



Standard Specification for Yellow Iron Oxide Hydrated¹

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

1. Scope

1.1 This specification covers the pigment commercially known as yellow iron oxide, hydrated.

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

2. Referenced Documents

2.1 ASTM Standards:

D 50 Test Methods for Chemical Analysis of Yellow, Orange, Red, and Brown Pigments Containing Iron and Manganese²

D 185 Test Methods for Coarse Particles in Pigments, Pastes, and Paints²

D 280 Test Methods for Hygroscopic Moisture (and Other Matter Volatile Under the Test Conditions) in Pigments²

D 1208 Test Methods for Common Properties of Certain Pigments²

3. Composition and Properties

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

Total hydrated oxide of iron, min, %	93
Total oxide of iron, ^A min, %	83
Loss on ignition, ^A max, %	13
Moisture and other volatile matter, max, %	1.0
Water soluble matter, max, %	0.50
Coarse particles (total residue retained on a No. 325 (45- μ m) sieve), max, %	0.5
Hydrogen ion concentration (pH value)	4.5 to 8.0

^A Total hydrated oxide of iron shall be the sum of iron oxide and loss on ignition. Loss on ignition shall be calculated on the dry material.

3.2 *Paste in Oil*—The paste in oil shall be made by thoroughly grinding the specified pigment with linseed oil (with or without a small amount of volatile thinner) together with (where necessary) small amounts of wetting or dispersing agents to a semipaste or fluid type consistency. As received, it

shall not be caked in the container and shall break up readily in oil to form a smooth paint of brushing consistency. It shall mix readily in all proportions, without curdling, with linseed oil, turpentine, or volatile petroleum spirits, or any mixtures of these substances. The paste shall conform to the following requirements:

Pigment, min, %	55
Nonvolatile vehicle, min, % of vehicle	80
Moisture by distillation, max, %	2.0
Coarse particles and skins (total residue retained on a No. 325 (45- μ m) sieve), max, percent of the dry pigment	1.0
Consistency by the Stormer viscometer:	
At shearing rate of 100 revolutions/30 s, min, g	700 ^A
At shearing rate of 100 revolutions/35 s, max, g	1200 ^B

^A Equivalent to a rating of 125 Krebs' Units.

^B Equivalent to a rating of 145 Krebs' Units.

3.3 The mass color 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 *General*—Tests shall be conducted in accordance with the appropriate ASTM test methods. Test procedures not covered by ASTM test methods shall be mutually agreed upon between the purchaser and the seller.

5.1.1 *Chemical Analysis*—Test Methods D 50.

5.1.2 *Coarse Particles in Pigments*—Test Method D 185.

5.1.3 *Moisture in Pigments*—Test Method D 280.

5.1.4 *Water Soluble Matter*—Test Method D 1208.

5.1.5 *Hydrogen Ion Concentration*—Test Method D 1208.

5.1.6 *Pigment and Linseed Oil in Paste in Oil*—Test Methods D 1208.

¹ 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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² *Annual Book of ASTM Standards*, Vol 06.03.

6. Keywords

6.1 hydrated; pigment; yellow iron oxide

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