

Specification for

# Flexible polyurethane cellular materials for loadbearing applications

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# Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Plastics Industry Standards Policy Committee (PLM/-) and the Rubber Industry Standards Policy Committee (RUM/-) to Technical Committee PLM/RUM/8, upon which the following bodies were represented:

- British Fire Services' Association
- British Railways Board
- British Rubber Manufacturers' Association
- Department of the Environment (Building Research Establishment)
- Furniture Industry Research Association
- Malaysian Rubber Producers' Research Association
- Ministry of Defence
- National Bed Federation Ltd.
- Society of Motor Manufacturers and Traders Ltd.

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# Contents

|                                                                                                                                                  | Page               |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Committees responsible                                                                                                                           | Inside front cover |
| Foreword                                                                                                                                         | ii                 |
| 1 Scope                                                                                                                                          | 1                  |
| 2 Designation                                                                                                                                    | 1                  |
| 3 Structure and composition                                                                                                                      | 2                  |
| 4 Construction                                                                                                                                   | 2                  |
| 5 Surface condition                                                                                                                              | 2                  |
| 6 Component mass                                                                                                                                 | 2                  |
| 7 Dimensions                                                                                                                                     | 2                  |
| 8 Physical and chemical requirements                                                                                                             | 3                  |
| 9 Combustibility and ignitability                                                                                                                | 5                  |
| 10 Marking                                                                                                                                       | 5                  |
| Appendix A Schedule 1 to Statutory Instrument: 1988 No 1324, Consumer Protection. The Furniture and Furnishings (Fire) (Safety) Regulations 1988 | 8                  |
| Appendix B Typical applications for each class of material                                                                                       | 8                  |
| Appendix C Burning properties of flexible polyurethane cellular material and recommendations regarding its use                                   | 8                  |
| Figure 1 — Fatigue classes and indentation hardness index grades: low hardness values                                                            | 6                  |
| Figure 2 — Fatigue classes and indentation hardness index grades: high hardness values                                                           | 7                  |
| Table 1 — Classification of service type                                                                                                         | 1                  |
| Table 2 — Example of classification                                                                                                              | 1                  |
| Table 3 — Hardness grading                                                                                                                       | 2                  |
| Table 4 — Tolerances on length and width                                                                                                         | 3                  |
| Table 5 — Tolerance on thickness                                                                                                                 | 3                  |
| Table 6 — Property requirements for all types of materials                                                                                       | 4                  |
| Table 7 — Requirements for all types of materials except RE                                                                                      | 4                  |
| Table 8 — Property requirements for type RE materials                                                                                            | 4                  |
| Table 9 — Typical applications                                                                                                                   | 8                  |
| Table 10 — Recommended actions to minimize fire hazards                                                                                          | 10                 |
| Publications referred to                                                                                                                         | Inside back cover  |

## Foreword

This British Standard has been prepared under the direction of the Plastics Industry Standards Policy Committee and the Rubber Industry Standards Policy Committee. It is a revision of BS 3379:1975 which is not yet withdrawn as it is called up by the Furniture Regulations for defining the standard test foam for use in the flammability test for textiles.

NOTE BSI Sales Department will respond to purchase orders for BS 3379 by supplying copies of the 1991 edition. Copies of the 1975 edition may be obtained by quoting "BS 3379/75".

The main change incorporated in this revision is the addition of "combustion modified" materials since with effect from 1 March 1989 only these materials will be legally permitted for use in domestic upholstered furniture mattresses and bed bases. In this respect attention is drawn to the Government Furniture and Furnishings (Fire) (Safety) Regulations Statutory Instrument: 1988 No 1324, Consumer Protection The Furniture and Furnishings (Fire) (Safety) Regulations 1988 from which the test to identify combustion modified materials has been quoted as Appendix A.

Attention is also drawn to Statutory Instrument: 1989 No 2358, Consumer Protection The Furniture and Furnishings (Fire) (Safety) (Amendment) Regulations 1989.

No requirements are given for the colour of the material. Where a particular colour is required this should be agreed between the manufacturer and the purchaser.

It is intended to incorporate a test and requirements for compression set under humid conditions as soon as the necessary research in this field has been completed.

Recommended applications for the range of flexible polyurethane cellular materials specified in this standard are listed in Appendix B.

This British Standard is technically related to ISO 5999:1988 "Polymeric materials, cellular flexible — Polyurethane foam for load-bearing applications excluding carpet underlay — Specification" published by the International Organization for Standardization (ISO).

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 10, 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 British Standard specifies requirements for flexible loadbearing combustion modified, reduced ignitability, and unmodified polyurethane cellular materials, manufactured in block, sheet and strip form, in moulded and fabricated shapes and as reconstituted material.

This standard does not cover materials created in situ or those for use in heat-welded systems unless for loadbearing purposes.

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

## 2 Designation

### 2.1 Combustion grades

All materials shall be designated into one of two combustion grades, a combustion modified grade which shall be identified by use of the prefix, CM (see 9.1) and the remaining materials, i.e. those of reduced ignitability and unmodified materials for which no prefix is allocated (see 9.2).

NOTE At the discretion of the purchaser these latter two materials can be differentiated using BS 4735 as indicated in 9.2.

### 2.2 Type

For the purposes of this British Standard each grade shall also be divided into five types as follows:

|         |                         |
|---------|-------------------------|
| Type B  | Conventional slabstock  |
| Type HB | High-resilience block   |
| Type M  | Conventional moulded    |
| Type HM | High-resilience moulded |
| Type RE | Reconstituted           |

NOTE Most manufacturers will also supply the materials, if requested by the purchaser to include profiles or cavities.

### 2.3 Class

#### 2.3.1 Materials of types B, HB, M and HM.

Materials of types B, HB, M and HM shall be subdivided into five classes based on performance in the constant load pounding test described in method 13 of BS 4443-5. The five classes and their intended type of service are as given in Table 1.

**Table 1 — Classification of service type**

| Class | Type of service  |
|-------|------------------|
| X     | Extremely severe |
| V     | Very severe      |
| S     | Severe           |
| A     | Average          |
| L     | Light            |

The Classes X, V, S, A and L are defined by the maximum indentation hardness loss over the range of hardness index values from 0 to 650 N, as shown in Figure 1 and Figure 2. For example, a material with an initial indentation hardness index of 140 N would be classified as shown in Table 2.

**Table 2 — Example of classification**

| Range of indentation hardness loss | Class |
|------------------------------------|-------|
| N                                  |       |
| 0 to 17                            | X     |
| 18 to 31                           | V     |
| 31 to 44                           | S     |
| 45 to 55                           | A     |
| 56 to 63                           | L     |

Any material with an indentation hardness index of 140 N having a hardness loss greater than 63 N does not comply with the requirements of this standard.

**2.3.2 Reconstituted materials.** Reconstituted material (type RE), because of its good fatigue properties combined with poorer compression set, tensile strength and elongation at break properties, is specified separately in Table 8. It is generally used as thin, firm padding, or to provide reinforcement for the other materials.

### 2.4 Hardness grade

The materials shall be graded by the indentation hardness index (I), as determined by the method described in BS 4443-2, as given in Table 3. For moulded products, either the indentation hardness index (I) or the product hardness index (P) shall be used as specified by the purchaser.