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General methods of test for pigments and extenders —

Part 25: Comparison of the colour, in full-shade systems, of white, black and coloured pigments — Colorimetric method

Méthodes générales d'essai des pigments et matières de charge — Partie 25: Comparaison, dans les systèmes monopigmentaires, de la couleur des pigments blancs, noirs et colorés — Méthode colorimétrique

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 256, *Pigments, dyestuffs and extenders*.

This second edition cancels and replaces the first edition (ISO 787-25:1993), which has been technically revised. The main changes compared to the previous edition are as follows:

— Clause 3 has been revised and terms and definitions for full shade, mass tone and mass tone system have been added/revised;

— the normative references have been updated;

— the text has been editorially revised.

A list of all parts in the ISO 787 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

General methods of test for pigments and extenders —

Part 25: Comparison of the colour, in full-shade systems, of white, black and coloured pigments — Colorimetric method

1 Scope

This document specifies a general test method for comparing the colour, in full-shade systems, of white, black or coloured pigments with that of an agreed reference pigment, using a colorimetric procedure.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 787-9, *General methods of test for pigments and extenders — Part 9: Determination of pH value of an aqueous suspension*

ISO 787-24, *General methods of test for pigments and extenders — Part 24: Determination of relative tinting strength of coloured pigments and relative scattering power of white pigments — Photometric methods*

ISO 2114, *Plastics (polyester resins) and paints and varnishes (binders) — Determination of partial acid value and total acid value*

ISO 3219, *Plastics — Polymers/resins in the liquid state or as emulsions or dispersions — Determination of viscosity using a rotational viscometer with defined shear rate*

ISO 3262-20, *Extenders for paints — Specifications and methods of test — Part 20: Fumed silica*

ISO 4629-1, *Binders for paints and varnishes — Determination of hydroxyl value — Part 1: Titrimetric method without using a catalyst*

ISO 8780-6, *Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics — Part 6: Dispersion using a triple-roll mill*

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

ISO 18314-1, *Analytical colorimetry — Part 1: Practical colour measurement*

ISO 18314-2, *Analytical colorimetry — Part 2: Saunderson correction, solutions of the Kubelka-Munk equation, tinting strength, hiding power*

ISO 18451-1, *Pigments, dyestuffs and extenders — Terminology — Part 1: General Terms*

ISO 18451-2, *Pigments, dyestuffs and extenders — Terminology — Part 2: Classification of colouring materials according to colouristic and chemical aspects*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 18451-1, ISO 18451-2 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
full shade
colour of a mass tone system in optically infinite (hiding) layer

[SOURCE: ISO 18451-1:2019, 3.41]

3.2
mass tone
colour of a mass tone system in a non-hiding layer

[SOURCE: ISO 18451-1:2019, 3.69]

3.3
mass tone system
pigmented system that contains one pigment only

[SOURCE: ISO 18451-1:2019, 3.70]

4 Principle

The test pigment and an agreed reference pigment are dispersed in a particular test medium, consisting of a mixture of an alkyd resin and fumed silica, using an automatic muller. From the dispersions of the two pigments, specimens on suitable substrates are prepared. The tristimulus values of the specimens are measured as described in ISO 18314-1 and from these, the appropriate colour characteristics (relative hue and amount of relative hue for black and white pigments). Lightness, hue, chroma and total colour difference for coloured pigments are calculated as described in ISO 11664-4.

5 Materials

5.1 Alkyd resin (binder)

The alkyd resin shall consist of 63 % (mass fraction) linseed oil, 23 % (mass fraction) phthalic anhydride and 14 % (mass fraction) trimethylol propane, and shall comply with the following requirements:

		Test method
Acid value	max. 15 mg KOH/g	ISO 2114
Viscosity (of the product as delivered)	7 Pa · s to 10 Pa · s	ISO 3219
Hydroxyl value	30 mg to 50 mg KOH/g	ISO 4629-1

5.2 Fumed silica

The fumed silica shall comply with the following requirements:

		Test method
Specific surface area (BET)	175 m^2/g to 225 m^2/g	ISO 3262-20
pH value of a 4 % dispersion in water	3,6 to 4,5	ISO 787-9

Fumed silica is necessary to avoid flocculation and to control the flow properties of the pigmented system.