

Polyester moulding compounds for electrical and other purposes —

Part 1: Methods of test

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Plastics Standards Policy Committee (PLM/-) to Technical Committee PLM/38, upon which the following bodies were represented:

- BEAMA Ltd.
- British Marine Industries Federation
- British Plastics Federation
- British Resin Manufacturers' Association
- British Telecommunications plc
- Chemical Industries Association
- EEA (the Electronics and Business Equipment Association)
- ERA Technology Ltd.
- Electrical and Electronic Insulation Association (BEAMA Ltd.)
- Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)
- Federation of Resin Formulators and Applicators Ltd.
- Ministry of Defence
- Process Plant Association
- Society of British Aerospace Companies Limited
- Society of Chemical Industry
- Standards Association of Australia

This British Standard, having been prepared under the direction of the Plastics Standards Policy Committee, was published under the authority of the Board of BSI and comes into effect on 28 October 1990

© BSI 10-1999

First published December 1979
Second edition October 1990

The following BSI references relate to the work on this standard:
Committee reference PLM/38
Draft for comment 88/40654 DC

ISBN 0 580 18902 3

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Definition	1
3 Method 1: Method for the determination of mass per unit area and mass distribution of uncured sheet compounds	1
4 Method 2: Method for the determination of glass content of both cured and uncured materials	2
5 Method 3: Method for the determination of deflection under load at 100 °C of cured materials	3
6 Method 4: Method of test for oxygen index of cured materials	4
7 Method 5: Method for the determination of temperature index of cured materials	4
8 Method 6: Power arc test of cured materials	4
9 Method 7: Inclined-plane tracking test of cured materials	6
10 Method 8: Flexural strength of cured materials	6
11 Method 9: Flexural strength at elevated temperature of cured materials	6
12 Method 10: Flexural modulus of cured materials	6
13 Method 11: Impact strength of cured materials	6
Appendix A Adjustment of natural frequency and damping of test circuit for power arc test of cured materials	7
Figure 1 — Apparatus for determination of deflection under load at 100 °C	3
Figure 2 — Power arc test: schematic test circuit	4
Figure 3 — Power arc test: contact assembly	5
Figure 4 — Power arc test: dimensions of test piece	6
Figure 5 — Power arc test: adjustment of frequency and damping: test circuit	7
Figure 6 — Power arc test: adjustment of frequency and damping: oscilloscope display	7
Figure 7 — Power arc test: adjustment of frequency and damping: oscilloscope display after damping	8
Table 1 — Exposure temperature and exposure period for determination of temperature index of cured materials	4
Publications referred to	Inside back cover

Foreword

This Part of BS 5734 has been prepared under the direction of the Plastics Standards Policy Committee and is a revision of BS 5734-1:1979, which is withdrawn.

This Part of BS 5734 is the first in a series for polyester moulding compounds: the other Parts are as follows:

- *Part 2: Specification for dough moulding compounds for electrical purposes;*
- *Part 3: Specification for dough moulding compounds for mechanical purposes;*
- *Part 4: Specification for sheet moulding compounds for electrical purposes;*
- *Part 5: Specification for sheet moulding compounds for mechanical purposes.*

BS 5734-1 describes test methods for thermosetting polyester moulding compounds to which reference is made in the other Parts. These are variously appropriate for uncured or cured materials or both, as follows:

- method 1: only for uncured material;
- method 2: for both cured and uncured material;
- methods 3 to 7: for cured material.

In this revision, method 5 has been replaced by one more attuned to modern technology and four new methods added which are aligned with International Organization for Standardization (ISO) methods.

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, pages i and ii, pages 1 to 8, 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.

1 Scope

This Part of BS 5734 describes the following methods of test for thermosetting polyester moulding compounds.

Method 1: Method for the determination of mass per unit area and mass distribution of uncured sheet compounds.

Method 2: Method for the determination of glass content of both cured and uncured materials.

Method 3: Method for the determination of deflection under load at 100 °C of cured materials.

Method 4: Method of test for oxygen index of cured materials.

Method 5: Method for the determination of temperature index of cured materials.

Method 6: Power arc test of cured materials.

Method 7: Inclined-plane tracking test of cured materials.

The following methods, which make reference to other British Standards, are also included.

Method 8: Flexural strength of cured materials.

Method 9: Flexural strength at elevated temperature of cured materials.

Method 10: Flexural modulus of cured materials.

Method 11: Impact strength of cured materials.

NOTE 1 Details for the preparation of test specimens are given in Parts 2 to 5 of this British Standard.

NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definition

oxygen index

the minimum concentration of oxygen, expressed as volume per cent, in a mixture of oxygen and nitrogen that will just support flaming combustion of a cured material initially at a temperature of 23 ± 2 °C under the conditions described in clause 6

3 Method 1: Method for the determination of mass per unit area and mass distribution of uncured sheet compounds

3.1 Sheet more than 830 mm wide

3.1.1 Apparatus

3.1.1.1 *Template*, or other suitable device.

3.1.1.2 *Knife*, or other suitable means of cutting test specimens.

3.1.2 Test specimens

Using a template or other suitable device, cut as many test specimens as possible, each 400 ± 2 mm $\times$ 250 ± 2 mm from the un moulded sheet with the longer side of the specimens parallel to the length direction of the roll. Take all the test specimens from a single strip across the roll. Take a minimum of three test specimens.

In any one set of test specimens, commence and finish cutting the roll not less than 40 mm inside the edges of the glass reinforcement. Where a row of test specimens is cut from the end of a roll do not cut within 40 mm of the transverse edge of the glass reinforcement.

3.1.3 Procedure

Weigh each test specimen to an accuracy of ± 1 g.

3.1.4 Expression of results

Express the mass per unit area (in g/m²) of each individual test specimen as follows.

$$\text{mass per unit area} = 10 \times M$$

where

M is the mass of the test specimen (in g).

Calculate the arithmetic mean of the results obtained for all the test specimens.

If the test specimens are weighed inclusive of protective films, deduct the mass of any such materials from the total mass of each individual test specimen before calculation.

3.2 Sheet less than 830 mm wide

3.2.1 Apparatus

The apparatus shall be as given in 3.1.1.

3.2.2 Test specimens

Prepare test specimens as described in 3.1.2 but with the width reduced by the minimum amount to permit three test specimens to be taken across the width of the sheet not within 40 mm of the edge of the glass reinforcement with the longer side of the specimens (400 mm) parallel to the length direction of the roll.

3.2.3 Procedure

Weigh each test specimen to an accuracy of ± 1 g.

3.2.4 Expression of results

Express the mass per unit area (in g/m²) of each individual test specimen as follows.

$$\text{mass per unit area} = \frac{2.5 \times M \times 1000}{b}$$

where

M is the mass of the test specimen (in g);

b is the width of the test specimen (in mm).