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Splošne metode preskušanja pigmentov in polnil - 17. del: Primerjava moči posvetlitve belih pigmentov (ISO/FDIS 787-17:2018)

General methods of test for pigments and extenders - Part 17: Comparison of lightening power of white pigments (ISO/FDIS 787-17:2018)

Allgemeine Prüfverfahren für Pigmente und Füllstoffe - Teil 17: Vergleich des Aufhellvermögens von Weißpigmenten (ISO/FDIS 787-17:2018)

Méthodes générales d'essai des pigments et matières de charge - Partie 17: Comparaison du pouvoir éclaircissant des pigments blancs (ISO/FDIS 787-17:2018)

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General methods of test for pigments and extenders —

Part 17:
Comparison of lightening power of white pigments

Méthodes générales d'essai des pigments et matières de charge —

Partie 17: Comparaison du pouvoir éclaircissant des pigments blancs

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Foreword

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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

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

This third edition cancels and replaces the second edition (ISO 787-17:2002), of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

— Clause 3 on “Terms and definitions”, with a general reference to ISO 18451-1, has been added;

— CAS numbers have been added to the reagents;

— 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 17: Comparison of lightening power of white pigments

1 Scope

This document specifies a general method of test for comparing the lightening (reducing) power of a white pigment with the lightening power of an agreed sample of the same type.

Two procedures (A and B) are specified. Procedure A is quicker than procedure B and is suitable for testing one sample of pigment; procedure B is better for testing several samples, and especially if a pigment of unknown lightening power is being tested.

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 788, *Ultramarine pigments for paints*

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

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 18451-1 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/

4 Reagent

4.1 Blue paste, with the following composition:

— castor oil, medicinal quality: 500 g (CAS-No. 8001-79-4);

— precipitated calcium sulfate, $CaSO_4 \cdot 2H_2O$: 475 g (CAS-No. 10101-41-4);

— ultramarine blue complying with ISO 788: 5 g;

— treated natural earth[1)]: 20 g.

The paste shall be prepared as follows.

Mix the treated natural earth in a beaker with sufficient castor oil to give a uniform paste and then gradually stir in the remaining castor oil. Heat the mixture so obtained to a temperature of 50 °C and,

1) A prepared bentonite is a suitable material.

after maintaining this temperature for about 15 min, stir in the ultramarine blue and calcium sulfate, adding them in small amounts.

Disperse thoroughly the paste obtained, by passing through a roller mill or other suitable machine, and stir to homogenize the paste thoroughly, heating it if necessary.

Store the paste in airtight containers, preferably with screw caps.

5 Apparatus

5.1 Palette knife, with a tapered steel blade of the approximate dimensions 140 mm to 150 mm long, 20 mm to 25 mm wide at its widest point and not less than 12,5 mm wide at its narrowest point.

5.2 Glass slide, clear and colourless, 150 mm × 50 mm or other suitable size.

5.3 Automatic muller, with ground-glass plates, preferably water-cooled, of diameter 180 mm to 250 mm, to which a variable but known force of up to about 1 000 N may be applied. If the automatic muller does not have water-cooled plates, care shall be taken that temperature variation does not occur during the grinding operation. The driven glass plate should preferably have a speed of rotation of between 70 min^{-1} and 120 min^{-1} and the apparatus should preferably have an arrangement for pre-setting the number of revolutions in multiples of 25.

5.4 Plate, of ground glass or marble, for use when an automatic muller is not available.

5.5 Balance, accurate to ±0,001 g.

5.6 Hand muller.

6 Sampling

Take a representative sample of the product to be tested, as described in ISO 15528.

7 Procedure

7.1 Procedure A

7.1.1 Incorporation of the white pigment into the blue paste by means of the automatic muller

Weigh, to the nearest 1 mg, 5 g of the blue paste (4.1) and place it in the middle of the clean lower plate of the muller (5.3). Weigh, to the nearest 1 mg, the quantity (m_0) of the agreed reference pigment indicated in Table 1 and incorporate it into the blue paste by gently working with the palette knife (5.1). When the white pigment has been wetted, spread the paste in a circle of approximately 50 mm diameter around the centre of the lower plate and clean the palette knife by drawing it across the top plate. Close the muller plates, apply a force of about 1 000 N and grind in four stages of 25 revolutions, picking up the paste with the same palette knife and transferring it to the centre of the plate after each stage.

When the grinding has been completed, remove the paste and store it on a palette.

7.1.2 Incorporation of the white pigment into the blue paste by means of a hand muller or palette knife

Weigh, to the nearest 1 mg, 5 g of the blue paste and place it on the ground-glass or marble plate (5.4). Weigh, to the nearest 1 mg, the quantity (m_0) of the agreed reference pigment indicated in Table 1 and disperse it using the palette knife or a hand muller for 5 min with as little of the blue paste as possible,

to obtain a smooth paste. Add the remainder of the blue paste, a little at a time, to the rubbed-out mixture and thoroughly mix with the palette knife or hand muller, scraping up the paste frequently to ensure thorough mixing.

Remove the paste, as prepared, from the plate and store it on a palette.

Table 1 — Initial weights of reference pigments for procedure 1

Reference pigment	Quantity to be taken m_0 g
Zinc oxide or lithopone 30 %	0,500
High-grade zinc sulfide	0,200
Titanium dioxide	0,100

7.1.3 Procedure for the comparison

Treat the test sample (see Clause 6) in exactly the same manner as in 7.1.1 or 7.1.2 and determine the quantity of pigment (m_1) which gives an intensity of colour equal to that of the paste of the agreed reference pigment.

Spread the two pastes made with the test sample and with the agreed reference pigment in the same direction on the glass slide (5.2) in opaque strips not less than 25 mm wide with touching edges not less than 40 mm long. Compare the pastes for intensity of colour by examining the two strips in diffuse daylight through the glass, and on the surface, immediately after application. Where good daylight is not available, make the comparison in artificial daylight.

7.2 Procedure B

7.2.1 Incorporation of the white pigment into the blue paste by means of the automatic muller

Prepare a series of standard pastes from the agreed reference pigment, with the quantities indicated in Table 2 and using the following procedure in each case.

Weigh, to the nearest 1 mg, 5 g of the blue paste (4.1) and place it in the middle of the clean lower plate of the muller (5.3). Weigh, to the nearest 1 mg, one of the stated quantities of the agreed reference pigment indicated in Table 2 and incorporate it into the blue paste by gently working with the palette knife (5.1). When the pigment has been wetted, spread the paste in a circle of approximately 50 mm diameter around the centre of the lower plate and clean the palette knife by drawing it across the top plate. Close the muller plates, apply maximum force and grind in four stages of 25 revolutions, picking up the paste with the same palette knife and transferring it to the centre of the plate after each stage.

When the grinding has been completed, remove the paste from the plate and store it on a palette.

Repeat the above procedure using in turn each of the other stated quantities of white pigment (see Table 2) and store the pastes on a palette.

Table 2 — Initial weights of reference pigments for procedure 2 and relative lightening power of test sample

Quantities to be taken of agreed reference pigment			Relative lightening power of test sample (see 8.2)
Zinc oxide or lithopone 30 % ZnS	High-grade zinc sulfide	Titanium dioxide	
g	g	g	%
0,400	0,160	0,080	80
0,450	0,180	0,090	90
0,500	0,200	0,100	100
0,550	0,220	0,110	110
0,600	0,240	0,120	120

7.2.2 Incorporation of the white pigment into the blue paste by means of a hand muller or palette knife

Weigh, to the nearest 1 mg, 5 g of the blue paste and place it on the ground-glass or marble plate (5.4). Weigh, to the nearest 1 mg, one of the stated quantities of the agreed reference pigment indicated in Table 2 and disperse it using the palette knife or hand muller for 5 min with as little of the blue paste as possible, to obtain a smooth paste. Add the remainder of the blue paste, a little at a time, to the rubbed-out mixture and thoroughly mix with the palette knife or hand muller, scraping up the paste frequently to ensure thorough mixing.

Remove the paste, as prepared, from the plate and store it on a palette.

Repeat the above procedure using in turn each of the other stated quantities of white pigment (see Table 2) and store the pastes on a palette.

7.2.3 Procedure for the comparison

Carry out the same procedure as in 7.2.1 or 7.2.2 using:

— 0,500 g of the pigment under test in the case of zinc oxide or lithopone 30 %;

— 0,200 g of the pigment under test in the case of high-grade zinc sulfide;

— 0,100 g of the pigment under test in the case of titanium dioxide.

Select two of the series of prepared reference pastes as being closest in intensity of colour to the paste made from the test sample.

Spread the paste from the test sample and the two selected reference pastes in the same direction on the glass slide (5.2) in opaque strips not less than 25 mm wide with touching edges not less than 40 mm long. Compare the pastes for intensity of colour by examining the strips in diffuse daylight through the glass, and on the surface, immediately after application. Where good daylight is not available, make the comparison in artificial daylight.

