

Methods of test for

Footwear and footwear materials —

Part 1: Adhesives —

Section 1.7 Preparation of test assemblies using hot melt adhesives for heat resistance (creep) and peel tests

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

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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.

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Foreword

This Section of BS 5131 has been prepared under the direction of the Textiles and Clothing Standards Policy Committee. It supersedes BS 5131-1.7:1981, which is withdrawn.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, 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 Section describes methods for the preparation of test assemblies with various forms of hot melt adhesive by methods which simulate their use in shoe manufacturing for sole attaching, adhesive lasting and the laminating of upper components.

Where the test assemblies are prepared by indirect bonding, they are intended for use in either the resistance to heat (creep test) described in BS 5131-1.1 or the resistance to peeling test described in BS 5131-1.2. However, where the test assemblies are prepared by direct bonding, they are intended for use in BS 5131-1.2 only, since the temperature given in BS 5131-1.1 is not sufficient to soften the adhesive.

The methods of preparation are applicable to a wide variety of combinations of adhesives and materials, but the peel and creep tests of BS 5131-1.1 and BS 5131-1.2 require at least one adherend to be flexible.

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

2 Principle

2.1 General

Rectangular pieces of adherend materials are prepared and bonded to form a test assembly. The test assemblies are of a suitable size to provide test specimens in accordance with the methods given in BS 5131-1.1 and BS 5131-1.2. They differ from those for the solvent-based adhesives described in BS 5131-1.3 as follows.

- a) The methods of adhesive application and bonding are different.
- b) For some methods of adhesive application, there are limitations to the width of the band of adhesive which can be applied. As a consequence, certain test assemblies have the same width as a test specimen (instead of having twice the width of a test specimen, as preferred in BS 5131-1.3 and illustrated in Figure 1 of BS 5131-1.3:1991).

Bonding may be by direct or indirect methods, depending on the form of the adhesives and the intended conditions of use.

2.2 Direct bonding

The adhesive is applied to one adherend as a molten ribbon and the assembly is closed and bonded immediately.

NOTE This method should normally be used for peel testing of lasting adhesives and may be appropriate for peel testing of sole-attaching adhesives.

2.3 Indirect bonding

A solidified layer of adhesive is applied to one or both adherends in the form of one of the following:

- a) a precoating already applied;
- b) a coating applied as described in 5.2.3.1;
- c) a film attached to or laid on the adherends.

The adhesive is either heat reactivated immediately before pressing to form a bond or is activated by hot pressing an assembly of both adherends.

NOTE 1 The indirect bonding method is used for heat resistance (creep) testing and peel testing of sole attaching adhesives and for the peel testing of upper laminating adhesives.

NOTE 2 The bonding methods given in 2.2 and 2.3 are in commercial use. The choice of method for preparing test assemblies should be determined by the recommendations of the adhesive supplier, the shoe factory practice being simulated, or the possible conditions of use which are being studied. Further variations of these procedures are permissible, if necessary, to correspond to particular factory conditions or to simulate the use of hot melt adhesives for operations other than lasting or sole attaching. In all cases the bonding conditions should be stated as described in the appropriate test report, i.e. clause 11 of BS 5131-1.1:1991 or clause 10 of BS 5131-1.2:1991.

3 Number and size of test specimens, and surface preparation of adherends

3.1 Indirect bonding

3.1.1 Creep testing

3.1.1.1 General

The surface preparation techniques (that is, roughing and solvent wiping) are carried out in the same manner as described in 4.1.3 and 4.1.4 of BS 5131-1.3:1991. Similarly, the surface preparation methods for specific materials (that is, which preparation technique is to be used for a particular type of material) are the same as in 4.2 of BS 5131-1.3:1991.

3.1.1.2 Procedure

For each test condition being investigated, produce sufficient test assemblies to enable 15 test specimens 30.0 ± 0.5 mm by approximately 100 mm to be prepared. (See clause 9 of BS 5131-1.1:1991.)