

# DuPont™ Ti-Pure® R-104

## TITANIUM DIOXIDE

### Product Description

DuPont™ Ti-Pure® R-104 is a rutile titanium dioxide pigment manufactured by the chloride process. It is specifically designed to give outstanding melt flow with highly loaded thermoplastics masterbatches. Ti-Pure® R-104 combines high tinting strength and blue undertone. Ti-Pure® R-104 offers excellent lacing resistance in high-temperature extrusion coating and cast film applications. Ti-Pure® R-104 is supplied as a fine, dry, white powder with the following general properties.

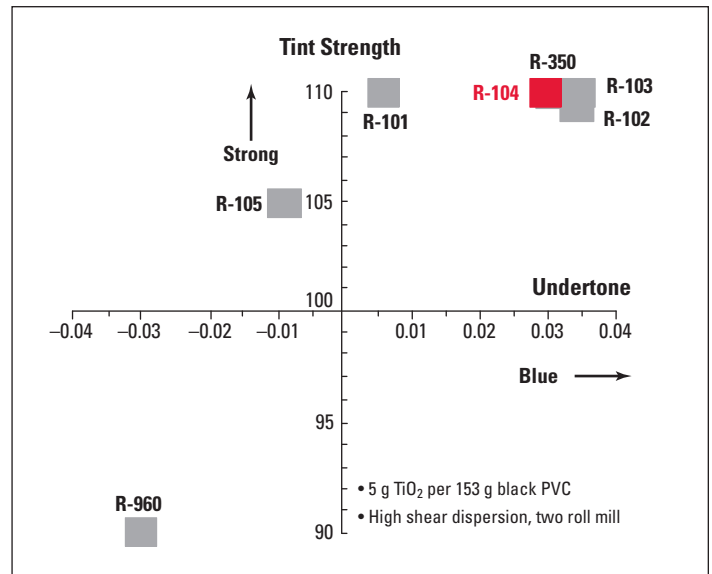
**Table 1**  
**Physical Properties**

Titanium Dioxide, wt%, min.	97
Alumina, wt%, max.	1.7
Organic Treatment, wt%, carbon	0.3
Specific Gravity	4.2

### Suggestions for Use

Ti-Pure® R-104 is designed primarily for plastic applications. The properties of Ti-Pure® R-104 are especially valuable where high concentrations of pigment are desired in thermoplastic masterbatches and where minimal effect is desired on melt flow. This, combined with the following, makes Ti-Pure® R-104 a valuable asset to the color formulator.

**Figure 1. Optical Properties**



**Table 2**  
**General Properties**

Opacity Strength	High
Undertone Tint	Very Blue
Dispersibility in:	
Thermoplastics	Excellent
Dry Blending Operations	Excellent
Effect on Melt Flow	Minimal
Lacing Resistance	Excellent
Weathering Resistance	"Chalking" grade in PVC use

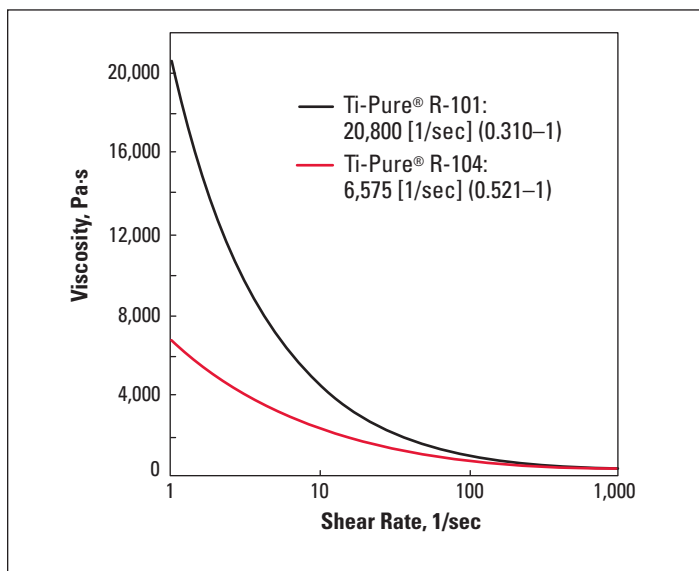
Ti-Pure® R-104 has a unique surface treatment that causes it to have minimal effect on the melt flow properties of masterbatches. This allows the masterbatch producer to achieve high loadings in relatively low melt index resins and still have a melt processible material. The effects of Ti-Pure® R-104 and R-101 on melt index are shown in **Table 3**.

**Table 3**  
**Melt Index**

Pigment	wt%	Melt Index Effects in Three Resins		
		12	22	70
R-101	50	7.4	—	—
R-104	50	9.3	—	—
R-101	60	4.0	—	—
R-104	60	8.1	—	—
R-101	70	nil	nil	—
R-104	70	5.4	10.2	—
R-101	80	—	—	nil
R-104	80	—	—	10.6

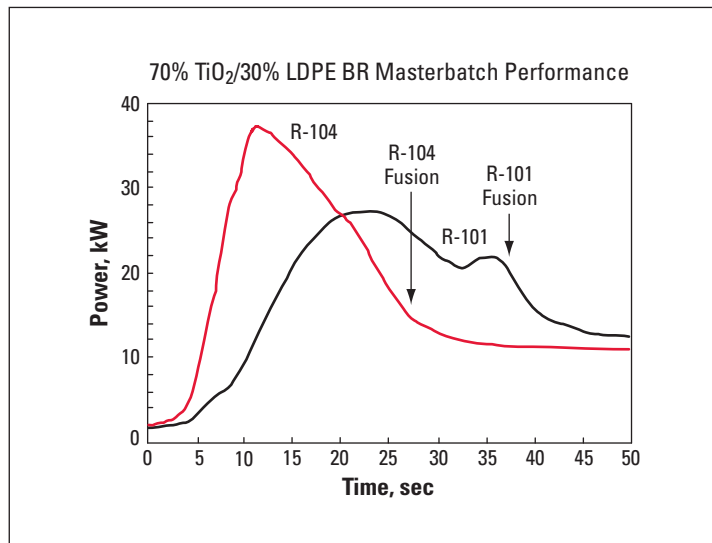
While melt index is a good measure of relative performance, the method does not reveal much about actual process conditions. Capillary melt flow measurements fill this gap, allowing viscosity to be measured over the normal range of processing equipment. **Figure 2** shows the profound reduction in viscosity that can be achieved with Ti-Pure® R-104 in a 70% low density polyethylene masterbatch.

**Figure 2. Melt Rheology of 70% TiO<sub>2</sub> Masterbatch (12 MFI LDPE at 190°C)**



Ti-Pure® R-104 easily “wets” with the surface of the thermoplastics and can dramatically increase process rates during preparation of thermoplastic masterbatches in certain types of compounding equipment. A typical internal mixer power curve is shown in **Figure 3**, which compares Ti-Pure® R-104 and R-101 grades of titanium dioxide. It is apparent that cycle time reductions of up to 25% can be readily achieved.

**Figure 3. Internal Mixer Power Curve (R-104 versus R-101 Standard)**



## Shipping Containers

Ti-Pure® R-104 rutile titanium dioxide is available in two recyclable package types to meet your needs:

- 25 kg polyethylene bags
- 1 metric ton (1,000 kg) flexible intermediate bulk containers

For further information about this grade or to request a sample, please see the DuPont Titanium Technologies web site.

[www.titanium.dupont.com](http://www.titanium.dupont.com)

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