
Specification for
Flexible urethane foam for
loadbearing applications

Gr 6
British Standards Institution

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The following BSI references relate to the work on this standard:
Committee reference PLC/RUC/8 Draft for comment 73/51290DC

Co-operating organizations

The Plastics and Rubber Industry Standards Committees, under whose supervision this British Standard was prepared, consist of representatives from the following Government departments and scientific and industrial organizations:

British Association of Synthetic Rubber Manufacturers	Electrical Research Association
*British Plastics Federation	Engineering Equipment Users' Association
British Resin Manufacturers' Association	*Malaysian Rubber Producers' Research Association
*British Rubber Manufacturers' Association Ltd.	*Ministry of Defence
*Chemical Industries Association Ltd.	Plastics Institute
Department of the Environment, Building Research Establishment	Post Office
Department of Trade and Industry	Royal Institute of British Architects
Department of Trade and Industry, Chemicals and Textiles	Royal Institute of Public Health and Hygiene
Electrical and Electronic Insulation Association	*Rubber and Plastics Research Association of Great Britain
Electrical Installation Equipment Manufacturers' Association	Rubber Growers' Association
	*Society of Motor Manufacturers and Traders Ltd.

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

Association of British Foam Laminators	Induction and Dielectric Heating Manufacturers' Association
British Fire Services Association	Leather and Coated Fabrics Manufacturers' Association
British Furniture Manufacturers' Federated Associations	London Transport Executive
British Railways Board	National Bedding Federation
Department of the Environment	
Furniture Industry Research Association	

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Amendments issued since publication

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Foreword

This British Standard, which is a revision of the 1961 edition, has been prepared under the authority of the Plastics Industry Standards Committee and the Rubber Industry Standards Committee.

The main changes incorporated in this revision are as follows.

- (a) This standard is now applicable to loadbearing applications in general. Instead of being limited, as previously, to vehicle components such as seating and cushioning, it now also relates to the quality of flexible urethane foam used in, for example, domestic furniture and bedding.
- (b) The classification is now based primarily on performance during a fatigue test rather than on the indentation hardness level. Indentation hardness is used as a secondary means of classifying materials.
- (c) Requirements have been introduced for two new types of material, i.e. 'cold cure' and reconstituted material.

Recommended applications for the range of flexible urethane foams specified in this standard are listed in appendix A.

This British Standard is being considered as a basis for international standardization by Technical Committee TC 45—Rubber and Rubber Products, of the International Organization for Standardization (ISO).

During 1973–4, after consultation with industry and commercial and government bodies, several discussions took place in the Executive Board of BSI as a result of concern about potential fire hazards involved in the rapidly increasing use of many polymeric materials, especially for furnishing and construction purposes. Issues of great public importance were involved, relating in particular to the use of laboratory fire tests to define quality requirements, in view of the general lack of correlation between the results obtained in such small-scale tests and the fire performance of materials and products in actual conditions of use.

The Executive Board decided that a detailed review of all the issues involved should be carried out as a matter of urgency, and that this should be comprehensive in scope rather than limited to polymeric materials. For this purpose an authoritative Co-ordinating Committee on Fire Tests was established. In the meantime certain general principles were laid down regarding the terminology and approach to be adopted in immediate revisions and amendments of the British Standards involving laboratory fire tests.

The present revision has been drafted in keeping with this policy. Further changes may be made at a later date as a result of the general review undertaken by the Co-ordinating Committee mentioned above.

Certification. Attention is drawn to the certification facilities described on the inside back cover of this standard.

British Standard Specification for

Flexible urethane foam for loadbearing applications

1. Scope

This British Standard specifies requirements for flexible loadbearing urethane foam. The foam is manufactured in block, sheet and strip form, in moulded and fabricated shapes, and as reconstituted material.

This standard does not cover urethane foam foamed in place or foam for use in heat-welded systems unless for loadbearing purposes.

2. References

The titles of the British Standards and the Draft for Development referred to in this standard are listed on the inside back cover.

3. Classification

3.1 Type. For the purposes of this British Standard, flexible urethane foam is divided into five types as follows:

Type B	Block or slabstock
Type CB	'Cold cure' high-resilience block
Type M	Conventional moulded
Type CM	'Cold cure' high-resilience moulded
Type RE	Reconstituted

3.2 Class

3.2.1 Materials of types B, CB, M and CM are subdivided into four classes based on performance in the constant load pounding test described in DD 31. The four classes and their intended type of service are as follows.

Class	Type of service
V	Very severe
S	Severe
A	Average
L	Light

The classes 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 figures 1 and 2. As an example, a material of initial indentation hardness index 140 N, with an indentation hardness loss between 0 and 38 N, is a class V material; with a hardness loss between 0 and 52 N is a class S material; with a hardness loss between 0 and 63 N is a class A material; and with a hardness loss between 0 and 71 N is a class L material. Any material of indentation hardness index of 140 N with a hardness loss greater than 71 N does not meet the requirements of this standard.

3.2.2 Reconstituted foam (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 5. It is generally used as thin, firm padding, or to provide reinforcement for the other foams.