

# DuPont™ Ti-Pure® R-105

## TITANIUM DIOXIDE

### Product Description

DuPont™ Ti-Pure® R-105 is a rutile titanium dioxide pigment manufactured by the chloride process that produces a bright TiO<sub>2</sub>. Rutile titanium dioxide is the most widely used white pigment. R-105 is specially designed for outdoor plastic applications, combining neutral undertone with moderate opacity strength for easy color formulation work. Silica encapsulation technology minimizes the interaction of the TiO<sub>2</sub> surface with other materials within the plastic matrix. R-105 also is treated with an organic-based material to provide excellent bulk flow and processing while minimizing the hygroscopic nature of inorganically coated TiO<sub>2</sub>. R-105 is a fine, dry powder with the following general properties.

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

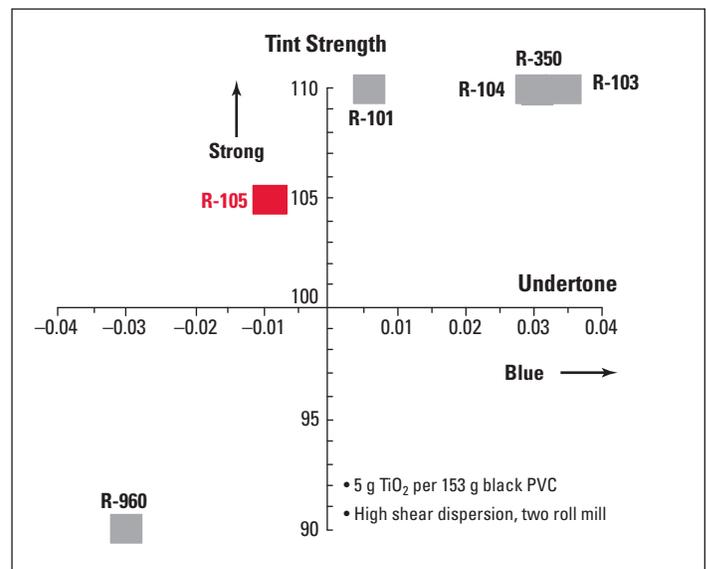
|                             |     |
|-----------------------------|-----|
| Titanium Dioxide, wt%, min. | 92  |
| Alumina, wt%, max.          | 3.2 |
| Silica, wt%, max.           | 3.5 |
| Carbon, wt%                 | 0.2 |
| Specific Gravity            | 4.0 |

### Suggestions for Use

Ti-Pure® R-105 is recommended for outdoor plastics, especially PVC window profile applications. R-105 utilizes silica encapsulation technology to minimize interaction of the TiO<sub>2</sub> surface with the surrounding environment. This minimizes “chalking,” crazing, and other surface deterioration frequently seen in outdoor applications. R-105 surface treatment also is optimized for dry flow conveyability and dispersion within plastics.

Ti-Pure® R-105 optical performance is exceptionally useful for exterior PVC products. R-105 has an excellent combination of brightness, neutral undertone and moderate tinting strength (**Figure 1**).

**Figure 1. Optical Properties**



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

|                             |           |
|-----------------------------|-----------|
| Opacity Strength            | Medium    |
| Undertone Tint              | Neutral   |
| Weathering Resistance       | Excellent |
| Dispersibility in:          |           |
| Plasticized Vinyl           | Very Good |
| Dry Blending Operations     | Excellent |
| Melt Compounding Operations | Very Good |

## Durability

DuPont™ Ti-Pure® R-105 technology has optimized SiO<sub>2</sub> encapsulation for durability. By providing a uniform, complete coating of the TiO<sub>2</sub> surface, the SiO<sub>2</sub> layer acts as a barrier to prevent the surface of the TiO<sub>2</sub> from reacting with the polymer or additives. This is especially important in outdoor applications where the UV energy absorbed by the TiO<sub>2</sub> particle may induce photocatalytic reactions. R-105 provides excellent gloss retention in outdoor PVC applications (**Table 3**).

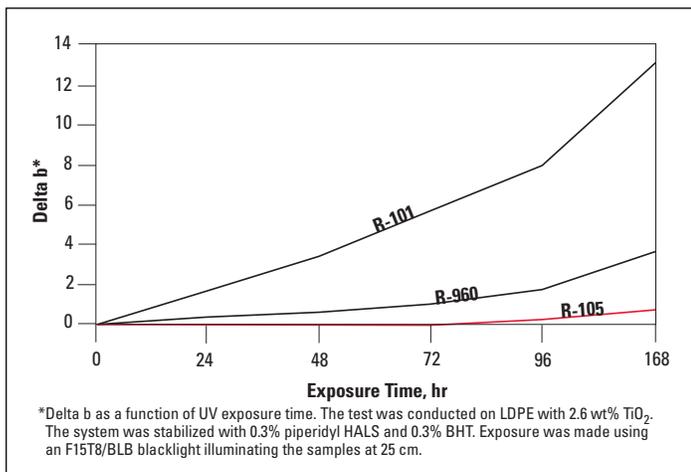
**Table 3**  
**Gloss Retention—Lead Stabilized PVC Profile**

|                          | % Initial Gloss             |                               |
|--------------------------|-----------------------------|-------------------------------|
|                          | 18 months<br>(Florida, USA) | 18 months<br>(Bandol, France) |
| R-103 ("chalking" grade) | 14                          | 15                            |
| R-105                    | 100                         | 64                            |

## Discoloration Resistance

The combination of surface treatments used in Ti-Pure® R-105 provides excellent resistance to photo-induced discoloration. R-105 minimized lead graying in PVC systems and phenolic yellowing in polyethylene systems (**Figure 2**).

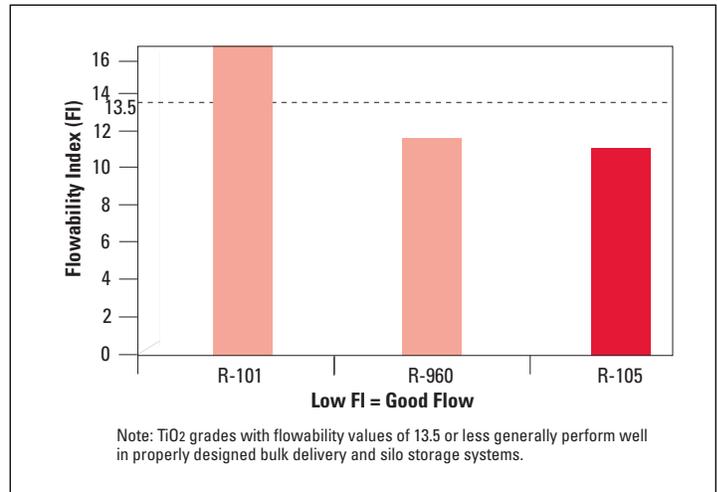
**Figure 2. Discoloration Resistance**



## Conveyability

Ti-Pure® R-105 surface treatment allows for use in bulk delivery and conveying systems. The combination of inorganic and organic surface treatment optimizes R-105's flowability (**Figure 3**).

**Figure 3. Bulk Flow Performance**



## Shipping Containers

Ti-Pure® R-105 rutile titanium dioxide is available in two recyclable package types to meet your needs:

- 25 kg polyethylene bags (Paper bag available in Asia Pacific only)
- 1 metric ton (1,000 kg) flexible intermediate bulk containers

Ti-Pure® R-105 can also be delivered by bulk truck to European customers using silo systems. Please contact your local DuPont account manager for details.

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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