

Summary of IS 411:2020 – Titanium Dioxide, Anatase for Paints (with Amendment 1:2022)

Titanium Dioxide (TiO₂) is a widely used white pigment in the paint, plastic, paper, cosmetics, and pharmaceutical industries due to its high opacity, brightness, and refractive index. It exists in two crystalline forms:

1. **Anatase** – Softer, lower density, higher photocatalytic activity.
2. **Rutile** – Denser, more durable, better UV resistance.

Both the forms of Titanium dioxide are used substantially in paint industry. Though both types of pigment are chemically similar, they differ in crystalline structure and hence in physical properties. The type is identified more accurately by X-ray diffraction than the relative density.

IS 411:2020 ‘Titanium Dioxide, Anatase for Paints’ prescribes the requirements and methods of sampling and test for titanium dioxide, anatase, used as a pigment in the paint industry. Rutile type of Titanium dioxide has been excluded from the scope of this standard which has been separately been covered in IS 9788:2023 ‘Titanium dioxide rutile for paints- Specification’. IS 411 was first issued in 1953 and subsequently revised in 1968, 1981 and 2020 to align with technological advancements.

This revision (fourth revision) aligns with ISO 591:2000 and includes additional testing requirements such as volatile matter at 105°C after 24 hours of preconditioning, resistivity of aqueous extract, and scattering power. This standard mandates the confirmation of the anatase crystal structure using X-ray diffraction which ensures greater accuracy in identifying the product.