque and Hydrite.

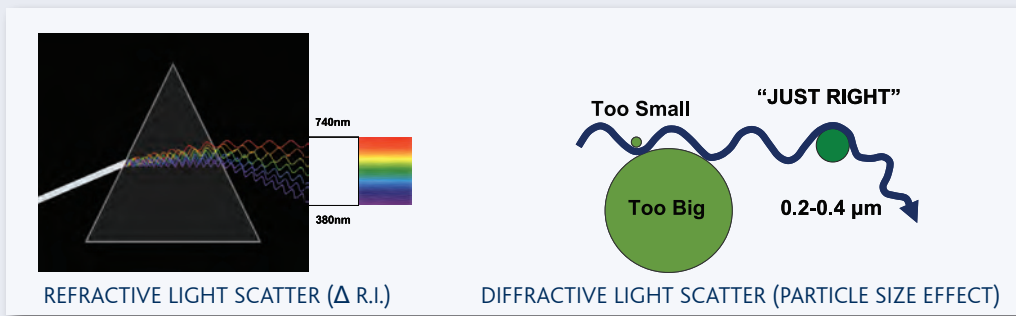
### CALCINED CLAY EXTENDERS FOR COATINGS

Engineered calcined clay extenders form complex structures that allow micro-void air to be introduced to the paint film. Air has

a very different refractive index to the binder vehicle making calcined clay extenders powerful light scatterers that produce a clean, white paint. This forms the basis of our NeoGen 2000 technology—it produces films of higher whiteness in comparison to traditional calcined clay products. Additional refinements in oil absorption control allow the effects to be obtained at lower PVC's. (Effective TiO<sub>2</sub> extension with calcined clay occurs at or above CPVC.) Imerys products: NeoGen, PoleStar and Glomax.

### SURFACE TREATED CALCIUM CARBONATE EXTENDERS

Surface treated calcium carbonates demonstrate a significant refinement over their conventional unmodified counterparts. The Imerys products are extraordinarily easy to disperse in paint systems. Surface treatment enables a finer degree of dispersion and provides measurably better functionality when used with TiO<sub>2</sub>. The Imerys products act as strong spacers, and this improved dispersion increases the scattering effect. The products have almost neutral white color and can provide substantial gloss control in a semi-gloss system. Additionally, Imerys products can be used with calcined clay systems to provide secondary whiteness while keeping oil absorption effects under control. These products contain very low (<0.1%) silica. Imerys products: XCS-Carb and ImerTiX.



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### Technical support for TiO<sub>2</sub> extension

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