

Iron oxide pigments — Specifications and methods of test

ICS 87.060.10

National foreword

This British Standard is the UK implementation of EN ISO 1248:2008. It is identical to ISO 1248:2006, incorporating corrigenda September 2007 and September 2008. It supersedes BS 3981:1976 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee STI/1, Pigments.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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English Version

Iron oxide pigments - Specifications and methods of test (ISO 1248:2006 including Technical Corrigendum 1:2007)

Pigments à base d'oxydes de fer - Spécifications et méthodes d'essai (ISO 1248:2006 Corrigendum technique 1:2007 inclus)

Eisenoxid-Pigmente - Anforderungen und Prüfverfahren (ISO 1248:2006, einschließlich Technische Korrektur 1:2007)

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Foreword

The text of ISO 1248:2006 including Technical Corrigendum 1:2007 has been prepared by Technical Committee ISO/TC 35 "Paints and varnishes" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 1248:2008 by Technical Committee CEN/TC 298 "Pigments and extenders" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2008, and conflicting national standards shall be withdrawn at the latest by September 2008.

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Endorsement notice

The text of ISO 1248:2006 including Technical Corrigendum 1:2007 has been approved by CEN as a EN ISO 1248:2008 without any modification.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 1248 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 2, *Pigments and extenders*.

This second edition cancels and replaces the first edition (ISO 1248:1974), which has been technically revised.

Iron oxide pigments — Specifications and methods of test

1 Scope

This International Standard specifies the requirements and the corresponding methods of test for all manufactured and natural iron oxide pigments, in dry form, suitable for general use. These pigments are identified by Colour Index Nos.¹⁾ red 101 and 102, yellow 42 and 43, brown 6 and 7 and black 11, and includes “rapid-dispersion pigments”.

This International Standard does not cover micaceous iron oxide pigments (see Note 1), transparent iron oxide pigments, granular grey iron oxide (see Note 2) or magnetic iron oxide pigments other than those of Colour Index Pigment black 11.

NOTE 1 The requirements and the corresponding methods of test for micaceous iron oxide pigments are specified in ISO 10601.

NOTE 2 Granular grey iron oxides are too abrasive for general use.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 385-1, *Laboratory glassware — Burettes — Part 1: General requirements*

ISO 648, *Laboratory glassware — One-mark pipettes*

ISO 787-1, *General methods of test for pigments and extenders — Part 1: Comparison of colour of pigments*

ISO 787-2, *General methods of test for pigments and extenders — Part 2: Determination of matter volatile at 105 °C*

ISO 787-3, *General methods of test for pigments and extenders — Part 3: Determination of matter soluble in water — Hot extraction method*

ISO 787-4, *General methods of test for pigments and extenders — Part 4: Determination of acidity or alkalinity of the aqueous extract*

ISO 787-5, *General methods of test for pigments and extenders — Part 5: Determination of oil absorption value*

ISO 787-7, *General methods of test for pigments and extenders — Part 7: Determination of residue on sieve — Water method — Manual procedure*

1) The Colour Index is published by The Society of Dyers and Colourists, PO Box 244, Perkin House, 82 Grattan Road, Bradford, West Yorkshire BD1 2JB, United Kingdom; and the American Association of Textile Chemists and Colorists, National Headquarters, Box 12215, Research Triangle Park, N.C. 27709, USA.

ISO 787-9, *General methods of test for pigments and extenders — Part 9: Determination of pH value of an aqueous suspension*

ISO 787-13, *General methods of test for pigments and extenders — Part 13: Determination of water-soluble sulfates, chlorides and nitrates*

ISO 787-16, *General methods of test for pigments and extenders — Part 16: Determination of relative tinting strength (or equivalent colouring value) and colour on reduction of coloured pigments — Visual comparison method*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

3 Description

The iron oxide pigments covered by this International Standard consist mainly of iron oxides and hydrated iron oxides. Their colours are usually red, yellow, brown or black.

4 Classification

4.1 General

In this International Standard, iron oxide pigments are classified as follows:

- by **groups** depending on their colour;
- by **categories** depending on their iron content, expressed as iron(III) oxide;
- by **types** depending on their content of water-soluble matter and their total content of water-soluble chlorides and sulfates, expressed as the ions Cl^- and SO_4^{2-} ;
- by **grades** depending on their residue on sieve;
- by **classes** depending on their origin.

4.2 Criteria for classification

4.2.1 Groups

Depending on their colour, iron oxide pigments are divided into four groups:

- reds;
- yellows;
- browns;
- blacks.

4.2.2 Categories

Depending on their minimum iron content, expressed as iron(III) oxide, iron oxide pigments are divided into the categories shown in Table 1.

Table 1 — Categories of iron oxide pigments

Group	Category	Minimum iron content, expressed as Fe_2O_3 % (by mass)	Colour Index No.
Red	A	95	Pigment red 101 77491
	B	70	Pigment red 102 77491
	C	50	
	D	10	
Yellow	A	83	Pigment yellow 42 77492
	B	70	Pigment yellow 43 77492
	C	50	
	D	10	
Brown	A	87	Pigment brown 6 77491, 77492 or 77499
	B	70	Pigment brown 7 77491, 77492 and/or 77499
	C	30	
Black	A	95	Pigment black 11 77499
	B	70	

4.2.3 Types

Depending on their content of water-soluble matter and their total content of water-soluble chlorides and sulfates, iron oxide pigments are divided into the types shown in Table 2.

Table 2 — Types of iron oxide pigments

Characteristic	Type I ^a	Type II		Type III	Method of test
	Red and brown only	Red and brown only	Yellow and black only	All pigments	
Matter soluble in water (determined after drying at 105 °C), % (by mass)	≤ 0,3	> 0,3 and ≤ 1	≤ 1	> 1 and ≤ 5	ISO 787-3
Sum of water-soluble chlorides and sulfates, expressed as the ions Cl^- and SO_4^{2-} , % (by mass)	≤ 0,1				ISO 787-13
^a Type I pigments are used in making anticorrosive paints.					

4.2.4 Grades

Depending on their residue on sieve, iron oxide pigments are divided into the grades shown in Table 3.