



Designation: D769 – 01 (Reapproved 2019)

## Standard Specification for Black Synthetic Iron Oxide<sup>1</sup>

This standard is issued under the fixed designation D769; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This specification covers the pigment commercially known as black synthetic iron oxide.

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

1.3 *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:*<sup>2</sup>

**D50** Test Methods for Chemical Analysis of Yellow, Orange, Red, and Brown Pigments Containing Iron and Manganese

**D185** Test Methods for Coarse Particles in Pigments

**D280** Test Methods for Hygroscopic Moisture (and Other Matter Volatile Under the Test Conditions) in Pigments

**D387** Test Method for Color and Strength of Chromatic Pigments with a Mechanical Muller

**D1208** Test Methods for Common Properties of Certain Pigments

**D3872** Test Method for Ferrous Iron in Iron Oxides

### 3. Composition and Properties

3.1 The pigment shall be a manufactured ferrous-ferric oxide obtained by chemical reaction. It shall be a soft dry finely powdered pigment, free of admixtures of other substances and shall conform to the following requirements:

Total ferrous and ferric oxide, min %	93
Ferrous oxide (FeO), min, %	20
Water-soluble matter, max, %	0.5
Moisture and other volatile matter, max, %	1.0
Coarse particles (total residue retained on a No. 325 (45- $\mu$ m) sieve), max, %	0.5
Hydrogen ion concentration (pH value)	4.5 to 8.5

3.2 The mass color and character of the tint and the tinting strength formed by a mixture with a white pigment shall be within mutually agreed upon limits of a standard acceptable to both the purchaser and the seller.

### 4. Sampling

4.1 Two samples shall be taken at random from different packages from each lot, batch, day's pack, or other unit of production in a shipment. When no markings distinguishing between units of production appear, samples shall be taken from different packages in the ratio of two samples for each 4540 kg or 10 000 lb, except that for shipments of less than 10 000 lb, two samples shall be taken. At the option of the purchaser, the samples may be tested separately or after blending in equal quantities the samples from the same production unit to form a composite sample.

### 5. Test Methods

5.1 Tests shall be conducted in accordance with the appropriate test methods. Test procedures not covered by ASTM test methods shall be mutually agreed upon between the purchaser and the seller.

5.1.1 *Total Iron Oxides*—Test Methods **D50**.

5.1.2 *Ferrous Iron in Iron Oxides*—Test Method **D3872**.

5.1.3 *Water Soluble Matter, Maximum, Percent*—Test Methods **D1208**.

5.1.4 *Moisture and Other Volatile Matter, Maximum, Percent*—Test Methods **D280**.

5.1.5 *Coarse Particles (Total Residue Retained on a 325-mesh sieve (45  $\mu$ m), Maximum, Percent*—Test Methods **D185**.

5.1.6 *Hydrogen Ion Concentration (pH value)*—Test Methods **D1208**.

5.1.7 *Mass Color and Tinting Strength*—Test Method **D387**.

### 6. Keywords

6.1 black iron oxide; ferric oxide; ferrous oxide; iron oxide; manganese; pigment; synthetic iron oxide

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee **D01** on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee **D01.31** on Pigment Specifications.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.



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