



Designation: D50 – 90 (Reapproved 2019)

Standard Test Methods for Chemical Analysis of Yellow, Orange, Red, and Brown Pigments Containing Iron and Manganese¹

This standard is issued under the fixed designation D50; 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 chemical analysis of yellow, orange, red, and brown pigments containing iron and manganese. The test methods apply specifically to the following pigments: synthetic hydrated yellow iron oxide, yellow ochre, red and brown iron oxides, raw and burnt umber, raw and burnt sienna, and venetian red.

1.2 The analytical procedures appear in the following order:

Dry Pigments	Sections	ASTM Method References
Moisture and Other Volatile Matter	6	D280
Loss on Ignition	7	
Coarse Particles	8	D185
Matter Soluble in Water	9	D1208
Organic Coloring Matter	10	
Iron Oxide	11 and 12	
Calcium Compounds (Reported as CaO)	13 and 14	
Sulfates Soluble in Hydrochloric Acid	15 and 16	
Lead Chromate (in Ochres)	17	
Calcium Carbonate (in Venetian Red)	18	C25
Manganese (in Siennas and Umbers)	19 and 20	
Pigment Pastes in Oil		
Pigment Content	21	D1208
Moisture and Other Volatile Matter	22	D1208
Nonvolatile Matter in Vehicle	23	
Moisture by Distillation	24	D1208
Coarse Particles and Skins	25	D185
Consistency (Stormer)	26	D562

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

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- C25 Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime
- D185 Test Methods for Coarse Particles in Pigments
- D280 Test Methods for Hygroscopic Moisture (and Other Matter Volatile Under the Test Conditions) in Pigments
- D562 Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer
- D1193 Specification for Reagent Water
- D1208 Test Methods for Common Properties of Certain Pigments
- E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

3. Significance and Use

3.1 These test methods compile in one place, recommended procedures for analyzing inorganic colored pigments. These pigments are used extensively in paints, and for this reason their compositions are important to the formulators and user.

4. Preparation of Sample

4.1 Mix the sample thoroughly and take a representative portion for analysis. Reduce any lumps or coarse particles to a fine powder by grinding. Grind extracted pigments to pass a No. 80 (180-μm) sieve (see Specification E11 for detailed

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.