BRITISH STANDARD

BS EN
12575:1998

Plastics — Thermoset moulding compounds — Determination of the degree of fibre wet out in SMC

The European Standard EN 12575:1998 has the status of a British Standard

ICS 83.080.10; 83.120

National foreword

This British Standard is the English language version of EN 12575:1998.

The UK participation in its preparation was entrusted to Technical Committee PRI/42, Fibre reinforced thermosetting plastics and prepregs, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible 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 Standards Catalogue under the section entitled "International Standards Correspondence Index", or by using the "Find" facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

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.

This British Standard, having been prepared under the direction of the Sector Board for Materials and Chemicals, was published under the authority of the Standards Board and comes into effect on 15 November 1998

ISBN 0 580 30020 X

Amendments issued since publication

Amd. No.	Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12575

May 1998

ICS 83.120; 83.140.10

Descriptors: Plastics, reinforced plastics, plastic moulding, reinforcing materials, thermosetting resins, composition: property, tests, determination, rates: per unit time, wetting

English version

Plastics — Thermoset moulding compounds — Determination of the degree of fibre wet out in SMC

Plastiques — Compositions de moulage à base de thermodurcissables — Détermination du taux de mouillage des fibres dans les SMC

Kunststoffe — Härtbare Formmassen — Bestimmung des Faserbenetzungsgrades in SMC

This European Standard was approved by CEN on 1 May 1998.

CEN

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

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

Ref. No. EN 12575:1998 E

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 249, Plastics, the secretariat of which is held by IBN.

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 November 1998, and conflicting national standards shall be withdrawn at the latest by November 1998.

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Contents

Introduction

This test method provides a common basis for reinforcement manufacturers, compounders and moulders to compare data and follow the consistency of wet out. As wet out often improves during the first 24 h, samples of the same age are used for comparison purposes.

In a production situation the process and formulation are assumed to be constant and are sufficient to produce a visual standard level of wet out. Any drifts in paste viscosity, reinforcement fibre content, mass per unit area, compaction structure etc. which adversely affect wet out can be identified.

In a development situation the compounding process conditions need to define an acceptable wet out of the control.

Formulation or reinforcement specimens can be screened along with the control under identical process conditions.

The test is carried out after compounding allowing the products under test to be judged superior or inferior to the control.

1 Scope

This European Standard specifies a test method to determine the degree of wet out of the reinforcement in a sheet moulding compound (SMC).

It is applicable for quality control by the user of the SMC as well as for the process control during the SMC production.

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.

ISO 472, *Plastics — Vocabulary.*

ISO 8604, *Plastics — Prepregs — Definitions of terms and symbols for designations.*

3 Definitions

For the purposes of this standard, the terms and definitions of ISO 472 and 8604 and the following definitions apply:

3.1

fibre bundle

discrete collection of many parallel fibre filaments, chopped or unchopped

3.2

wet out

state in which all the reinforcing bundles in the SMC sheet, not necessarily each individual filament, are wet by the paste

4 Sampling

From each item to be controlled (one roll or a sheet of SMC), obtain a laboratory sample consisting of a strip of 40 cm minimum accross the entire width of the SMC sheet.

5 Apparatus

— *Ruler* (solvent resistant);

— *Sampling table* (approximately 100 cm × 180 cm).

— *Solvent resistant opaque plate*, with a 10 cm × 10 cm inspection window (reading field) in its centre.

— *Solvent resistant gloves.*

— *Magnifying glass* (magnification 10 ×).

— *Disposable spatula* (such as tongue depressors).

6 Procedure

6.1 Carry out the test immediately after compounding.

This procedure can be used as a quality control test at any specified time after manufacture.

6.2 Remove the top carrier film from the sample. Use the spatula to split the SMC at different levels of the sheet.

This results in a cross section of the SMC sheet in which one can observe the fibres on the top, middle and bottom of the SMC at the same time (see Figure 1).

If the degree of wet out is 100 %, the use of the inspection window is unnecessary.

6.3 If there are dry spots, take a new sample and split it across the entire width along the level containing the most dry areas as previously observed (**6.2**).

Divide the sample into four identical strips of 10 cm length perpendicular to the machine direction and choose the strip which contains the largest dry spots (see Figure 2).

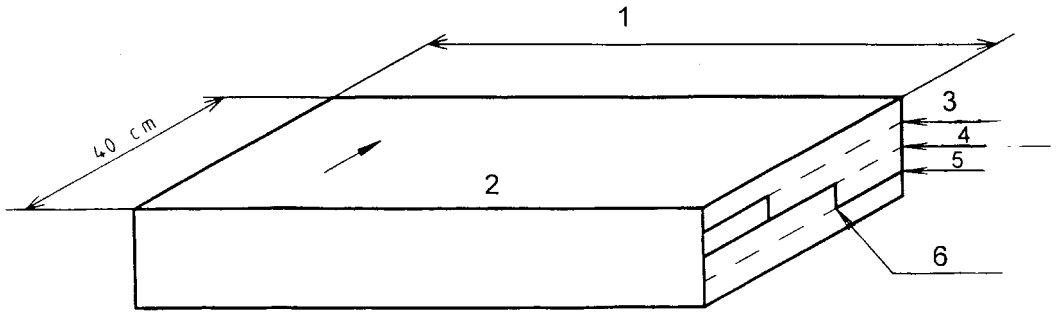
6.4 Inspect the wet out conditions by moving the inspection window in 10 cm steps from left to right.

In each 10 cm square (reading field), use the ruler to measure the dimensions of the dry spots to determine the surface area in square centimetres and record the readings. Summarize these readings to achieve the dry spot area of each reading field (Z_i).

NOTE 1 The use of a magnifying glass when necessary, especially in the case of light colours, high filler content and low solubility sizing of the reinforcing fibres is recommended.

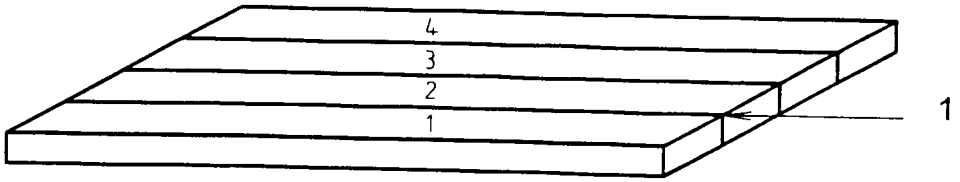
NOTE 2 Pushing down on the SMC with any object (hands, spatula, knife, elbow etc.) will generally move the paste off the fibres and cause a defect.

NOTE 3 Should any particular area parallel to the machine direction repeatedly exhibit a defect, the determination of the special cause of this defect allows its correction (i.e. wrinkles in film or partial blockage of the doctor blade).



1) Width
2) Machine direction
3) Top
4) Middle
5) Bottom
6) Level of split

Figure 1



1) Chosen strip

Figure 2

7 Expression of results

Degree of fibre wet out is obtained by the equation:

$$D_W = 100 - \frac{\sum_{i=1}^{n} Z_i}{n \times A} \times 100$$

where:

- D_W is the degree of fibre wet out in per cent;
- n is the number of reading fields;
- Z_i is the total dry spot area of an individual reading field in square centimetres;
- A is the surface of the reading field (inspection window) in square centimetres

8 Test report

The test report shall include the following details:

8.1 Reference to this European Standard.

8.2 Formulation/designation of the SMC.

8.3 Date of production, batch number.

8.4 Number of reading fields of the inspected line (specimen).

8.5 Degree of fibre wet out (D_W).

8.6 Special defect, its exact description and location, i.e. largest single dry spot of the inspected strip with the number of the respective reading field (see Figure 3).

For production control purposes the following information shall be added:

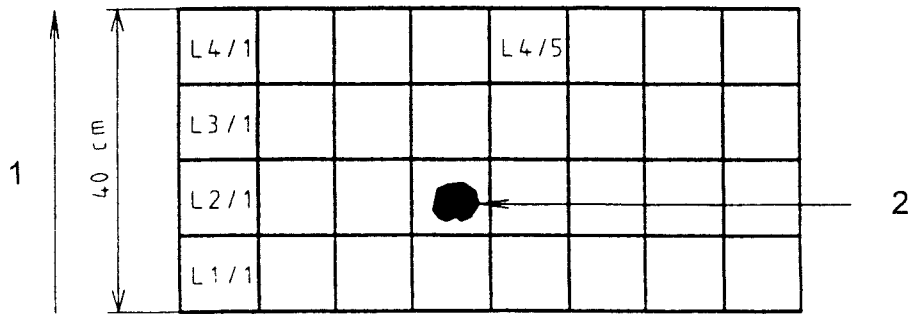
8.7 Time between production, sampling and testing.

8.8 Temperature of the production room.

8.9 Relative humidity of the production room.

9 Precision

The precision of this method is not known because interlaboratory data are not available. When interlaboratory data are obtained, a precision statement will be added with the next revision.



1) Machine direction
2) Largest single spot
Strip 2
field 4 L 2/4

Figure 3

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: 020 8996 9000. Fax: 020 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: 020 8996 9001. Fax: 020 8996 7001.

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: 020 8996 7111. Fax: 020 8996 7048.

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: 020 8996 7002. Fax: 020 8996 7001.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL