BS EN ISO 5999:2013

BSI Standards Publication

Flexible cellular polymeric materials — Polyurethane foam for load-bearing applications excluding carpet underlay — Specification

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee PRI/24, Testing of rigid and flexible cellular materials.

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

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English Version

Flexible cellular polymeric materials - Polyurethane foam for load-bearing applications excluding carpet underlay - Specification (ISO 5999:2013)

Matériaux polymères alvéolaires souples - Mousse de polyuréthanne pour utilisations soumises à des charges, à l'exclusion des revers de tapis - Spécifications (ISO 5999:2013)

Weich-elastische Polymerschaumstoffe - Polyurethanschaumstoffe für Polsterzwecke mit Ausnahme von Teppichunterlagen - Anforderungen (ISO 5999:2013)

This European Standard was approved by CEN on 26 July 2013.

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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN ISO 5999:2013) has been prepared by Technical Committee ISO/TC 45 “Rubber and rubber products” in collaboration with Technical Committee CEN/TC 249 “Plastics” the secretariat of which is held by NBN.

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of an identical text or by endorsement, at the latest by March 2014, and conflicting national standards shall be withdrawn at the latest by March 2014.

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Endorsement notice

The text of ISO 5999:2013 has been approved by CEN as EN ISO 5999:2013 without any modification.

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 4, *Products (other than hoses)*.

This third edition cancels and replaces the second edition (ISO 5999:2007), which has been technically revised.

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INTERNATIONAL STANDARD ISO 5999:2013(E)

Flexible cellular polymeric materials — Polyurethane foam for load-bearing applications excluding carpet underlay — Specification

1 Scope

This International Standard specifies requirements for flexible load-bearing polyurethane foam of the polyether type.

It is applicable to flexible polyurethane cellular materials manufactured in block, sheet and strip form, in moulded and fabricated shapes, and as reconstituted material, used for load-bearing applications in general, but excluding carpet backing and underlay. It, thus, primarily relates to the quality of polyurethane foam used for comfort cushioning purposes.

The foam is classified according to the type of foam, the performance during a fatigue test, and the indentation hardness index used as a means of grading materials.

This International Standard is not applicable to polyurethane foams foamed in place or to foams for use in heat-welded systems unless for load-bearing purposes.

Recommended applications for the range of flexible polyurethane foams covered by this International Standard are listed in Annex A.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 845, *Cellular plastics and rubbers — Determination of apparent density*

ISO 1798, *Flexible cellular polymeric materials — Determination of tensile strength and elongation at break*

ISO 1856, *Flexible cellular polymeric materials — Determination of compression set*

ISO 1923, *Cellular plastics and rubbers — Determination of linear dimensions*

ISO 2439:2008, *Flexible cellular polymeric materials — Determination of hardness (indentation technique)*

ISO 2440, *Flexible and rigid cellular polymeric materials — Accelerated ageing tests*

ISO 3385, *Flexible cellular polymeric materials — Determination of fatigue by constant-load pounding*

ISO 3582, *Flexible cellular polymeric materials — Laboratory assessment of horizontal burning characteristics of small specimens subjected to a small flame*

ISO 3795, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 8307, *Flexible cellular polymeric materials — Determination of resilience by ball rebound*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

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3 Classification

3.1 Type

For the purposes of this International Standard, flexible polyurethane foams are classified in accordance with Table 1.

Table 1 — Types of foam

Type		Description of foam
I	LB	Block foam, slabstock or contour cut [low resilience (known as "viscoelastic")]
	MB	Block foam, slabstock or contour cut (conventional)
	HB	Block foam, slabstock or contour cut (high resilience)
II	LM	Moulded [low resilience (known as "viscoelastic")]
	MM	Moulded (conventional)
	HM	Moulded (high resilience)
III	RE	Reconstituted or bonded

3.2 Class

3.2.1 Materials of the types of foam listed in Table 1, except for type MM (see footnote b to Table 7) and RE (see footnote a to Table 8), are subdivided into five classes based on the performance in the constant-load pounding test described in ISO 3385.

3.2.2 The five classes, their intended types of service and their intended hardness loss ratio are given in Table 2.

Table 2 — Classes and intended types of service

Class	Type of service	Hardness loss ratio P (%)
X	Exceptionally severe	$0 \leq P < 12$
V	Very severe	$12 \leq P < 22$
S	Severe	$22 \leq P < 32$
A	Average	$32 \leq P < 39$
L	Light	$39 \leq P < 45$

NOTE The hardness loss ratio is calculated from the following formula:

$$P = \frac{H - F}{H} \times 100$$

where

P is the hardness loss ratio (%);

H is the initial hardness index (N);

F is the final hardness index (N).

3.2.3 Classes X, V, S, A and L are defined by the indentation hardness loss over the range of hardness index values from 0 N to 650 N, as shown in Figures 1 and 2, provided the requirements for physical properties specified in Table 6, Table 7 and Table 8 are met.

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