



Standard Test Methods for Percent Solids in Titanium Dioxide Slurries¹

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1. Scope

1.1 These test methods cover the determination of the weight percent of solids in aqueous slurries of titanium dioxide pigments by either the use of a gravity-convection oven (Method A), infrared radiation moisture analyzer (Method B), or a microwave drying system (Method C).

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This test standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D 1193 Specification for Reagent Water

3. Summary of Test Method

3.1 *Oven Method:*

3.1.1 Slurry is weighed by difference into a tared aluminum foil dish, dried at 105°C in an oven for 1 h, cooled in a desiccator, and weighed.

3.2 *Infrared Method:*

3.2.1 Slurry is dried under infrared lamps for a specified time and temperature. The results are obtained directly from the unit's display panel.

3.3 *Microwave Method:*

3.3.1 2 to 4 g of slurry is placed between two glass fiber pads and dried in a microwave drying system. The results are obtained directly from the unit's display panel.

4. Significance and Use

4.1 These test methods are intended as a quick and reliable procedure for measuring the titanium dioxide pigment content

of aqueous slurries. Included with the pigment content in the percent solids are the various nonvolatile additives used in preparing a stable slurry. Because the aluminum and silica oxide treatments on the more highly treated titanium dioxide pigments may change somewhat with prolonged drying, in the oven method the solids of the slurry are considered dry after heating at 105°C for 60 to 65 min. The high temperature associated with the infrared moisture analyzer may also effect a change in the aluminum and silica oxide treatment on highly treated TiO₂ products. Therefore, care in selection of time and temperature are critical to obtain accurate results with the infrared method. With the short duration of test associated with the microwave drying system, overdrying is not a concern.

5. Apparatus

5.1 *Oven Method:*

5.1.1 *Oven*—Laboratory oven capable of maintaining a temperature of 105 ± 2°C (**Note 1**). The oven may be a gravity-convection type or an oven with a low velocity, forced draft. An oven with a high-velocity, forced-draft air change, commonly used for baking finishes, is not suitable.

NOTE 1—The temperature in the oven must be constantly monitored. Many older ovens will no longer maintain ± 2°C; some will maintain this tolerance for a while but occasionally the thermostat will “stick” and the temperature will vary considerably.

5.1.2 *Balance*—Laboratory analytical balance, accurate to 0.1 mg, with 1-g optical readout range for fast weighing.

NOTE 2—Periodically check the accuracy of the 1-g optical scale of the balance by use of a known 1-g weight; adjust the balance if needed. The zero adjustment of the optical scale needs to be checked at least every hour routinely and immediately if there is any possibility of a spill having occurred on the balance.

5.1.3 *Desiccator*—Standard laboratory desiccator utilizing an indicating drying medium.

5.2 *Infrared Method:*

5.2.1 *Infrared Moisture Analyzer*—Automated moisture analyzer combining infrared drying technology and a precision analytical balance in a single unit.

5.3 *Microwave Method:*

5.3.1 *Microwave Drying System*—A National Recognized Testing Laboratory (NRTL) approved 630 W microwave drying system with 50 g, 0.1 mg readability internal balance to measure moisture/solids from 0.1 to 99.99 %.

¹ These test methods are under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.31 on Pigment Specifications.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.