

Specification for Pressed wool felts

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The preparation of this British Standard was entrusted by the Textiles and Clothing Standards Policy Committee (TCM/-) to Technical Committee TCM/20, upon which the following bodies were represented:

- Association of Jute Spinners and Manufacturers
- Flax and Linen Association (GB)
- Made-up Textiles Association
- Man-made Fibres Producers' Committee
- Textile Research Council

The following bodies were also represented in the drafting of the standard through sub-committees and panels

- British Railways Board
- Ministry of Defence
- Pressed Felt Manufacturers' Association

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Foreword

This British Standard has been prepared under the direction of the Textiles and Clothing Standards Policy Committee and supersedes BS 4060:1972 which is withdrawn.

In this revision the principal changes from the previous edition are:

- a) reclassification of pressed wool felts into two types, i.e. general purpose felts (used for packaging, clothing, decorative and similar purposes) and precision felts (used in engineering applications where close tolerances are necessary); and
- b) redesignation of the felts by a condensed technical description which serves to indicate the type of pressed wool felt, the nominal wool content, the hardness grade and the colour.

Information to be provided by the purchaser is given in Appendix A. Appendix B contains cross-reference information between the designations used in this edition of BS 4060 and those used in the 1972 edition. In preparing this revision, account has been taken of Parts 1, 2 and 3 of Ministry of Defence Standard 83-19, "Cloths, compressed felts, wool and blended wool". Supplementary information for MoD contracts is given in Appendix C.

BS 1133-11:1968 included a description of packaging felts giving methods of proofing and specifying chemical requirements together with methods of test. In view of these details being a duplication of the requirements given in BS 4060, BS 1133-11 has been withdrawn.

Contract requirements

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.

Attention is drawn to the need, if appropriate, for the fibre content to be given in accordance with Statutory Instrument 1986 No. 26 Trade Descriptions. The Textile Products (Indications of Fibre Content) Regulations 1986 and Statutory Instrument 1988 No. 1350 The Textile Products (Indications of Fibre Content) Regulations 1988.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 16, 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 the following two types of pressed wool felt:

- a) general purpose felts including packaging felts, and decorative felts;
- b) precision felts.

Methods of test for chemical and physical properties are given in Appendix D and Appendix E respectively.

NOTE 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 felt

a fabric characterized by the entangled condition of most, or all, of the fibres of which it is composed

2.2 general purpose felts

felts used for packaging, clothing, decorative and similar purposes

2.3 precision felts

felts used in engineering applications, where close tolerances are necessary

2.4 pressed felt

a felt formed from a web or batt containing animal hair or wool, consolidated by the application of heat and mechanical action that causes the constituent fibres to mat together

2.5 white felt

felt which has the colour of natural unpigmented wool

NOTE White felts are used where the visual appearance is important.

2.6 grey felt

felt, the colour of which has been obtained from using mixtures of coloured wools and other fibres

3 Materials

Felts shall be manufactured from wool, or mixtures of wool with natural or man-made fibres. The minimum wool content shall be as specified in Table 1 and Table 4.

NOTE 1 Felts complying with this standard may be white or grey, with a minimum wool content of 75 %, 90 % or 97 %, except for A97/7D felt, which is dyed (see Table 1).

NOTE 2 The fibres should be blended, carded and felted to form a uniform product substantially free from permanent ridges and creases. The product should be free from all non-fibrous agents, e.g. stiffening, loading or reinforcing agents of any kind.

4 Designation

Felts shall be designated by a condensed technical description (see Table 1 and Table 4) containing the following:

- a) a first letter to indicate whether the felt is general purpose (A) or precision (B);
- b) a number, consisting of two digits, to indicate the minimum percentage wool content;
- c) an oblique stroke;
- d) a single digit number, 1 to 8, to indicate the hardness or density grade;
- e) a letter to indicate the colour white (W), grey (G) or dyed (D);

NOTE If appropriate, interested parties may agree to include the additional designations in Table 6 and Table 7 to indicate that particular chemical and/or physical requirements have been complied with (see 5.4 and 5.5);

Examples

A75/1W indicates the felt to be general purpose, with 75 % wool content, extra hard and white.

B97/1G6.1-6.6 indicates the felt to be a precision felt with 97 % wool content, extra hard, grey, having a minimum breaking strength of 5.5 MPa and having chemical properties conforming with 6.1 to 6.6 of Table 6.

5 Performance

5.1 General purpose felts

General purpose felts, including packaging felts, shall comply with Table 1 and Table 2.

NOTE Commonly manufactured thicknesses are 1, 3, 5, 10, 15, 20 and 25 mm but other thicknesses may be specified by the customer.

5.2 Decorative felts

Decorative felts shall comply with 5.1 and shall, additionally, meet the minimum colour fastness ratings detailed in Table 3 (see also C.3.3).

5.3 Precision felts

Precision felts shall comply with Table 4 and Table 5.

5.4 Chemical properties

If felts are required to have particular chemical properties, the felts shall comply with the relevant requirements of Table 6.

NOTE 1 The purchaser should specify whether any particular chemical properties are required (see Appendix A).

NOTE 2 For MoD purposes, general purpose felts and felts for aerospace purposes should comply with 5.1, 5.3 and Table 6.

5.5 Physical properties

If felts are required to have particular physical properties, such as breaking strength and oil retention, the felts shall comply with the relevant requirements of Table 7.

NOTE The purchaser should specify whether any particular physical properties are required (see Appendix A).

5.6 Special finishes

Felts shall be manufactured either with or without special finishes imparting, for example, rot, mildew, moth, flame or water resistance, or a combination of these properties.

NOTE 1 The purchaser should specify whether any special finishes are required (see Appendix A).

NOTE 2 For aerospace purposes, felts should be rot-proofed (see 3.7 of Table 6) in accordance with PCPL (normal process) of BS 2087-1.

6 Inspection, sampling, conditioning and testing atmosphere

6.1 Inspection

Each manufactured piece shall be visually inspected for defects, e.g. permanent ridges and/or creases and holes.

NOTE 1 Interested parties may agree to the nature and number of defects which may be permitted, on the marking of their positions in the roll or sheet and on the appropriate allowance to be made.

NOTE 2 Felts for MoD purposes should be substantially free from holes.

6.2 Sampling

6.2.1 Unless otherwise specified in the relevant test method, samples of the felt shall be taken from each lot of 200 m² or less.

6.2.2 Samples shall be taken at least either 1 m from either end of a roll or 10 cm from either end of a sheet.

6.2.3 Each sample shall consist of a strip or strips cut from across the full width of the felt to give a total mass sufficient to perform all tests required and of adequate dimensions appropriate to the tests to be performed.

For chemical tests cut the sample into cubes having sides no more than 5 mm long. Condition the cubes for 24 h in accordance with 6.3, Mix the cubes together and randomly select a number of them to give a test specimen of mass appropriate to the test method under consideration.

6.3 Conditioning and testing atmosphere

Unless otherwise specified in the relevant test method, conditioning and testing shall be carried out in the standard temperate atmosphere specified in BS 1051, i.e. a relative humidity of $65 \pm 2\%$ and a temperature of $20 \pm 2^\circ\text{C}$.

Laboratory samples shall be conditioned by exposing them for at least 24 h in the conditioning atmosphere.

7 Marking

Pressed wool felts shall be marked with the following particulars:

- a) the name, trade mark or other means of identification of the manufacturer;
- b) the number and date of this British Standard, i.e. BS 4060:1989¹⁾;
- c) the felt type and designation in accordance with clause 4;
- d) the nominal width, length and thickness of the piece or sheet.

¹⁾ Marking BS 4060:1989 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.

Table 1 — General purpose felts

	Designation			Colour	Hardness		Nominal density
	Minimum wool content				Grade	Description	
	75 %	90 %	97 %				
	A75/1W A75/1G	— —	A97/1W A97/1G	White Grey	1	Extra hard	^{mg/mm³} 0.60
	A75/2W A75/2G	— —	A97/2W A97/2G	White Grey	2	Hard	0.46
	A75/3W A75/3G	— —	A97/3W A97/3G	White Grey	3	Extra firm	0.40
	A75/4W A75/4G	— A90/4G	A97/4W A97/4G	White Grey	4	Firm	0.34
	A75/5W A75/5G	— —	A97/5W A97/5G	White Grey	5	Medium firm	0.27
	A75/6W A75/6G	— —	A97/6W A97/6G	White Grey	6	Medium	0.23
	—	—	A97/7D	Dyed	7	Medium soft	0.20
	A75/8W A75/8G	A90/8W A90/8G	A97/8W A97/8G	White Grey	8	Soft	0.18
	A75/9W A75/9G	— —	A97/9W A97/9G	White Grey	9	Extra soft	0.15
Test method	D.1			—	—	—	E.2

Table 2 — Tolerances on general purpose felts

	Nominal thickness	Tolerance on nominal thickness and density	Tolerance of individual thickness measurements
	mm	%	%
	3.0 and below	± 20 ^a	± 25
	3.1 to 10	± 15	± 20
	above 10	± 10	± 15
Test method	E.1	—	—
^a See note to E.2.3.			