
Cost-Effective Whites



Cost-effective whites are designed to meet the market needs for balancing quality and cost

Summary

Titanium dioxide (TiO₂) provides opacity by reflecting light which is possible due to its ability to scatter light. This is accomplished by refraction and diffraction of light as it passes through or near titanium dioxide particles. If there are enough particles present, all the light striking the surface will be reflected outward and the object will appear opaque and white.



Product Overview

In general, the greater the **Refractive Index (R.I.)** of the pigment, the greater the light scattering and the better the opacity. Virgin polyethylene exhibits a 1.5 refractive index. Listed here are the refractive indices of several common white opacifiers. As you can see, Rutile TiO₂ is by far the best opacifier. Compared to Anatase TiO₂, Rutile has a more tightly packed crystal structure resulting in a higher density and a more efficient opacifier

	Substance	Refractive Index
Media	Air	1.0
	Water	1.3
	Polymers, Polyolefin	1.5
Pigments	Lithopone	1.8
	Zinc Oxide	2.0
	Zinc Sulfide	2.4
	Titanium Dioxide, Anatase	2.5*
	Titanium Dioxide, Rutile	2.7*
Extenders	CaCO ₃	1.5
	CaSO ₄	1.6

There are many varieties of Rutile TiO₂ available in today's market. These are differentiated by such things as particle size and surface treatment. The particle size affects light scattering, and therefore the shade (blue or yellow) observed. The human eye perceives the bluer shades of TiO₂ as being brighter or cleaner. The other significant variable is the surface modification or treatment—virtually all TiO₂ has some degree of surface treatment. Organic or inorganic additives are applied to the surface, and treatment levels of 0.50% to 1.0% are common. The surface treatment can be customized to aid such things as reducing die build-up, improve dispersability, and better weatherability. In the case of weathering grades of TiO₂, where chalking and crazing are a concern, treatment levels of up to 10% are common.

With recent market condition dynamics, Ampacet has put together a portfolio of cost-effective white masterbatches. We begin by utilizing a wider selection of carrier resins, grades of TiO₂, and including fillers as well as extenders. Understanding customer product performance requirements, such as extrusion process, FDA requirements, opacity and dispersion needs, will help determine proper white masterbatch solutions.

Products/Codes

Production Code	Resin	Application	Comments	FDA
111707	LLDPE	Blown Film	68-70% strength white	Application dependent
1100566-G	LLDPE	Blown Film & All Molding	70% strength white	Application dependent
11777	LLDPE/LDPE	Blown Film (variable raw materials)	ECONOBLEND™ High Strength	Application dependent
110017	LLDPE	Blown Film (110017-A for Blow Molding)	50% strength white	Application dependent
111717-A	LLDPE	Blown Film	<40% strength white	Application dependent
111717-B	LLDPE	Blown Film	<30% strength white	Application dependent



For more information on Ampacet **Cost-Effective White** masterbatches, their uses and complete Regulatory Status, contact your Ampacet Account Executive or visit www.ampacet.com.

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