



Standard Test Methods for Analysis of White Zinc Pigments¹

This standard is issued under the fixed designation D3280; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 These test methods cover procedures for the analysis of white zinc pigments.

1.2 The analytical procedures appear in the following order:

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Preparation of Sample	6
Zinc Oxide	
Total Zinc, Using Diphenylamine as Internal Indicator	7
Total Zinc, Using Uranyl Acetate as External Indicator	8
Total Impurities	9
Total Sulfur	10
Moisture and Other Volatile Matter	11
Leaded Zinc Oxide	
Total Lead	12
Total Zinc	13
Total Sulfur	14
Total Impurities	15
Moisture and Other Volatile Matter	16
Water-Soluble Salts	17
Zinc Sulfide	
Zinc Oxide	18
Zinc Sulfide	19
Water-Soluble Salts	20
Moisture and Other Volatile Matter	21
Barium Sulfate	22
Titanium Dioxide	23

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *This 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

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.

D280 Test Methods for Hygroscopic Moisture (and Other Matter Volatile Under the Test Conditions) in Pigments
D1193 Specification for Reagent Water
D1394 Test Methods for Chemical Analysis of White Titanium Pigments
E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

3. Summary of Test Method

3.1 Zinc Oxide:

3.1.1 *Total Zinc*—Determined using diphenylamine as an internal indicator and also using uranyl acetate as an external indicator. Total impurities are calculated.

3.1.2 *Total Sulfur*—Determined as BaSO₄ and calculated to sulfur.

3.1.3 *Moisture and Volatile Matter*—Determined in accordance with Method A of Test Methods D280.

3.2 Leaded Zinc Oxide:

3.2.1 *Total Lead*—Determined as PbSO₄ and calculated to percent PbO.

3.2.2 *Total Zinc*—Determined on the filtrate from procedure in 13.2.1 in accordance with methods in Sections 7 or 8.

3.2.3 *Total Sulfur*—Determined as BaSO₄ and calculated to percent SO₃.

3.2.4 *Total Impurities*—Calculated from compositional data.

3.2.5 *Moisture and Other Volatile Matter*—Determined in accordance with Method A of Test Methods D280.

3.2.6 *Water Soluble Salts*—Determined gravimetrically.

3.3 Zinc Sulfide:

3.3.1 *Total Zinc*—Determined using uranyl acetate external indicator in accordance with Section 9.

3.3.2 *Zinc Sulfide*—Determined in accordance with Sections 8 or 9 and calculating ZnO to ZnS.

3.3.3 *Water Soluble Salts*—Determined in accordance with Section 18.

3.3.4 *Moisture*—Determined in accordance with Method A of Test Methods D280.

3.3.5 *Barium Sulfate*—The sample is treated with N₂SO₄ and Na₂CO₃ and the residue of BaCO₃ is dissolved in HCl and (NH₄)₂SO₄ added to precipitate BaSO₄, which is weighed.

3.3.6 *Titanium Dioxide*—Determined in accordance with Test Methods D1394.