BRITISH STANDARD

BS EN
13900-1:2003

Pigments and extenders — Methods of dispersion and assessment of dispersibility in plastics —

Part 1: General introduction

The European Standard EN 13900-1:2003 has the status of a British Standard

ICS 83.040.30

BSI
British Standards

National foreword

This British Standard is the official English language version of EN 13900-1:2003.

The UK participation in its preparation was entrusted to Technical Committee STI/1, Pigments, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled "International Standards Correspondence Index", or by using the "Search" facility of the *BSI Electronic Catalogue* or of British Standards Online.

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

Compliance with a British Standard does not of itself confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 21 February 2003

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 5 and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

ISBN 0 580 41284 9

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13900-1

February 2003

ICS 83.040.30

English version

Pigments and extenders - Methods of dispersion and assessment of dispersibility in plastics - Part 1: General introduction

Pigments et matières de charge - Méthodes de dispersion et évaluation des caractéristiques de dispersibilité dans les plastiques - Partie 1: Introduction générale

Pigmente und Füllstoffe - Dispergierverfahren und Beurteilung der Dispergierbarkeit in Kunstoffen - Teil 1: Allgemeine Einleitung

This European Standard was approved by CEN on 12 December 2002.

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 Management Centre 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 13900-1:2003 E

Foreword

This document (EN 13900-1:2003) 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 August 2003, and conflicting national standards shall be withdrawn at the latest by August 2003.

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

1 Scope

This part of this European Standard provides an introduction to the various parts of this European Standard which describe methods for dispersing pigments and extenders in plastics materials in order to determine their dispersion characteristics and colouristic properties.

Methods of assessing dispersion characteristics are described in the subsequent parts of this European Standard.

The various procedures described permit comparison to be made between similar pigments (for example between a test sample and an agreed reference pigment). The results provide an indication of relative dispersibility under practical conditions of use, provided that the test procedure and plastics material selected are appropriate.

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 13900-2, *Pigments and extenders - Methods of dispersion and assessment of dispersibility in plastics – Part 2: Determination of colouristic properties and ease of dispersion in plasticized polyvinyl chloride by two-roll milling.*

EN 13900-3, *Pigments and extenders - Methods of dispersion and assessment of dispersibility in plastics – Part 3: Determination of colouristic properties and ease of dispersion of black and colour pigments in polyethylene by two-roll milling.*

prEN 13900-4, *Pigments and extenders - Methods of dispersion and assessment of dispersibility in plastics – Part 4: Determination of colouristic properties and ease of dispersion of white pigments in polyethylene by two-roll milling.*

3 Terms and definitions

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

3.1
dispersibility
ease and extent to which pigments or extenders can, by wetting, elimination of air and by mechanical disagglomeration, be distributed homogeneously in a plastics material under standardized conditions of processing

NOTE Dispersibility is generally assessed in terms of colour strength development, colouristic properties and frequency and size of agglomerates.

3.2
ease of dispersion (DH)
measure of the rate at which or the degree to which a pigment or extender achieves a given level of dispersion when dispersed in a plastics material

3.3
aggregate
primary particles so joined together that they cannot be broken down during normal pigment/extender dispersing processes

3.4
agglomerate
primary particles or aggregates or a mixture of the two so joined together that they may be broken down during normal pigment/extender dispersing processes

4 Methods of dispersion and methods of assessment

4.1 Preliminary agreements

Agreement shall be reached between the interested parties on:

a) the plastics material to be used;

b) the method of dispersion;

c) the assessment method;

as all of these influence the results.

4.2 Plastics materials

A large variety of plastics materials is available with greatly differing properties. It is therefore not possible, in this part of this European Standard, to stipulate which plastics material shall be used. In other parts of this European Standard, general indications are given as to the relevance of the procedures described to the most commonly used plastics materials.

4.3 Methods of dispersion

There are many differences in the equipment and processing conditions used in practice for dispersing pigments and extenders in plastics materials. It is therefore not possible to specify a single procedure for dispersing a pigment for testing purposes. In other parts of this European Standard, general indications are given as to the relevance in practice of the procedure described.

4.4 Methods of assessment

There are different methods of characterising dispersibility of pigments in plastics materials. These are described in the relevant parts of this European Standard.

5 Procedures

5.1 Determination of colouristic properties and ease of dispersion in plasticized polyvinyl chloride by two-roll milling

Using a two-roll mill, the pigment under test is dispersed at 160 °C ± 5 °C in the basic compound. The milled sheet obtained in this way is then subjected to the higher shearing forces resulting from two-roll milling at 130 °C ± 5 °C. The resulting increase in colour strength is a measure of the ease of dispersion $DH_{PVC\text{-}P.}$

For details see EN 13900-2.

5.2 Determination of colouristic properties and ease of dispersion of black and colour pigments in polyethylene by two-roll milling

Using a two-roll mill, the pigment under test is dispersed at a appropriate temperature in the polymer. The milled sheet obtained in this way is then subjected to the higher shearing forces resulting from two-roll milling at a narrower gap width. The resulting increase in colour strength is a measure of the ease of dispersion $DH_{PE.}$

For details see EN 13900-3.

5.3 Determination of colouristic properties and ease of dispersion of white pigments in polyethylene by two-roll milling

Using a two-roll mill, the pigment under test is dispersed at a appropriate temperature in the polymer. The milled sheet obtained in this way is then subjected to the higher shearing forces resulting from two-roll milling at a narrower gap width. The resulting increase in tinting strength is a measure of the ease of dispersion DH_{PE}.

For details see prEN 13900-4.

5.4 Determination of dispersibility of pigments by filter value test

The increase in pressure when pressing a pigmented polymer of defined composition through a filter pack in an extruder under defined conditions is a measure of the dispersibility of the pigment under test.

For details see prEN 13900-5 (draft standard in preparation).

5.5 Determination of dispersibility of pigments by film test

The assessment based on the size and frequency of agglomerates in a pigmented polymer film of defined composition and thickness is a measure of the dispersiblitiy of the pigment under test. The method can be used both for transparent and non-transparent films.

For detail see prEN 13900-6 (draft standard in preparation).

6 Precision

Statements on precision of the methods are given in the subsequent parts of this European Standard. These will generally be limited by the dependence of the results on the choice of plastics material and the method of dispersion employed.

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001. Email: orders@bsi-global.com. Standards are also available from the BSI website at http://www.bsi-global.com.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: +44 (0)20 8996 7111. Fax: +44 (0)20 8996 7048. Email: info@bsi-global.com.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: +44 (0)20 8996 7002. Fax: +44 (0)20 8996 7001. Email: membership@bsi-global.com.

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsi-global.com/bsonline.

Further information about BSI is available on the BSI website at http://www.bsi-global.com.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL