BRITISH STANDARD

BS EN ISO
8780-5:1995
Incorporating
Amendment No. 1

Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics —

Part 5: Dispersion using an automatic muller

The European Standard EN ISO 8780-5:1995 has the status of a British Standard

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Pigments, Paints and Varnishes Standards Policy Committee (PVC/-) to Technical Committee PVC/1, upon which the following bodies were represented:

Aluminium Powder and Paste Association
British Cement Association
British Railways Board
Chemical Industries' Association
Oil and Colour Chemists Association
Paintmakers' Association of Great Britain Ltd.
Titanium Pigment Manufacturers Technical Committee
Zinc Development Association

This British Standard, having been prepared under the direction of the Pigments, Paints and Varnishes Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 30 April 1991

The following BSI references relate to the work on this standard:
Committee reference PVC/1
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Amendments issued since publication

Amd. No.	Date	Comments
8526	August 1995	Indicated by a sideline in the margin

Contents

National foreword

This Part of BS 3483 has been prepared under the direction of the Pigments, Paints and Varnishes Standards Policy Committee. It is identical with ISO 8780-5:1990 "*Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics — Part 5: Dispersion using an automatic muller*", published by the International Organization for Standardization (ISO).

In 1994 the European Committee for Standardization (CEN) accepted ISO 8780-5:1990 as European Standard EN ISO 8780-5:1995. As a consequence of implementing the European Standard this British Standard is renumbered as BS EN ISO 8780-5 and any reference to BS 3483-D5 should be read as a reference to BS EN ISO 8780-5.

Cross-references

International Standard	Corresponding British Standard
ISO 842:1984	BS 4726:1986 *Methods for sampling raw materials for paints and varnishes* (Identical) BS 3483 *Methods of testing pigments for paints*
ISO 8780-1:1990	Part D1:1991 *Methods of dispersion for assessment of dispersion characteristics (Introduction)* (Identical)
ISO 8781-1:1990	Part E1:1991 *Assessment of dispersion characteristics from the change in tinting strength of coloured pigments* (Identical)
ISO 8781-2:1990	Part E2:1991 *Assessment of dispersion characteristics from the change in fineness of grind* (Identical)
ISO 8781-3:1990	Part E3:1991 *Assessment of dispersion characteristics from the change in gloss* (Identical)

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN ISO title page, pages 2 to 6, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 8780-5

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English version

Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics — Part 5: Dispersion using an automatic muller

(ISO 8780-5:1990)

Pigments et matières de charge — Méthodes de dispersion pour évaluer la dispersibilité — Partie 5: Dispersion à l'aide d'une broyeuse automatique à plateaux
(ISO 8780-5:1990)

Pigmente und Füllstoffe — Dispergierverfahren zur Beurteilung des Dispergierverhaltens — Teil 5: Dispergieren mit einer Teller-Farbenausreibmaschine
(ISO 8780-5:1990)

This European Standard was approved by CEN on 1994-10-17. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

This European Standard has been taken over by Technical Committee CEN/TC 298, Pigments and extenders, from the work of ISO/TC 35, Paints and varnishes, of the International Organization for Standardization (ISO).

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 1995, and conflicting national standards shall be withdrawn at the latest by September 1995.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

NOTE Normative references to international publications are given in Annex ZA (normative).

Contents

1 Scope

This part of ISO 8780 specifies a method for the dispersion of pigments and extenders using an automatic muller. It is suitable for comparing small samples in the quality control of pigments. This part of ISO 8780 is for use in conjunction with the methods of assessment described in ISO 8781, using an agreed binder system of high viscosity free from volatile solvents. It should be read in conjunction with ISO 8780-1.

This method is restricted to high-viscosity mill bases. The results obtained are not for comparison with dispersibility results obtained using other methods of dispersion.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 8780. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 8780 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 842:1984, *Raw materials for paints and varnishes — Sampling.*

ISO 8780-1:1990, *Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics — Part 1: Introduction.*

ISO 8781-1:1990, *Pigments and extenders — Methods of assessment of dispersion characteristics — Part 1: Assessment from the change in tinting strength of coloured pigments.*

ISO 8781-2:1990, *Pigments and extenders — Methods of assessment of dispersion characteristics — Part 2: Assessment from the change in fineness of grind.*

ISO 8781-3:1990, *Pigments and extenders — Methods of assessment of dispersion characteristics — Part 3: Assessment from the change in gloss.*

3 Required supplementary information

For any particular application, the test method specified in this part of ISO 8780 needs to be completed by supplementary information. The items of supplementary information are given in Annex A.

4 Apparatus

Ordinary laboratory apparatus and glassware, together with the following:

4.1 *Automatic muller,* with ground-glass plates (see clause **8**, third paragraph). The plates shall be of diameter 180 mm to 250 mm to which a variable and known force of up to 1 kN may be applied. The driven plate shall be capable of rotating at between 70 r/min and 120 r/min and the apparatus shall have an arrangement for pre-setting the number of revolutions in multiples of 25.

4.2 *Spatula,* with flexible steel or plastic blade.

5 Binder system

The binder system shall be agreed on between the interested parties. The test report shall state the binder, the solvent and the concentration of the binder in the solvent, as well as giving information on the rheological properties (for example viscosity) of the binder system.

The same batch of binder system shall be used for all tests in the same series.

NOTE 1 To improve the precision of the method, it is recommended that binder systems free from volatile solvents are used.

6 Sampling

Take a representative sample of the product to be tested, as described in ISO 842.

7 Mill base composition

The flow characteristics of a mill base depend on the binder demand of the pigment, its concentration in the mill base and the rheological properties of the binder system. Preliminary experiments shall therefore be carried out to ascertain a suitable mill base composition.

In order to compare the dispersibilities of different pigments, it is important that the flow characteristics of the mill bases are similar and that mill bases are in the form of a sticky paste. This may necessitate the use of mill bases of different compositions.

Typical pigment concentrations are:

a) pigments of low binder demand — pigment concentration 65 % (*m*/*m*);

b) pigments of medium binder demand — pigment concentration 40 % (*m*/*m*);

c) pigments of high binder demand — pigment concentration 25 % (*m*/*m*).

8 Procedure

If there are no water-cooled plates, take care that the temperature during the dispersion operation does not rise by more than 10 °C.

Pre-condition new muller plates by milling a pigment in a suitable binder (system) for 1 000 revolutions with a load applied to the plates. Remove and discard the paste.

Before use, check that the surfaces of each plate have an even, opaque appearance and are free from score marks and polished areas.

8.1 Dispersion

Weigh out agreed amounts of the binder system (clause **5**) and pigment.

The amounts weighed depend on the size of the muller plates. If the paste exudes from the edges of the plates during dispersion, the amount of the mill base shall be reduced appropriately.

If the criterion for assessing the dispersion characteristics is to be the evaluation of the development of tinting strength (see ISO 8781-1), the masses of the pigment and of the binder system shall be determined to within 0,5 %. For other methods of assessment (for example fineness of grind, see ISO 8781-2, and change of gloss, see ISO 8781-3), wider tolerance ranges may be agreed on.

Place the binder system in the centre of the lower plate of the automatic muller (**4.1**). Sprinkle the pigment into the binder and mix together, using the minimum effort, with the aid of the spatula (**4.2**). Distribute the paste at several points at a distance of about 35 mm from the centre of the lower plate or spread it in the form of a ring with an internal diameter of 40 mm and an external diameter of 100 mm.

NOTE 2 It is advisable to lay a paper ring of the requisite shape as a pattern beneath the lower plate.

Clean the spatula as much as possible by wiping it on the face of the upper plate of the muller.

Close the plates of the muller and grind the mixture under an agreed load at an agreed rotational frequency and for an agreed number of revolutions in several successive stages (for example 50, 100, 200 and 400 revolutions, as shown in Figure 1). Mid-way through each stage (for example after 25, 75, 150 or 300 revolutions), and at the end of each stage, homogenize the mill base by scraping together with the spatula, mixing (using minimum effort) and redistributing it as described above. Take a test portion at the end of each stage as agreed.

When more than two test portions, or a test portion amounting to 15 % of the paste, have been taken, repeat the procedure on fresh mill base mixtures for each grinding stage.

8.2 Stabilization

If necessary, for example if the mill base is not stable enough, stabilize each test portion after its removal from the mill base by adding, for example, more binder and/or special additives. The procedure shall be agreed on between the interested parties.

9 Test report

The test report shall contain at least the following information:

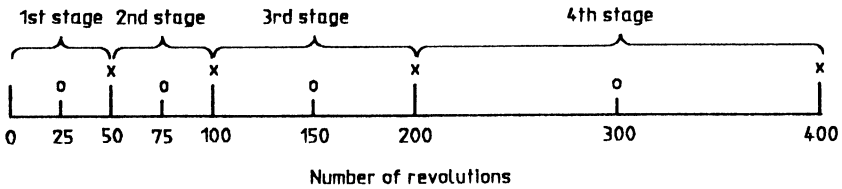
a) all details necessary to identify the product tested;

b) a reference to this part of ISO 8780;

c) the items of supplementary information referred to in Annex A;

d) any deviation from the procedure specified;

e) the date(s) of the test.



Key :

o homogenize

x homogenize and take a test portion as agreed.

Figure 1 — Example of grinding schedule

Annex A (normative)
Required supplementary information

The items of supplementary information listed in this annex shall be supplied as appropriate to enable the method to be carried out.

The information required should preferably be agreed between the interested parties and may be derived, in part or totally, from an international or national standard or other document related to the product under test.

a) Type and complete details of the automatic muller (see **4.1**).

b) Binder system (see clause **5**).

c) Composition of the mill base (see clause **7**) and its temperature (see clause **8**).

d) Dispersion conditions (load on the muller plates, and rotational frequency and number of revolutions of the plates) (see **8.1**).

e) Stabilization procedure (see **8.2**).

Annex ZA (normative)
Normative references to international publications with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

Publication	Year	Title	EN	Year
ISO 8781-1	1990	*Pigments and extenders — Methods of assessment of dispersion characteristics* *Part 1: Assessment from the change in tinting strength of coloured pigments*	EN ISO 8781-1	1995
ISO 8781-2	1990	*Pigments and extenders — Methods of assessment of dispersion characteristics* *Part 2: Assessment from the change in fineness of grind*	EN ISO 8781-2	1995
ISO 8781-3	1990	*Pigments and extenders — Methods of assessment of dispersion characteristics* *Part 3: Assessment from the change in gloss*	EN ISO 8781-3	1995
ISO 8780-1	1990	*Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics* *Part 1: Introduction*	EN ISO 8780-1	1995

Publication(s) referred to

See national foreword.

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