BSI

BS 6453 : 1984

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British Standard Specification for

Performance of leathers for garments

Cuirs pour habillement — Spécifications

Leder für Bekleidung

British Standards Institution

Contents

	Page
Foreword	Inside front cover
Committees responsible	Back cover
Specification	1
1. Scope	1
2. Definitions	1
3. Performance	1
4. Sampling	1
5. Marking	
Appendices	
A. Method for measurement of adhesion of finish to leather	3
B. Method for determination of the cold crack temperature	6

	Page
Tables	
1. Performance requirements for all garment leathers	2
2. Additional performance requirements for grain garment leathers	2
Figures	
1. Leather finish adhesion tester	4
2. Position of test specimens on leather sample	5
3. Arrangement of metal plates on test specimens	5
4. Bonding of metal plates to leather test specimens	5
5. Prepared test specimen in test position	6
6. Refrigerated cabinet	7
7. Hinged apparatus	7
8. Open position	7
9. Closed position	7

Foreword

This British Standard has been prepared under the direction of the Textile Products and Leather Standards Committee at the request of leather manufacturers.

It specifies performance requirements for suede leathers, grain leathers and wool sheepskins, which are to be made into garments, in order to achieve a satisfactory end product for the consumer.

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

British Standard Specification for

Performance of leathers for garments

1. Scope

This British Standard specifies performance requirements for leathers to be used in the manufacture of garments. It is applicable to suede leather, grain leathers (including simulated grain leathers) and wool sheepskins but excludes furs.

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 definitions given in BS 2780 apply, together with the following.

cold crack temperature. The highest temperature at which the finish of a leather will crack when the leather is folded quickly once, grain outwards.

3. Performance

Leathers shall meet the requirements given in table 1 and table 2, as appropriate, when tested by the methods specified. For wool sheepskins, both surfaces shall comply with the requirements.

NOTE. Table 1 is applicable to all leathers, table 2 gives additional requirements for grain leathers.

4. Sampling

Samples shall be taken for testing in accordance with method 1 of BS 3144.

5. Marking

Each unit pack containing leathers shall be marked with the following:

(a) the number and date of this British Standard, i.e. BS 6453 : 1984*;

(b) the supplier's and/or tanner's name and identification mark, trademark or batch identity;

(c) cleansing instructions in accordance with the recommendations and terminology of BS 2747.

NOTE 1. It is recommended that made-up garments should be marked either:

(a) 'Made only from leather which complies with BS 6453 : 1984*';

or (in the case of trims)

(b) 'Contains only leather which complies with BS 6453 : 1984*'.

NOTE 2. The term wool sheepskin may be used instead of leather where appropriate.

*Marking BS 6453 : 1984 on or in relation to a product is a claim by the manufacturer that the product has been manufactured to the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, Quality Assurance Division, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ in the case of certification marks administered by BSI or to the appropriate authority for other certification marks.

Table 1. Performance requirements for all garment leathers

Property to be assessed	Test procedure	Compliance requirements
Tear strength	BS 3144 (method 6)	An average of not less than 17 N with no single specimen having a tear strength of less than 13 N when tested in the official sampling position
Dimensional stability to dry cleaning	BS 4961 : Part 1*	Maximum area shrinkage 6 % Maximum area extension 3 %†
Colour fastness to light	BS 1006, section B02 (method 2)	Minimum 3-4
Colour fastness to dry cleaning	BS 1006, section D01	Maximum change in shade 3
Colour fastness of surface to rubbing	BS 1006, section UK-LG	Maximum change in shade 3 after 50 cycles (wet) and 200 cycles (dry)
Colour fastness to perspiration	BS 1006, section UK-LF‡	Maximum change in shade 3 Maximum staining 3
Colour fastness to water	BS 1006, section UK-LD	Maximum change in shade 3 Maximum staining 3

*Modify the procedure given in BS 4961 : Part 1 so that airing off is limited to 30 min in the machine with the effluent air temperature at a maximum of 60 °C.

†The dimensional changes allowed do not imply that garments in wear will have this tolerance after dry cleaning. Experiments have shown that leathers giving this degree of area change in the test when processed as garments by normal commercial procedures with reoiling can be restored to their original dimensions.

‡Adjust the artificial perspiration solution to pH 5.0.

Table 2. Additional performance requirements for grain or simulated grain garment leathers

Property to be assessed	Test procedure	Compliance requirements
Fastness of finish to dry cleaning	BS 1006, section D01	No significant change in appearance§
Adhesion of finish to leather	Appendix A of this standard	Dry, 2 N/10 mm minimum Wet, 1 N/10 mm minimum
Cold crack temperature	Appendix B of this standard	−5 °C maximum

§This requirement has been included to ensure that grain leathers which are in accordance with the colour fastness to dry cleaning requirement specified in table 1 do not comply with the standard if the dry cleaning procedure results in partial or complete loss of finish.

Appendix A

Method for measurement of adhesion of finish to leather

A.1 Principle. One end of a piece of leather under test is stuck, finish side down, to a metal strip, by a selected adhesive, chosen to give an adequate bond between the finish and the metal without affecting the adhesion of the finish to the leather. When the adhesive is fully set or cured, increasing force is applied to the loose end of the leather until the finish peels away from the leather. The load required to peel the finish is recorded.

A.2 Apparatus and reagents

A.2.1 *Metal plates*, measuring 10 ± 0.5 mm wide and approximately 75 mm long and 3 to 3.5 mm thick. One plate is required for each pair of leather test specimens.

A.2.2 *Metal square*, with sides 65 mm long and a mass of 150 g, covered on one side with a soft rubber sheet 2 mm thick.

A.2.3 *Clamp and stand*, to hold the metal strip and test specimens and strong enough to support loads of up to 2 kg.

A.2.4 *Means of applying small successive additions of load*, without shock, to a holder attached to the loose end of the leather. For example, weights of 25 g or 50 g can be placed on a simple scale pan of known mass (preferably 50 g) attached to the leather by means of a hook. A suitable apparatus of this type is shown in figure 1.*

A.2.5 *Adhesive.* Different adhesives give different results on the same leather. For most leather finishes, an epoxy resin adhesive with a pot life of about 1 h at 20 °C, mixed with an equal part by mass of a curing agent and having a cure time of 48 h, has been found suitable.

A.2.6 *Pure light petroleum ether*, boiling point range 60 °C to 80 °C.

A.3 Test specimens. Cut a sample of leather measuring 130 mm in length by 70 mm in width from the official sampling position described in clause **1** of BS 3144 : 1968, or from another agreed position. Cut one piece for dry tests and another piece for wet tests. Figure 2 shows the sample of leather taken for testing and the shaded areas show the actual area of test specimens required.

NOTE. The adhesion across a skin or side varies appreciably in some cases and for interlaboratory comparisons it is desirable to allocate the test specimens in such a way that adjacent specimens are sent to each laboratory rather than adjacent sample blocks.

A.4 Preparation of test specimens

A.4.1 Scour the metal plates with 'A' weight grade P400 abrasive paper in accordance with BS 871 so that the surface is clean and flat with a fine matt finish. Immerse them in petroleum ether for a few seconds to remove grease and wipe with a piece of grease-free cotton wool (medical quality) to remove all dirt.

A.4.2 Cut the leather into two pieces for three test specimens 'along' and three 'across' (see figure 2). Turn the 'across' sample through a right-angle and place it against the 'along' sample. Soak a piece of grease-free cotton wool (medical quality) in petroleum ether and then wring it almost dry. Wipe this gently over the grain surface of the leather test specimens and the surfaces of the metal plates being careful not to contaminate the cleaned surfaces, for example with grease from the fingers.

A.4.3 When the petroleum ether has evaporated, smear the adhesive lightly over the cleaned surface of the metal plates and the area of leather to be tested, applying the thinnest possible continuous film of adhesive.

NOTE. A glass or nylon scraper is a suitable tool.

A.4.4 Place three metal plates, adhesive side down, on to the two pieces of leather as shown in figure 3. Press the plates firmly down and ensure that sufficient adhesive has been used by noting slight exudation at the edges of the plates. It is important that there should be no more than 3 min between coating of the metal strip with adhesive and combination with the leather to prevent exposure to moisture and dust.

A.4.5 Place the metal square on the metal plates (see figure 4). Place a weight having a mass of approximately 1350 g centrally on the metal square, so that the total load of approximately 1500 g (500 g per plate) is applied evenly to all of the adhesive bonds.

NOTE. **A.4.2, A.4.4** and **A.4.5** describe the use of one piece of leather to provide six test specimens. If separate test specimens are used these should be at least 50 mm long and 13 mm wide, but the method is essentially the same.

A.4.6 When the joints are fully set or cured, remove the weight and metal square, trim the leather test specimens to the width of the metal plate by cutting along the edges of the plate with a pair of sharp scissors or a scalpel. To avoid edge effects make sure that no adhesive is left on the edges of the metal plate. Gently sever the bond between the short edge of the metal plate and each test specimen, i.e. at 'A' in figure 5, separating leather and metal for about 1.5 mm.

A.4.7 Punch a small hole of sufficient diameter to accommodate an S-hook in the free end of the test specimens and about 5 mm from the end.

A.5 Procedure

A.5.1 *Adhesion of finish under dry conditions*

A.5.1.1 Place the metal plate horizontally in the stand over the supporting rod so that the affixed leather is on the underside (see figure 5). Insert an S-hook in the hole in the end of the leather strip to be tested and attach the scale pan of known mass to the hook. Depress the lever at the base of the stand slowly to allow the mass of the pan to pull on the leather strip. This represents the first test equal to 50 g (mass of the pan assembly).

A.5.1.2 Release the lever slowly until the pan rests on its platform. Carefully add successive additional weights centrally to prevent swinging, freeing the pan for each addition by means of the lever, until the leather shows signs of beginning to peel away from the metal plate. Up to this stage the weights may be added as quickly as is convenient. Continue adding weights at 10 s intervals until separation has occurred over at least two thirds of the area of the bond. Use 25 g increments until the total load reaches 400 g and thereafter use 50 g increments.

A.5.1.3 When separation has occurred, add together the total mass of the weights on the pan and the mass of the scale pan. Calculate from this the force (in N/10 mm) and express the result as the adhesion of the finish.

*For information on the availability of such apparatus apply to Enquiry Section (London), British Standards Institution, quoting the number of this standard and enclosing a stamped addressed envelope for reply.

A.5.1.4 Note the type of separation which occurred and describe it as one of the following:

(a) normal peeling, i.e. for a length not less than 10 mm and covering 90 % of the width of the test specimen;

(b) plate to adhesive failure;

(c) adhesive to finish failure;

(d) finish coats separating;

(e) adhesion of finish failing in patches;

(f) leather torn (grain coming away or tearing into corium).

If adhesion failure (b) or (c), indicating an unsatisfactory adhesive or poor preparation of test specimens, occurred, repeat the entire procedure using a different adhesive or a new sample of leather.

A.5.2 *Adhesion of finish under wet conditions*

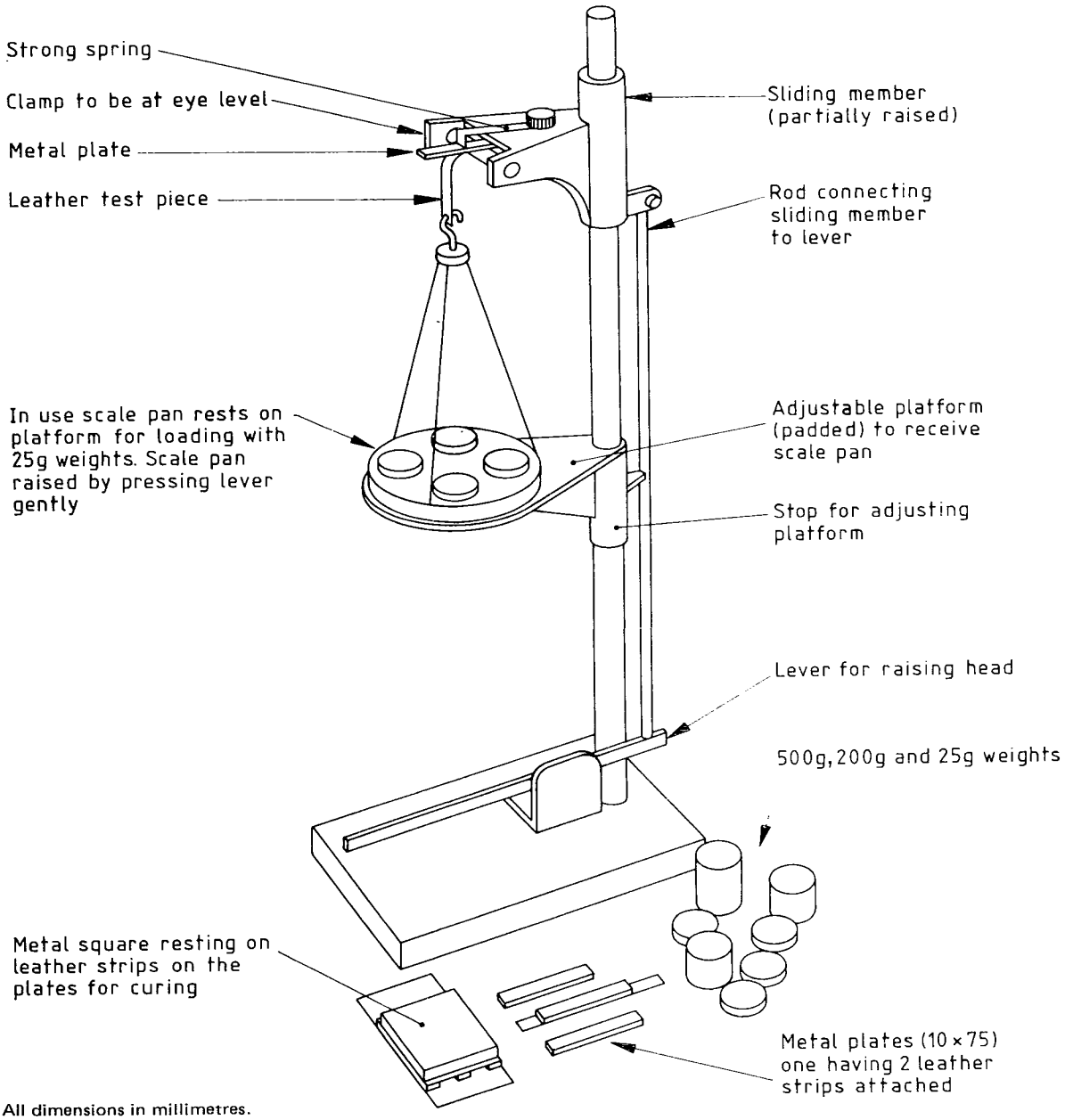
A.5.2.1 After preparation and trimming (see **A.4**), immerse the metal plates and attached leather strips in distilled water for 20 min, rubbing the flesh side with the finger to facilitate penetration. Remove the plate and blot off excess moisture from the metal and leather. Allow to stand in air for 10 min in the laboratory.

A.5.2.2 Proceed as in **A.5.1.1** to **A.5.1.4**.

A.6 Test report. The test report shall state either:

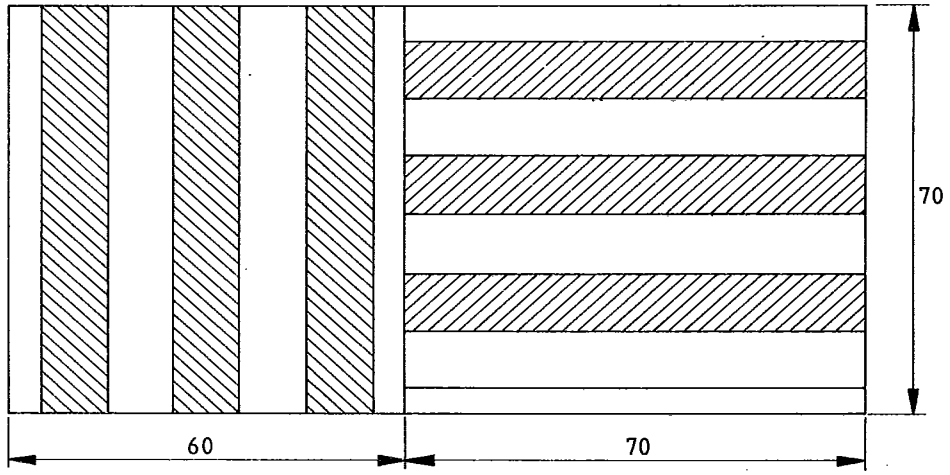
(a) the adhesion of the finish on the individual test specimens with the type of failure (see **A.5.1.4**);

(b) the average adhesion in each direction (and for each location) together with the lowest individual value and type of failure.



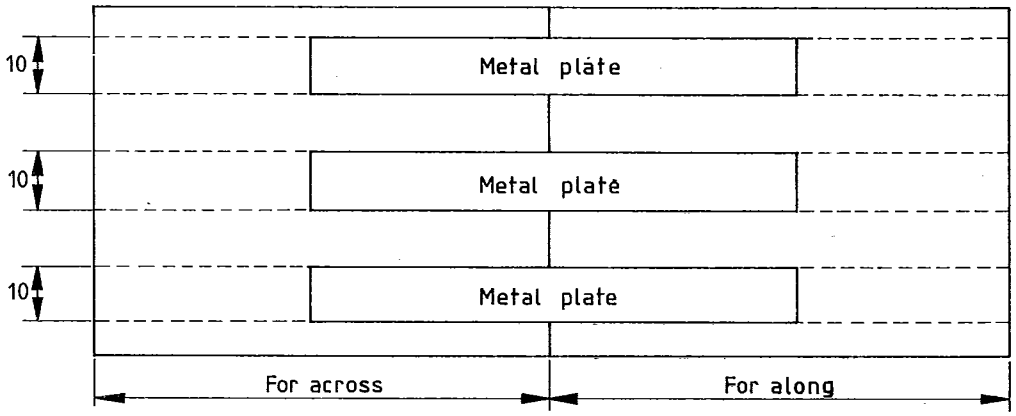
All dimensions in millimetres.

Figure 1. Leather finish adhesion tester



All dimensions in millimetres.

Figure 2. Position of test specimens on leather sample



All dimensions in millimetres.

Figure 3. Arrangement of metal plates on test specimens

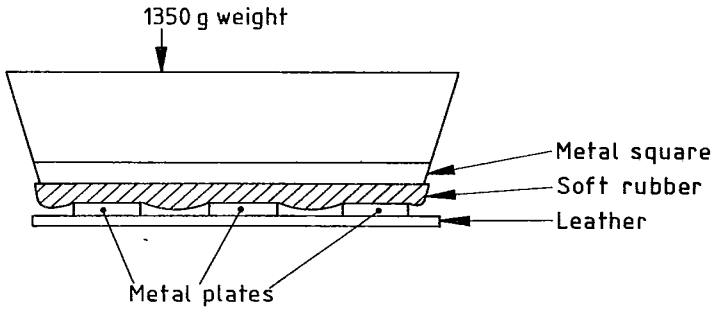


Figure 4. Bonding of metal plates to leather test specimens

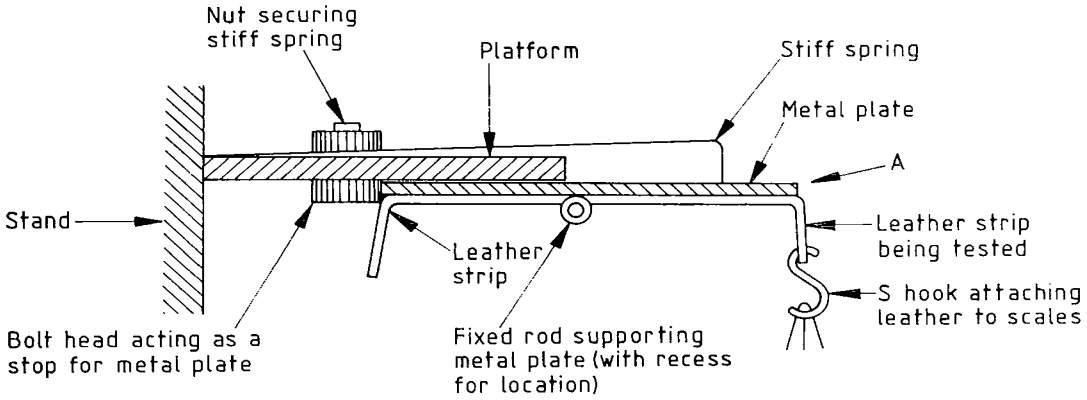


Figure 5. Prepared test specimen in test position

Appendix B

Method for determination of the cold crack temperature

B.1 Principle. A strip of leather is held between two pieces of wood forming a hinged apparatus. The leather is cooled and then creased, grain outwards.

B.2 Apparatus

B.2.1 *Refrigerated cabinet* (see figure 6). The dimensions of the cabinet are not critical but approximately 500 mm × 300 mm × 600 mm has been found suitable. It is essential that the cabinet has forced-air circulation.

NOTE. In figure 6 this is provided by a fan set in the bottom of the cabinet. Cooling can be provided either by solid carbon dioxide placed in triangular trays in the corners of the cabinet or by an independent cooling unit so that air is forced in near the base of the cabinet and exhausted near the top. Temperature is controlled in the first case by intermittent manual switching of the fan to maintain the required temperature. In the latter case a thermostat can be incorporated in the effluent air stream and set to the required temperature.

If a deep freeze cabinet is used then it is again essential to incorporate a fan for air movement over the specimens and a thermostat to maintain the required temperature.

B.2.2 *Hinged apparatus for mounting the specimens* (see figure 7) with holes of 5 mm diameter set 40 mm in from the free edge. These are countersunk on the inside so that the fixing screws for the samples fit flush with the surface and the apparatus can be closed flat. The position of the samples in the open position is shown in figure 8 and in the closed position in figure 9. This enables the cracks (if any) to be examined. The hinged apparatus is placed on two parallel brass rods 125 mm apart as shown in figure 6. Between the brass rods, at the same level, a thermometer is placed in a brass tube for safety. This can be read externally.

B.3 Test specimens. Specimens of leather which measure 90 mm × 12.5 mm with a 5 mm hole punched 5 mm from each end of the sample are taken for testing.

B.4 Procedure

B.4.1 Cut eight test specimens of the leather, one to be tested at each temperature from +5 °C to −30 °C at 5 °C intervals.

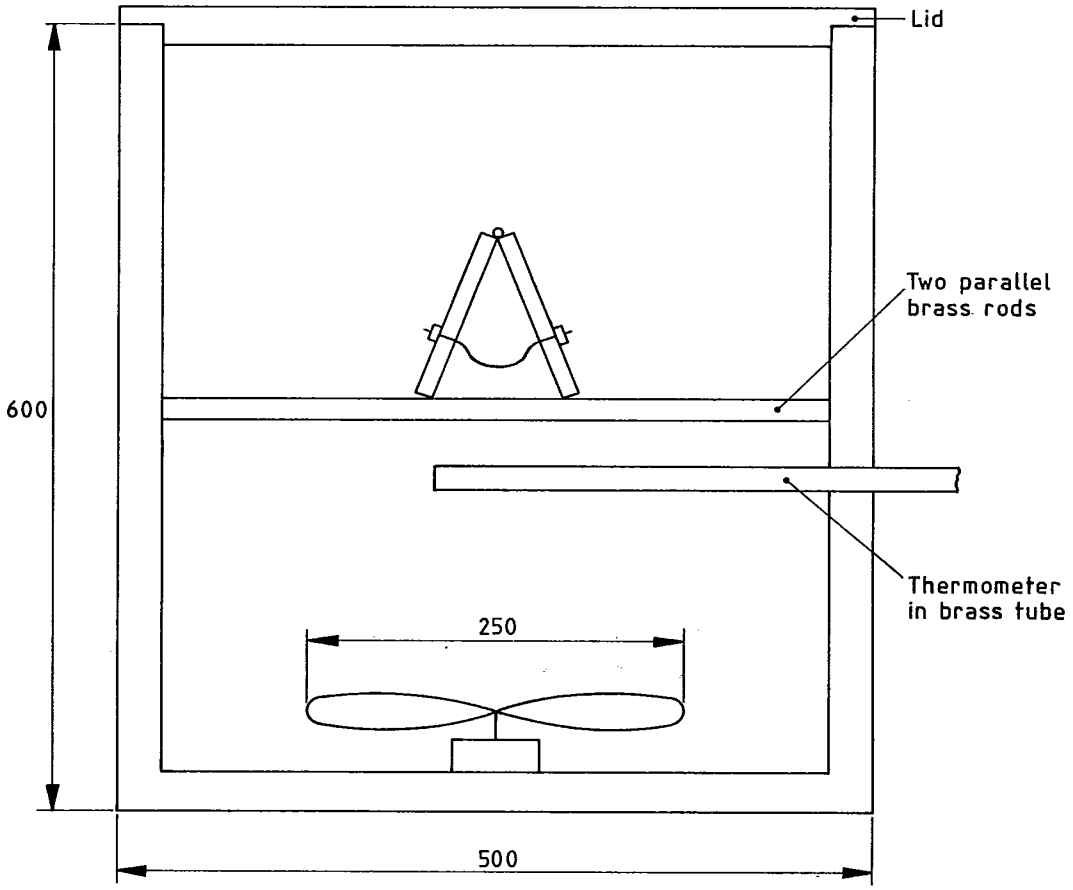
B.4.2 Fix the test specimen in the hinged apparatus. If more than one leather is to be tested at the same time in the hinged apparatus ensure that all leathers are of approximately the same thickness. Thicker test specimens will prevent the thinner ones from being folded flat.

B.4.3 With the hinged apparatus in the open position, place it on the brass rods with the open part facing downwards (see figure 6). Close the refrigerated cabinet and run until the temperature is +5 °C. Maintain this temperature for 5 min.* Then open the cabinet and snap shut the hinged apparatus by hand inside the cabinet. Remove the apparatus from the cabinet and examine the test specimens for cracks. If the test specimen has not cracked replace it by a further test specimen and replace the apparatus in the cabinet. Lower the temperature to 0 °C and maintain for 5 min before once more snapping shut. Repeat the test at −5 °C, −10 °C, −15 °C, −20 °C, −25 °C and −30 °C or until the finish shows cracks. The lowest temperature that can be conveniently reached is −30 °C.

B.5 Expression of results. Record the highest temperature at which the finish cracks and report it as the cold crack temperature.

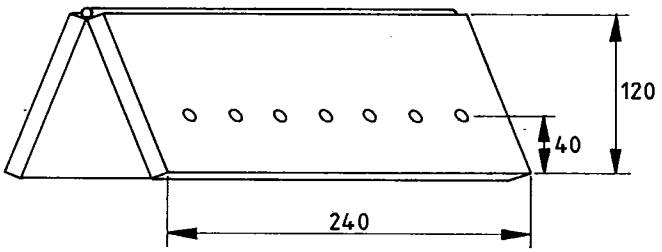
NOTE. Some finishes do not show straight line cracks. Some show small fine cracks and examination with a magnifying glass may be desirable. If the specimen has very fine cracks initially, the end point may not be clear or may be missed.

*5 min is the minimum time, with air movement, which is required for the sample to reach equilibrium in a refrigerated cabinet.



All dimensions in millimetres.

Figure 6. Refrigerated cabinet



All dimensions in millimetres.

Figure 7. Hinged apparatus

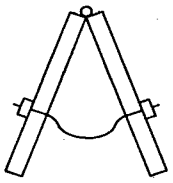


Figure 8. Open position

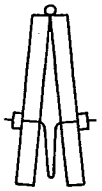


Figure 9. Closed position

Publications referred to

BS 871	Specification for abrasive papers and cloths
BS 1006	Methods of test for colour fastness of textiles and leather
BS 2747	Textile care labelling code
BS 2780	Glossary of leather terms
BS 3144	Methods of sampling and physical testing of leather
BS 4961	Methods for determination of dimensional stability of textiles to dry cleaning in tetrachloroethylene Part 1 Machine method

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This British Standard, having been prepared under the direction of the Textile Products and Leather Standards Committee, was published under the authority of the Executive Board and comes into effect on **29 February 1984.**

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The following BSI references relate to the work on this standard:
Committee reference TLM/27 Draft for comment 82/38020 DC

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Textile Products and Leather Standards Committee (TLM/-) to Technical Committee TLM/27 upon which the following bodies were represented:

British Clothing Industry Association
British Leather Federation
British Leather Manufacturers' Research Association
International Wool Secretariat
Mail Order Traders' Association of Great Britain
Ministry of Defence
Society of Leather Technologists and Chemists
Textile Research Council

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