BS 5808 : 1991

Specification for

Underlays for textile floor coverings

BSI
STANDARDS

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Textiles and Clothing Standards Policy Committee (TCM/-) to Technical Committee TCM/3, upon which the following bodies were represented:

Association of Consulting Scientists
British Carpet Manufacturers' Association Ltd.
British Polyolefin Textiles Association
British Retailers' Association
British Shops and Stores Association (BSSA)
British Textile Technology Group
Carpet Cleaners' Association
Confederation of British Wool Textiles Limited
Consumer Policy Committee of BSI
Contract Flooring Association
Fibre Bonded Carpet Manufacturers' Association
Institute of Trading Standards Administration
International Wool Secretariat
Man-made Fibres Producers' Committee
Power Loom Carpet Weavers' and Textile Workers' Association
Royal Institute of British Architects
South Western Regional Health Authority
Wholesale Floorcovering Distributors' Association

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

British Rubber Manufacturers' Association
Needleloom Felt Manufacturers' Association

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The following BSI reference relates to the work on this standard:
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Contents

Foreword

This British Standard has been prepared under the direction of the Textiles and Clothing Standards Policy Committee. It is a revision of BS 5808 : 1979 which is withdrawn.

In this revision, the factors which affect the use of an underlay in a given application have been rationalized. An attempt has been made to accommodate the technological requirements of underlays suitable for different end uses with the practical experience of underlay manufacturers, resulting in a system for classifying underlays by work of compression after dynamic loading and compression after dynamic loading.

Flammability requirements have not been included. Methods for assessing the ignitability of materials such as a textile floor covering are under development, but their application to underlays has not been determined. However, some work has shown that the contribution of an underlay to the ignitability of a textile floor covering is likely to be small.

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

Specification

1 Scope

This British Standard specifies performance requirements for fibrous, non-fibrous and combined underlays, together with their classification for five categories of intended use/application.

NOTE 1. Advice on the installation of textile floor coverings, etc. is given in BS 5325.

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

2 Definitions

For the purposes of this British Standard, the following definitions apply.

2.1 Fibrous underlay

2.1.1 needlefelt underlay

An underlay made wholly of fibres entangled or matted together by needling of a fibre batt.

2.1.2 impregnated fibrous underlay

An underlay made of fibrous material consolidated by impregnation with a binding agent.

NOTE. A woven, nonwoven or film scrim may be included in a fibrous underlay for support during manufacture.

2.2 Non-fibrous underlay

2.2.1 cellular rubber underlay

An underlay formed essentially of a vulcanized rubber foam, with or without a carrier or backing material bonded thereto.

2.2.2 cellular plastics (polymeric) underlay

An underlay formed essentially of a polymeric foam, e.g. polyurethane, with or without a carrier or backing material bonded thereto.

2.2.3 rubber crumb underlay

An underlay formed essentially of crumb vulcanized rubber with or without a carrier or backing material bonded thereto.

2.3 combined underlay

An underlay composed of two or more layers of any fibrous underlay combined with two or more layers of any non-fibrous underlay.

3 Sampling

Sampling shall be carried out in accordance with BS 4664. A full width sample 1 m in length in the machine production direction shall be taken. For non-fibrous underlays, a minimum period of 3 days shall be allowed between manufacture and sampling.

4 Performance

All underlays shall comply with the performance requirements given in table 1, when tested in accordance with the methods given therein.

Table 1. Performance requirements for underlays

Property	Performance requirement	Test method
Breaking strength	40 N min.	BS 2576[1]
Elongation	10 % max. extension for applied force of 40 N	
Loss in thickness:		
(a) static loading: recovery period 24 h	Fibrous underlay 40 % max.	BS 4939
	Non-fibrous underlay 15 % max.	
	Combined underlay 40 % max.	
(b) dynamic loading: after 1000 cycles	Fibrous underlay 40 % max.	BS 4052
	Non-fibrous underlay 15 % max.	
	Combined underlay 20 % max.	
Thickness deviation:		BS 4051[2]
(a) mean original thickness from the nominal thickness	Fibrous and combined underlay 15 % max.	
	Non-fibrous underlay 12 % max.	
(b) difference between maximum and minimum original thicknesses	Fibrous and combined underlay 4 mm max.	
	Non-fibrous underlay 3 mm max.	
Compression after dynamic loading	2 mm min., 7 mm max.	BS 4052[3] and
Work of compression after dynamic loading	50 J/m^2 min., 200 J/m^2 max.	BS 4098
Retention of original work of compression	40 % min.	
Resistance to breaking or cracking	No cracks longer than 50 mm	Appendix A
	No cracks in any backing material	

[1] The requirement in BS 2576 to include at least 20 threads in the test specimum need not be met.
[2] Thickness is measured in accordance with BS 4051 at 10 equally spaced intervals across the full width of an underlay using a presser foot of area between 700 mm^2 and 1000 mm^2.
[3] Compression and work of compression are determined in accordance with BS 4098 except that a presser foot of between 700 mm^2 and 1000 mm^2 is used and loading of the specimen is only up to 100 kPa. Compression and work of compression are calculated between 2 kPa and 100 kPa (see appendix B) before and after dynamic loading for 1000 cycles in accordance with BS 4052. Certain carpet thickness gauges may require modification and the manufacturer's advice should be sought.

5 Classification

All underlays shall be classified as suitable for different intended use/applications in accordance with the performance levels shown in figure 1 for work of compression after dynamic loading versus compression after dynamic loading.

NOTE 1. The designations and the descriptions of intended use/application are described in table 2.

NOTE 2. Underlays should initially be specified to the appropriate classification for that particular application. An underlay classified L/U as being suitable for luxury use may be used in a heavy contract situation where extra comfort is required, such as in prestigious areas, but when looking at the alternative uses for any of the classes of underlays, advice should be sought from the manufacturer/supplier.

Table 2. Designation and description of intended use/application

Designation	Description of intended use/application
LD/U	Light domestic use, not suitable for stairs
GD/U	General domestic use
L/U	Luxury use, domestic/contract, where high energy absorption is desirable
GC/U	General contract use, suitable for normal foot and wheel traffic
HC/U	Heavy contract use, suitable for heavy foot and wheel traffic and castor chairs

6 Marking

Underlays shall be provided with a label or other means giving at least the following information:

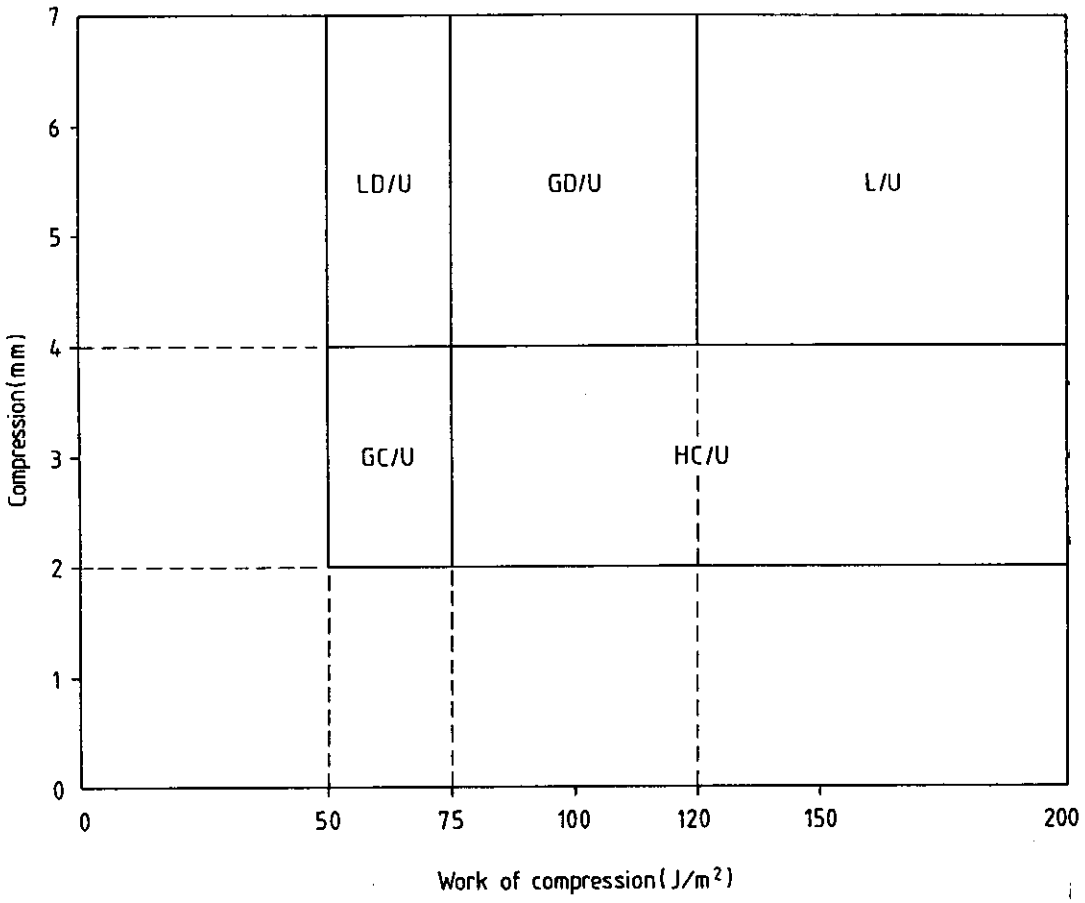
(a) the number and date of this British Standard, i.e. BS 5808 : 1991[1)];

(b) the manufacturer's or supplier's identification or trade mark;

(c) a description of the underlay, i.e. fibrous underlay, non-fibrous underlay or combined underlay, as appropriate;

(d) the classification in accordance with clause 5, e.g. LD/U.

[1)] Marking BS 5808 : 1991 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.



NOTE. For a description of each designation, see table 2.

Figure 1. Classification of underlays (work of compression after dynamic loading versus compression after dynamic loading, in accordance with BS 4098)

Appendices

Appendix A. Method for determination of resistance to breaking and cracking

NOTE. The test is applicable to all types of underlay except those of wholly fibrous construction.

A.1 Principle

A rectangular piece of underlay is folded at each end. One end is placed under a weight-piece, whilst the other is folded without an added weight. After 1 h, the weight-piece is removed and each fold of the test specimen is visually assessed for signs of cracking.

A.2 Apparatus

A.2.1 *Rectangular rigid metal plate*, of minimum dimensions 80 mm × 40 mm.

A.2.2 *Weight-piece*, such that the combined mass of the metal plate (**A.2.1**) and the weight piece is 2.5 kg.

A.2.3 *Single-sided adhesive carpet tape*, 50 mm wide.

A.3 Test specimen

The test specimen shall be of minimum dimensions 240 mm × 120 mm.

A.4 Procedure

A.4.1 Fold the test specimen as shown in figure 2, so that when folded the edges of the test specimen meet and the backing material, if any, is innermost.

A.4.2 Tape (**A.2.3**) the edges of the test specimen together and then turn the test specimen over so that the edges where the folds meet are on the underside.

A.4.3 Place the metal plate (**A.2.1**) on the folded test specimen as shown in figure 3.

A.4.4 Place the weight-piece (**A.2.2**) on top of the metal plate and leave for 1 h.

A.4.5 Remove the weight-piece and metal plate and immediately examine the folded specimen for signs of cracking and breaking.

A.5 Test report

Report the number of cracks or breaks and their length and location relative to the position of the metal plate during loading.

Appendix B. Calculation of work of compression

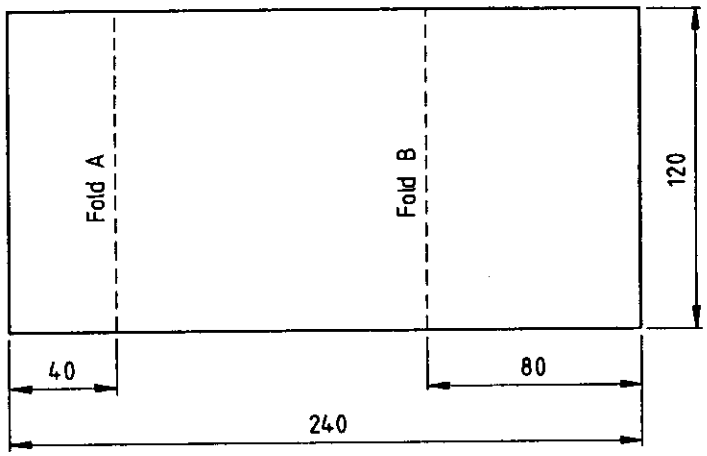
Work of compression may be calculated either directly by integration of the area under the loading curve between 2 kPa and 100 kPa by computer programme or by estimation of the area from discrete thickness measurements. If the second method is used, take thickness measurements at 2 kPa, 5 kPa, 10 kPa, 20 kPa, 50 kPa and 100 kPa pressure and calculate the work of compression (in J/m^2) using the following expression:

$$W_c = (1.5\ t_2 + 4\ t_5 + 7.5 t_{10} + 20\ t_{20} + + 40\ t_{50} - 73\ t_{100})$$

where

t_2 is the thickness (in mm) at 2.0 kPa pressure;

t_5 is the thickness (in mm) at 5.0 kPa pressure, etc.



All dimensions are in millimetres.

Figure 2. Arrangements of folds in test specimen for resistance to breaking and cracking test

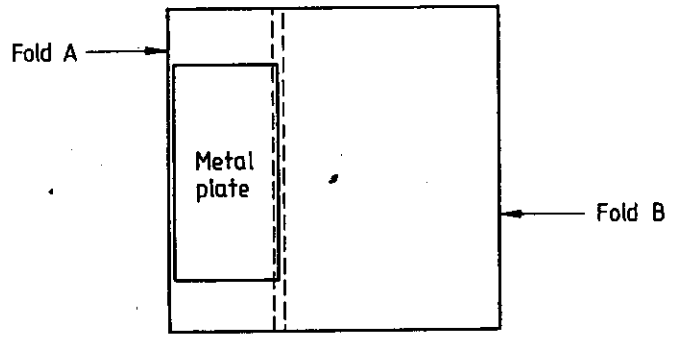


Figure 3. Location of metal plate on folded test specimen for resistance to breaking and cracking test