

# Grade Snapshot

# **Product Information**

# **Product Description**

Ti-Pure<sup>™</sup> R-104 is a rutile titanium dioxide pigment, manufactured by the chloride process that produces a high TiO<sub>2</sub> content product delivered as a fine, dry powder. Ti-Pure<sup>™</sup> R-104 offers excellent lacing resistance in hightemperature extrusion coating and cast film applications. It is excellent for high-temperature plastics applications requiring outstanding dispersibility and lowest possible volatility.

Ti-Pure<sup>™</sup> R-104 is a hydrophobic grade designed with a particle size tailored to achieve a blue undertone and an organic-based coating to support good bulk flow and ease of dispersion.

Available in 25 kg bag or 1 metric ton (1000 kg) semi-bulk packaging.

# **Key Benefits**

- Outstanding dispersion performance, low surface volatility, and superior compatibility with polymers to maximize masterbatch loading
- Outstanding dispersion performance and processability that maximizes processing efficiency
- Excellent lacing resistance enabling film downgauging and allowing fewer surface defects
- Superior opacification for reliable color formulations and attractive graphics and print pop
- Blue undertone for clean, brighter whites
- Suitable for food contact applications

# **Suggestions For Use**

Ti-Pure<sup>™</sup> R-104 is frequently found in high-quality rigid and flexible packaging for demanding food applications that require uncompromising quality; Reflective films for electronic and photovoltaic applications; and Thermoplastic masterbatches that need high pigment concentrations.



# High Quality and Consistent Thermoplastic Masterbatches

Ti-Pure<sup>™</sup> R-104 delivers differentiated optical performance with the highest combined brightness, tinting strength, and blue undertone. In the masterbatch compounding process, its excellent dispersion quality translates to superb processability. Ti-Pure<sup>™</sup> R-104 "wets" easily into resins and is readily incorporated. This results in up to 25% faster throughput than other general purpose grades of titanium dioxide and greater flexibility at a variety of pigment loadings.

#### Cast and Blown Films

Thermoplastic masterbatches with Ti-Pure<sup>™</sup> R-104 makes downgauged films with low defect rates possible due to low moisture pick-up. It also delivers excellent "print pop" in a broad range of applications such as flexible and rigid packaging, permeable hygiene and medical specialty films, indoor furniture films, and back sheet films for photovoltaics. Ti-Pure<sup>™</sup> R-104 can also be optimized to provide light protection in packaging applications where prevention of degradation of light sensitive ingredients and shelf life are critical.

# Biodegradable (Compostable)

Ti-Pure<sup>™</sup> R-104 is certified as harmless in the composting process according to DIN 13432. This make it possible for use in masterbatches produced for compostable plastics applications. Certification can be found on <u>https://www.dincertco.de/</u>



#### **Table 1. Physical Properties**

Property	Ti-Pure <sup>™</sup> R-104
Titanium Dioxide, wt%, min.	97
Alumina, wt%, max.	1.7
Organic Treatment, wt%, carbon	0.3
Specific Gravity	4.2

#### Figure 1. Optical Properties



Ti-Pure™ R-104 has a tightly controlled particle size resulting in a blue undertone and high tint strength providing clean color and consistent opacity.

#### Figure 2. Dispersion Performance (50% TiO<sub>2</sub> Loading)





Typical General Purpose Grade

The particle size and treatment of Ti-Pure™ R-104 result in excellent dispersion in both masterbatch compounding and final application. Illustration of Screen Pack Dispersion (SPD) testing conducted to demonstrate dispersion performance.

### Figure 3. Melt Rheology of 70% TiO<sub>2</sub> Masterbatch 12 MFI LDPE at 190 °C



The unique surface treatment of Ti-Pure™ R-104 results in minimal effect on melt properties to provide higher process rates of masterbatches.

#### For more information, visit tipure.com

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#### Figure 4. Masterbatch Moisture Pick-up 30° C/85% RH



Typical competitive nondurable grades for Polyolefin applications

High-temperature processing can vaporize even the smallest water content to create film lacing. Ti-Pure™ R-104 is low initial moisture and lowest rate of moisture pick-up in pigment and masterbatch samples.

#### Figure 5. Extreme Lacing Resistance 15% TiO<sub>2</sub>, 50 µm





Ti-Pure<sup>™</sup> R-104

Competitor A





Competitor B

Ti-Pure™ R-104 is the best offering to serve the film application which is going thinner and thinner.

#### **Figure 6. Reflective Summary**



Ti-Pure<sup>™</sup> R-104 possesses unsurpassed optical reflectivity. High dispersion and optimum particle size design result in a greater amount of light reflection.