BRITISH STANDARD

BS 5131 : Section 4.8 : 1990

Methods of test for

Footwear and footwear materials

Part 4. Other components

Section 4.8 Resistance of heels of ladies' shoes to lateral impact

NOTE. It is recommended that this Section should be read in conjunction with BS 5131 : Part 0, published separately.

Méthodes d'essai des chaussures et matériaux pour chassures
Partie 4. Autres composants
Section 4.8 Résistance des talons de chaussures de femmes au choc latéral

Prüfung von Schuhwerk und Schuhwerkstoffen
Teil 4. Weitere Einzelteile
Abschnitt 4.8 Widerstand von Damenschuhabsätzen gegen Schlagbeanspruchung

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STANDARDS

Foreword

This Section of BS 5131 has been prepared under the direction of the Textiles and Clothing Standards Policy Committee. It supersedes BS 5131 : Section 4.8 : 1975, which is withdrawn.

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

Method

1 Scope

This Section of BS 5131 describes a method for determining the impact strength of the heels of ladies' shoes. The result provides an assessment of the liability to failure under the occasional heavy blows received during wear.

NOTE. While the method is applicable to all types of high heels, of whatever construction, it is particularly useful for injection-moulded plastics heels which incorporate a steel dowel reinforcement, giving information on the suitability of the dowel's hardness or softness. Heels which by virtue of their shape have a high lateral impact resistance do not normally require to be tested in this way.

2 Principle

A heel, clamped with the tip uppermost and the stem approximately vertical, is subjected repeatedly to measured blows from a pendulum striker, the energy of the blows increasing successively until the heel fails.

3 Apparatus and material [1)]

3.1 *Lateral impact tester*, an example of a suitable apparatus being shown in figure 4.8/1. The apparatus is clamped either onto a solid built-in bench, or onto a rigid free-standing frame anchored to the floor.

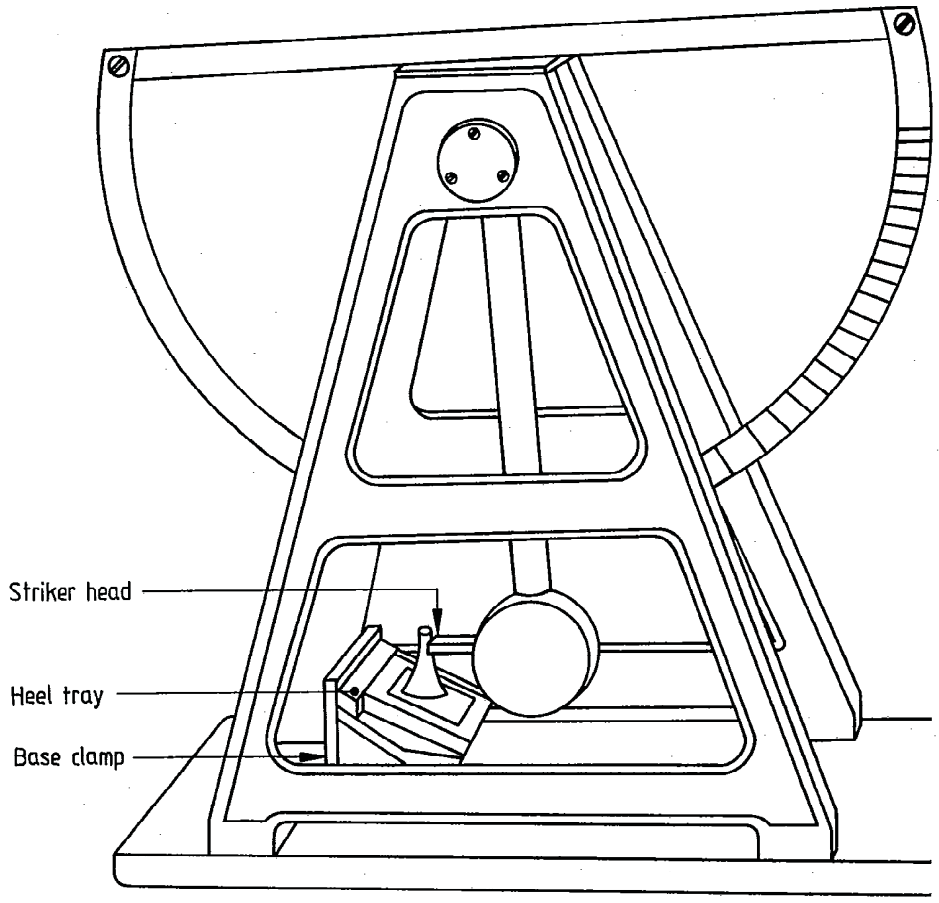

Figure 4.8/1. Lateral impact tester

[1)] For information on the availability of suitable apparatus and material to perform this test, apply to Enquiry Section, BSI, Linford Wood, Milton Keynes, MK14 6LE quoting the number of this standard and the clause number referring to the items concerned. Enclose a stamped addressed envelope for reply.

The lateral impact tester has the following features:

(a) *pendulum,* consisting of a circular steel bob of diameter 108 ± 1 mm and thickness 49 ± 2 mm which is fixed by a circular steel shaft of diameter 25 ± 0.5 mm to a hub, on the bearing axle, of diameter 75 ± 1 mm. The distance from the centre of the bob to the centre of the hub is 432 ± 2 mm. The moment of the pendulum when it is held horizontally is 17.3 ± 0.2 N·m (12.7 ± 0.2 ft·lbf);

(b) *striker head,* consisting of a strip of metal 6.0 ± 0.5 mm thick, 25.0 ± 0.5 mm wide and 35 ± 2 mm long with the striking edge rounded to a radius of 3.0 ± 0.5 mm. The head is fixed rigidly to the pendulum bob so that the striker tip and centre of the bob lie on the same circle of swing of the pendulum and are 89 ± 2 mm apart.

(c) *energy scale for the pendulum,* calibrated in increments of 0.68 J (0.50 ft·lbf) from 0 J (0 ft·lbf) to 18.3 J (13.5 ft·lbf). A marker attached to the pendulum moves over this scale and enables the pendulum to be set up to the desired energy of blow;

(d) *base clamp,* for holding the metal mounting tray (**3.2**) and for adjusting it vertically and horizontally to achieve correct alignment of the heel tip.

NOTE. If the apparatus is not firmly mounted, there is partial loss of energy on impact, thereby producing false results.

3.2 *Metal mounting trays,* as illustrated in figure 4.8/2, each to contain a heel set in metal alloy of melting point between 100 °C and 150 °C.

3.3 *Metal alloy,* melting point between 100 °C and 150 °C.

4 Preparation of test specimen assemblies

4.1 Take three heels and set each heel in a dry metal mounting tray (**3.2**) using the procedure described in **4.2** or, for very short heels (usually those below 40 mm in height), the procedure described in **4.3**.

4.2 Place the heel centrally in the tray so that the seat breast edge is against a flat end of the tray, and the heel tip points upwards. Pour molten metal alloy (**3.3**) at a suitable minimum temperature into the tray, filling the space around the heel to within 3 mm from the top. Allow the alloy to cool and set thereby providing a rigid mounting for the heel.

4.3 Since some very short heels cannot be struck correctly by the striker if mounted in accordance with **4.2** (because the bottom of the pendulum catches the base clamp assembly), a different method of mounting is necessary. In such cases mount the heel with the rear of the heel seat against a flat end of the tray. Cut a small amount from the rear of the heel so as to set the heel further towards the rear of the mounting tray if this allows the striker to strike the heel correctly.

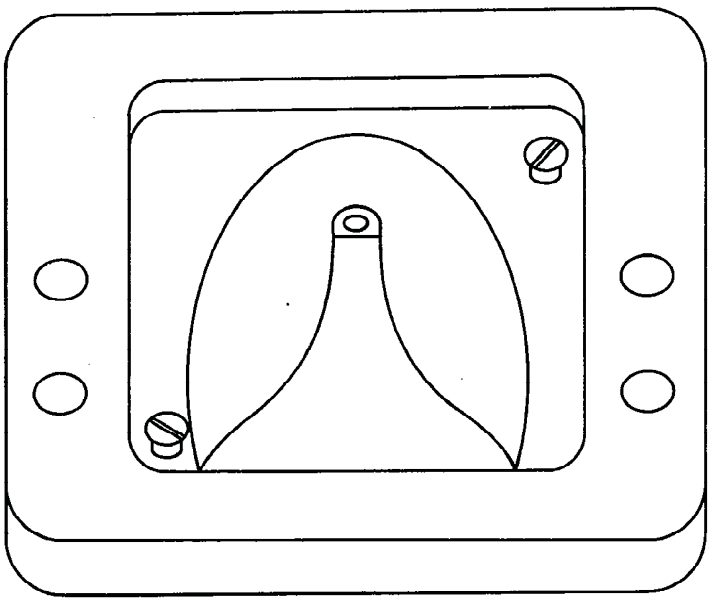

Figure 4.8/2. Metal mounting tray with heel in position before addition of molten alloy

5 Procedure

5.1 Position a test specimen assembly in the lateral impact tester (**3.1**), sliding the assembly up the inclined plane of the base clamp as far as possible and locking into position with the back of the heel facing the pendulum. Set the test specimen assembly at a suitable angle to the horizontal so that the blow will be applied at right angles to the heel stem. Adjust the clamp so that the heel just contacts the striker when the pendulum is vertical, with the tip of the heel 6 mm above the striker tip.

5.2 Lift the pendulum to the 0.68 J (0.50 ft·lbf) position and release, so that the striker falls against the heel stem. Catch the pendulum on its rebound to prevent a second blow. Repeat this procedure, increasing the impact energy at each blow by 0.68 J (0.50 ft·lbf) either until the heel stem breaks, until it bends and the pendulum jams, or until an impact energy of 18.3 J (13.5 ft·lbf) has been applied. Record the total number of blows delivered.

5.3 Damage involving fracture or cracking of the heel at the point of impact of the striker is regarded as invalid in this test, since it is due to the effect of the striker acting as a chisel rather than fracture of the heel due to impact at the heel as in wear. If such damage occurs, report it together with this explanation.

5.4 Test the other two heels by the same procedure.

6 Expression of results

Express the result for each of the three heels as follows:

(a) the number of blows to failure (or that no failure occurred after 27 blows) and the energy in J (ft·lbf) of the last blow;

(b) the type of failure, as described in **5.2**, or the fact that damage involving fracture or cracking of the heel at the point of impact occurred, as described in **5.3**

7 Test report

The test report shall include the following items:

(a) results for each heel, expressed in accordance with clause **6**;

(b) nature and full identification of the sample;

(c) reference to this method of test, i.e. BS 5131 : Section 4.8;

(d) date of testing.

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/39, upon which the following bodies were represented:

British Footwear Manufacturers' Federation
British Leather Confederation
British Rubber Manufacturers' Association
British Steel plc
Consumer Standards Advisory Committee of BSI
Cork Industry Federation
Footwear Components Federation
Footwear Distributors' Federation
Institute of Trading Standards Administration
Iron and Steel Trades Confederation
Lancashire Footwear Manufacturers' Association
Mail Order Traders' Association of Great Britain
Ministry of Defence
National Union of Footwear, Leather and Allied Trades
Office of Fair Trading
SATRA Footwear Technology Centre

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

British Adhesives and Sealants Association
British Paper and Board Industry Federation
British Plastics Federation
Multiple Shoe Retailers' Association
RAPRA Technology Ltd.

This British Standard, having been prepared under the direction of the Textiles and Clothing Standards Policy Committee, was published under the authority of the Board of BSI and comes into effect on 31 December 1990

First published February 1975
Second edition December 1990

The following BSI references relate to the work on this standard:
Committee reference TCM/39
Draft for comment 89/36229 DC

ISBN 0 580 18748 9

Amendments issued since publication

Amd. No.	Date	Text affected

BSI, 2 Park Street, London W1A 2BS BSI, Linford Wood, Milton Keynes MK14 6LE