BRITISH STANDARD

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14469-3:2004

Pigments and extenders — Testing of colouring materials in plasticized polyvinyl chloride (PVC-P) —

Part 3: Determination of the relative tinting strength of white pigments

The European Standard EN 14469-3:2004 has the status of a British Standard

ICS 83.040.30

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National foreword

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Pigments and extenders - Testing of colouring materials in plasticized polyvinyl chloride (PVC-P) - Part 3: Determination of the relative tinting strength of white pigments

Pigments et matières de charge - Essai des matières colorantes dans le chlorure de polyvinyle plastifié (PVC-P) - Partie 3: Détermination du pouvoir colorant relatif des pigments blancs

Pigmente und Füllstoffe - Prüfung von Farbmitteln in weichmacherhaltigem Polyvinylchlorid (PVC-P) - Teil 3: Bestimmung des relativen Aufhellvermögens von Weißpigmenten

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 14469-3:2004) has been prepared 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of an identical text or by endorsement, at the latest by October 2004, and conflicting national standards shall be withdrawn at the latest by October 2004.

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1 Scope

This Part of EN 14469 specifies a procedure for determining the relative tinting strength of white pigments in plasticized polyvinyl chloride (PVC-P) at identical concentration of the white pigments by mass. To this end, the white pigments are incorporated into the basic mixture A (see EN 14469-1) together with a carbon black pigment preparation.

2 Normative references

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).

EN 14469-1, *Pigments and extenders – Testing of colouring materials in plasticized polyvinyl chloride (PVC-P) – Part 1: Compositions and preparation of basic mixtures.*

EN ISO 787-24, *General method of tests for pigments and extenders - Part 24: Determination of relative tinting strength of coloured pigments and relative scattering power of white pigments - Photometric methods (ISO 787-24:1985).*

EN ISO 15528, *Paints, varnishes and raw materials for paints and varnishes - Sampling (ISO 15528:2000).*

ISO 7724-2; *Paints and varnishes – Colorimetry - Part 2: Colour measurement.*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
tinting strength
TS
capability of a pigment to increase the lightness in colour of a coloured, grey or black medium

3.2
relative tinting strength
TS_r
ratio of the tinting strength of the sample TS_P to the tinting strength of an agreed reference pigment TS_{RP}, expressed as a percentage:

$$TS_r = \frac{TS_P}{TS_{RP}} \times 100 \quad (1)$$

Note For further details see EN ISO 787-24.

4 Apparatus and materials

4.1 Two-roll mill

which can be heated, with an adjustable distance between the rolls, roll diameters shall be between 80 mm and 200 mm and the ratio of the speed of rotations of the two rollers shall be between 1:1,1 and 1:1,2.

NOTE The rolls used should preferably have a chromed surface.

4.2 Plate press (if required according to 6.1.4)

which can be heated and cooled.

4.3 Photometer

for determining the colorimetric data.

4.4 Basic mixture A

as defined in EN 14469-1.

4.5 Carbon black pigment preparation

based on an easily dispersing grade of carbon black.

5 Sampling

Representative samples of the colouring material to be tested and from the reference pigment shall be taken as described in EN ISO 15528.

6 Procedure

6.1 Preparation of the test specimens

6.1.1 Premixing

Weigh 100 parts of basic mixture A (4.4), 4 parts of the white pigment and an appropriate quantity of a carbon black pigment preparation (4.5) into a plastic beaker and mix well using a spatula.

The quantity of the carbon black pigment preparation shall besuch that the sheet produced has a reflection value of between 30 % and 60 %.

6.1.2 Two-roll milling at (160 ± 5) °C

The mix is placed on the two-roll mill, the roll surfaces of which have been adjusted to a temperature of (160 ± 5) °C. A temperature difference between the rolls is permissible if it is within these limits. The amount of mix is judged so that once a milled sheet has formed there is always a rotating bank of molten material in the gap between the rolls. The gap between the rolls is to be adjusted so that the milled sheet has a uniform thickness of 0,4 mm to 0,5 mm.

The sheet is formed in such a way that the whole of the material forms a continuous sheet on the front roll. During the rolling process, the milled sheet shall be continuously turned over or removed and reapplied, so as to give thorough mixing.

After the mix has been applied it should be worked for 200 roll revolutions. The rolling time shall be at least 5 min and not exceed 10 min.

The milled sheet is then drawn off. To this end, it is permissible to change the gap between the rolls and, if desired, the speed of rotation and friction.

6.1.3 Two-roll milling at (130 ± 5) °C

The milled sheet produced as defined in 6.1.2 is used. The gap between the rolls is adjusted, and then left unchanged during the rolling process, so as to give a milled sheet of from 0,4 mm to 0,5 mm thickness. The roll temperatures are held at (130 ± 5) °C.

The rolled sheet is firstly passed unfolded through the gap between the rolls. It is then folded once and passed through the gap again. This procedure is repeated ten times.

NOTE A sheet, which after rolling is no longer smooth, can be finished by rolling for about 1 min at (160 ± 5) °C and then drawn off.

6.1.4 Pressing of test specimens

It may be necessary to press the milled sheet in order to improve the surface quality, e.g. to achieve high gloss or to create a sufficiently thick sample for photometric measurement.

NOTE Photometric measurement can also be carried out directly on the rotating sheet.

The section of sheet and a spacer frame of the desired thickness, minimum 1 mm, are placed between high-gloss chromed plates in a plate press heated to a temperature between 165 °C and 170 °C , and pressed for not more than 2 min. The pressed film is then cooled rapidly. After pressing, a 50 mm $\times$ 50 mm test sample is produced.

6.2 Measurement of the colorimetric data

Measure the colorimetric data of the samples as defined in ISO 7724-2, i.e. including surface reflection.

7 Evaluation

The relative tinting strength is obtained as defined in EN ISO 787-24.

8 Test report

The test report shall contain at least the following information:

a) all details needed to identify the white pigment tested and the agreed reference pigment;

b) reference to this European Standard (EN 14469-3);

c) photometric data and how obtained;

d) relative tinting strength;

e) description of the carbon black pigment and the pigment preparation used (type, concentration, form);

f) any deviation from the test method specified;

g) date of testing.

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