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Standard Specification for Red Lead Pigment¹

This standard is issued under the fixed designation D83; 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.

1. Scope

1.1 This specification covers four grades of red pigment commercially known as red lead. The pigment may be purchased in the dry form or as a paste in oil.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

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:*²

[D49 Test Methods of Chemical Analysis of Red Lead](#)

[D185 Test Methods for Coarse Particles in Pigments](#)

[D1208 Test Methods for Common Properties of Certain Pigments](#)

3. Composition and Properties

3.1 *Dry Pigment*—The pigment shall be made by roasting litharge or metallic lead, or compounds of lead that yield litharge by heating, and shall consist entirely of oxides of lead, free of adulterants. The four grades of pigment shall conform to the following requirements:

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 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.

True red lead (Pb ₃ O ₄), min, %:	
85 % grade	85
95 % grade	95
97 % grade	97
98 % grade	98
Total impurities including moisture, water soluble matter, and matter insoluble in a mixture of nitric acid and hydrogen peroxide, max, %	1.0
Lead monoxide, PbO	remainder
Coarse particles (total residue retained on a 45- μ m (No. 325) sieve), max, %	1.0

When mixed as indicated in the following table, the resulting paint, brushed on a smooth vertical iron surface, shall dry hard and elastic without running, streaking, or sagging:

Dry red lead	20 lb (9.1 kg)
Raw linseed oil	5 pt (2.4 L)
Turpentine	2 gills (0.24 L)
Liquid drier	2 gills (0.24 L)

3.2 *Paste in Oil*—The paste shall be made by thoroughly grinding the specified pigment with linseed oil ([Note 1](#)). The paste as shipped by the seller, and for three months thereafter, shall not be caked in the container, and shall break up readily in oil to form a smooth paint of brushing consistency. The paste shall conform to the following requirements:

Pigment, %	92 to 94
Linseed oil, %	6.0 to 8.0
Moisture and other volatile matter, max, %	0.5
Coarse particles and skins (total residue retained on a No. 325 (45- μ m) sieve), max, % of the dry pigment	1.5

When mixed as indicated in the following table, the resulting paint, brushed on a smooth, vertical iron surface, shall dry hard and elastic without running, streaking, or sagging:

Red lead paste	20 lb (9.1 kg)
Raw linseed oil	3 pt (1.4 L)
Turpentine	2 gills (0.24 L)
Liquid drier	2 gills (0.24 L)

NOTE 1—The storage of paste red lead in places of high temperature should be avoided, as heat accelerates the tendency of this material to cake or harden. Purchasers are cautioned that 85 % grade red lead should not be bought in paste form. The 95 % grade, if made into paste, should be used within a short period of time after grinding. When pure red lead paste is to be stored for a considerable period of time, the 97 % or 98 % grade of red lead should be specified. Therefore the manufacturer shall identify the grade of red lead used in the paste and the date of manufacture.

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 10 000 lb (5000 kg), 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 production unit to form a composite sample.

5. Test Methods

5.1 Tests shall be conducted in accordance with the following 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 **D49**.

5.1.2 *Coarse Particles*—Test Methods **D185**.

5.1.3 *Pigment, Linseed Oil, and Moisture and Other Volatile Matter in Paste in Oil*—Test Methods **D1208**.

6. Keywords

6.1 lead oxide; lead tetra oxide; pigment; red lead

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