BRITISH STANDARD

BS 1186-3: 1990

Incorporating Amendment No. 1

Timber for and workmanship in joinery —

Part 3: Specification for wood trim and its fixing

ICS 79.080

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Timber Standards Policy Committee (TIB/) to Technical Committee TIB/22, upon which the following bodies were represented:

British Wood Preserving Association
British Woodworking Federation
Department of the Environment (Property Services Agency)
Department of the Environment (Building Research Establishment)
Fibre Building Board Organization (FIDOR)
Incorporated Assocation of Architects and Surveyors
Institute of Clerks of Works of Great Britain Inc.
Joinery Managers' Association Ltd.
London Housing Consortium
Royal Institute of British Architects
Royal Institution of Chartered Surveyors
Scottish Timber Trade Association
Steel Hingemakers Association
Swedish Finnish Timber Council Ltd.
Timber Research and Development Association
Timber Trade Federation

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

The following BSI references relate to the work on this standard:
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Amendments issued since publication

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Contents

Foreword

This Part of BS 1186 has been prepared under the direction of the Timber Standards Policy Committee and it supersedes BS 584, which is withdrawn. It brings together in one Part updated versions of those clauses and figures of BS 1186-1:1971, BS 1186-2:1971 and BS 584:1967 that dealt with wood trim, and relates to both softwood and hardwood (which was omitted from BS 584).

The other Part of BS 1186 is Part 2 Specification for workmanship.

Part 1 Specification for timber is superseded by BS EN 942:1996 Timber in joinery — General classification of timber quality.

This Part of BS 1186 covers exterior and interior wood trim as described in **1.0.1**. It should be noted that this description is more extensive than is usually understood for wood trim in that, for example, it includes interior solid timber panelling and exterior solid timber cladding and fascias. It also includes rectangular or moulded sections, with planed, sawn or sanded surfaces.

Four quality classifications are given for wood trim.

A percentage of wood trim is sold "as seen". However, a significant percentage is covered by written purchase specifications and will continue to be so covered. Until the publication of this Part of BS 1186, wood trim had usually been included in specifications under the category of "joinery".

Wood trim is usually manufactured and sold over length to be end trimmed at a later stage, often by a different company from that which produced the wood trim. Account has been taken of this in the drafting of this Part of BS 1186.

Owing to the difficulty in distinguishing sapwood from heartwood in some species, preservative treatments have to be specified for some species for exterior use.

It has been accepted that the standard profiles that were detailed in BS 584 have not been successful in encouraging standardization. The Technical Committee has consulted with the timber trade and users and has consequently agreed sizes for a limited range of profiles in common use. These are presented in Appendix E. Specifiers and traders are encouraged to specify these profiles to begin the process of achieving the economies and the convenience of interchangeability which are possible with standardization. It should be realized that the profiles may not be stock items although it is hoped that some will be stocked by merchants in at least one of the classes of this Part of this standard. To assist in specifications, a British Standard reference has been allocated to each profile.

Since this Part of BS 1186 specifies both the manufacture and fixing of wood trim, any claims of compliance with this Part of BS 1186 should state clearly the sections of this Part of BS 1186 with which compliance is claimed.

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.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 28, 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.

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Section 1. General

1.0 Introduction

1.0.1 This Part of BS 1186 specifies requirements for timber species and quality classifications of wood trim, including profiled boarding, at the time that it is handed over from the producer to the first purchaser, or subsequently to another purchaser or the company that will fix the wood trim or profiled boarding.

This Part of BS 1186 also specifies requirements for fixing wood trim, including profiled boarding, which permit a certain amount of end trimming at the time of fixing and making good at the time of decoration. Providing that the required extent of end trimming does not exceed that specified in section 5, the wood trim at the time it is supplied is considered to comply with this Part of BS 1186 (see also **1.0.11**).

For the purposes of this Part of BS 1186, "wood trim" includes the following.

a) *Exterior:* barge boards, fascia boards, architraves, weather trims (e.g. between a window and a wall), exterior solid timber cladding and ancillary trim (tongued and grooved, square edged and shiplap), mouldings and cover strips.

b) *Interior:* skirting boards, picture rails, architraves, cornices, mouldings (e.g. scotia, half rounds, astragals, cover strips and fillets), interior solid timber panelling and ancillary trim (tongued and grooved, square edged and shiplap) and window boards. Certain other items supplied loose but intended to be fixed to joinery and to be a functional part of the joinery (e.g. handrails, newel posts and spindles, door weatherdrips, windowheads and planted stops) should comply with BS EN 942 and BS 1186-2, and are not covered by this Part of BS 1186.

1.0.2 In the past, most specifications for timber have tended to refer to commercial gradings which, in themselves, are insufficient to ensure a correct specification for wood trim. This Part of BS 1186 continues the policy followed in the other Parts of BS 1186, of eliminating all references to commercial grading of timber.

1.0.3 There are various stages at which the quality of wood trim can be assessed. Due to the way in which wood trim is supplied and fixed (i.e. perhaps requiring end trimming before fixing, and making good as part of the decoration process), this Part of BS 1186 deals with the times at which quality and workmanship are assessed in a different way from BS 1186-1 and BS 1186-2.

1.0.4 To establish the class (see **4.1**) appropriate to wood trim for a particular use, reference should be made to the appropriate British Standard for the product. However, if no class is defined in the British Standard, or if no British Standard exists for the product, it is necessary for the class(es) to be selected and agreed between the producer and the purchaser (see Appendix A).

1.0.5 The classification system used should not be confused with similarly designated classifications in other British Standards (e.g. class 1, 2, etc. specified in BS 476-7, which is applicable to spread of flame characteristics).

1.0.6 This Part of BS 1186 follows the policy of BS 1186-1 in not requiring the timber to be marked to identify its class.

1.0.7 To meet the end use requirements of various items of wood trim, an assessment of the suitability of the more commonly available timber species is given in Appendix B and Appendix C.

1.0.8 Clauses on laminated, finger jointed and edge jointed timber (see **4.11** and **4.12**) are included to enable more effective use to be made of the available supplies of timber and to promote greater consistency, economy and improved stability. Laminating, finger jointing and edge jointing are not detrimental to the performance of wood trim and are likely to confer additional dimensional stability.

1.0.9 Recommendations for maintaining the moisture content of wood trim are given in Appendix D.

1.0.10 Appendix E includes a limited range of dimensioned profiles which are in common use and are intended to encourage standardization. To assist in the preparation of written specifications, each profile is referenced.

1.0.11 Appendix F gives recommendations for making good at the time of decoration. Providing that the required extent of the making good at the time of decoration does not exceed that recommended in Appendix F, the wood trim as fixed is considered to comply with this Part of BS 1186.

1.1 Scope

This Part of BS 1186 specifies requirements for the timber species, moisture content, classification and quality. It also specifies requirements for the workmanship involved in fixing wood trim.

This Part of BS 1186 applies to wood trim of solid timber or of laminated, finger jointed and edge jointed wood trim that is suitable for use without any decorative finish or with an opaque or non-opaque finish. Reference is made to end trimming which may be necessary at the time of fixing the wood trim, and to making good which may be necessary at the time of decoration.

Appendix A, Appendix D, Appendix E and Appendix F give information and recommendations on the specifying of timber for wood trim, moisture content, typical profiles and making good at the time of decoration respectively.

Appendix B and Appendix C indicate species of softwood and hardwood and their suitability for use as wood trim.

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

1.2 Definitions

For the purposes of this Part of BS 1186, the definitions given in BS 6100-1.0 and BS 6100-4 apply together with the following. Nomenclature is defined in BS 7359.

1.2.1
consignment

delivery of items of wood trim made to a purchaser at any one time

1.2.2
check

separation of fibres along the grain forming a crack or fissure that does not extend through timber or veneer from one surface to the other

1.2.3
joinery

assembly of worked timber components and panel products other than structural timber or cladding

1.2.4
jointed wood

piece of wood made up from smaller pieces joined together end-to-end, such as with finger joints, or built up with face-to-face or with edge-to-edge joints

1.2.5
lamination

layer in laminated wood

1.2.6
shake

separation of fibres along the grain, irrespective of the extent of penetration, due to stresses developing in a standing tree, or in felling, or in drying of converted timber

1.2.7
split

separation of fibres along the grain forming a crack or fissure that extends through timber or veneer from one surface to the other

1.2.8
wood trim

product of uniform profile to be used as a finishing member

NOTE 1 For the purposes of this Part of BS 1186, the definition of wood trim is more extensive than the usual definition of wood trim.

NOTE 2 See **1.0** for examples.

NOTE 3 Typical profiles of wood trim are given in Appendix E.

Section 2. Selection of timber species

2.1 Species of timber for end uses

Timber species shall not be used in situations for which they are stated as being unsuitable in Appendix B and Appendix C.

A timber species stated in Appendix B or Appendix C as being suitable for a particular end use provided that it is preserved shall be preserved in accordance with BS 5589, if it is used for that end.

NOTE Appendix B and Appendix C list some of the species that are generally available in the UK and cross reference each species to the purposes for which they are suitable, suitable if preserved or unsuitable. These lists are not exhaustive and there are other species for use in wood trim, which may be suitable or suitable if preserved but which are not so readily available in the UK.

Section 3. Moisture content

NOTE 1 The requirements of this section are aimed at minimizing any movement or distortion of wood trim by ensuring, as far as possible, that the moisture content of the timber as supplied and fixed is close to the moisture content or moisture content range that it will experience in service. See also Appendix D.
NOTE 2 The requirements of this section relate only to solid timber and not to wood based panel products which usually have equilibrium moisture contents that differ from those of solid timber.

3.1 Moisture content

When measured in accordance with **3.2**, the moisture content of the timber shall either:

a) be as given in Table 1; or

b) if it is not as given in Table 1, the supplier shall be informed of this within 24 h and the timber shall be either:

1) rejected; or

2) treated so that the moisture content is as given in Table 1.

Table 1 — Moisture content limits of solid timber

Category of use	Subcategory based on service condition	Limits of moisture content
		%
Exterior wood trim	All exterior wood trim	13 to 19
Interior wood trim	For buildings with intermittent heating	13 to 17
	For buildings with continuous heating providing room temperatures of 12 °C to 19 °C	10 to 14
	For buildings with continuous heating providing room temperatures of 20 °C to 24 °C	8 to 12[a]

NOTE If the subcategory based on service condition is not stated or is not known at the time of handover, the supplier should agree a moisture content range with the purchaser.

[a] Wood trim at this moisture content is available only by special order or agreement and should be protected, stored and installed in such a manner as to maintain this condition.

3.2 Measurement of moisture content

The moisture content shall be checked at the time of handover (see **1.0.1**) or immediately before fixing, whichever is relevant.

To measure moisture content, an electrical moisture meter that is capable of making individual measurements with an accuracy of 2 % at moisture contents between 7 % and 28 % (but see note 4) shall be used. The meter shall be accompanied by the manufacturer's instructions and all procedures shall be in accordance with these instructions. When a meter having probes is to be used and the piece to be checked is thicker than 15 mm, measurements shall be taken with insulated deep probes.

NOTE 1 Normally, only random checks are required at the time of handover.
NOTE 2 It is preferable to insert probes from a concealed surface so as not to impair the appearance of an exposed surface.
NOTE 3 In reading the meter, due allowance should be made for temperature effects.
NOTE 4 Electrical resistance moisture meters can give grossly inaccurate results when used on timber containing inorganic salts, such as may be the case after treatment with flame retardants or certain waterborne preservatives. In such cases, it may be advisable to refer to the meter manufacturer for a correction factor.

Section 4. Quality of timber prior to the wood trim being fixed

4.1 Classification

4.1.1 Timber for wood trim

Timber for wood trim, whether solid, laminated or edge-jointed, shall have limits of knots and knot clusters for exposed surfaces as given in Figure 1 and shall comply with the appropriate requirements of Figure 1 and **4.2** to **4.13** and shall be classified as follows:

class CSH and class 1	timber for high quality or specialized trim;
class 2 and class 3	timber for general purpose trim.

NOTE 1 Classes 2 and 3 do not apply to sections of 15 mm × 15 mm or less. CSH (timber for "clear" grade of softwood or hardwood) and class 1 may require special selection and may consequently cost more.

NOTE 2 As can be seen from Figure 1, it is not appropriate to specify class 3 for sections with an exposed surface (see **4.1.2**) of less than 25 mm.

NOTE 3 Some end trimming may be necessary before the wood trim is fixed, and some making good may have to be carried out at the time of decoration. See section 5 and Appendix F.

NOTE 4 It is suggested that small occasional over-size deviations in knots, fissures and straightness of grain (see **4.2**, **4.3** and **4.8**) should not be considered to be sufficiently serious as to require rejection of a piece of wood trim.

4.1.2 Surface categories

Within each class the surface categories shall be as follows:

a) *exposed:* surfaces that after final completion of the work are not concealed;

b) *concealed:* surfaces that after final completion of the work are concealed, not merely by decoration.

NOTE For the purpose of this Part of BS 1186, decoration does not constitute concealment.

4.2 Knots and knot clusters

NOTE Sound knots, tight knots and knot clusters are not detrimental to the use of wood trim, but it is considered desirable to state their size and distribution to enable specifications to be agreed by the producer, specifier and purchaser. See **4.2.2.6**.

4.2.1 Measurement of sizes of knots and knot clusters

4.2.1.1 Individual round, oval, arris, splay, margin and branched knots shall be measured as shown in Figure 2 to Figure 7 respectively to the nearest millimetre as the mean of the larger and smaller dimension.

4.2.1.2 The size of a knot cluster shall be measured to the nearest millimetre as the sum of the mean dimensions of all knots forming the cluster (as indicated in Figure 8).

4.2.2 Limits on the size of knots and knot clusters

4.2.2.1 On exposed surfaces, the limit of the size of round knots measured as shown in Figure 2 shall be derived from Figure 1 for the appropriate timber class and dimension. The sizes of oval, arris, splay, margin and branched knots, and of knot clusters shall be measured as shown in Figure 3 to Figure 8 respectively and that measurement shall be compared with the limits given in Figure 1 for round knots. For arris knots, the limit applies to both surfaces on which the knot appears if such surfaces are exposed.

4.2.2.2 The maximum knot size on exposed surfaces of class CSH timber shall be 6 mm.

4.2.2.3 Individual knots or knot clusters on exposed surfaces of timber of classes 1, 2 and 3, measured as indicated in Figure 2 to Figure 8, shall not exceed the size given in Figure 1 for the appropriate class and dimension of the finished or sawn size of the timber. The method of measuring the finished size of timber shown in Figure 9 shall apply even if a piece is laminated or edge jointed, or is sawn rather than planed or moulded.

4.2.2.4 In the special case where a margin, branched, arris or splay knot occurs on an edge that measures 20 mm or less at a cross section where knots occupy one-third or less of the cross section of the timber, the limit for knot size on the edge shall not apply.

4.2.2.5 Other than when wood trim is supplied in random lengths, knot holes and loose knots shall not be permitted on an exposed surface. Random lengths shall have a limitation of one knot hole or loose knot in 3 m on average.

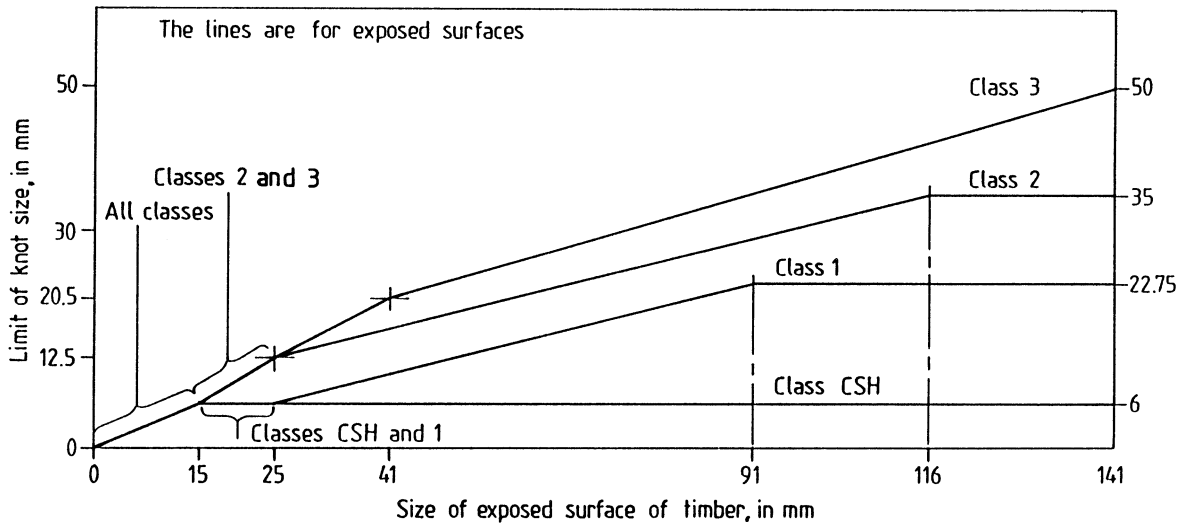
4.2.2.6 Knots on an exposed surface that appear to be unsound or dead, but which are not loose, shall be permitted.

NOTE 1 When unsound, dead and loose knots or knot holes are permitted, this is on the assumption that they will be within the appropriate class limitations given in Figure 1, and that if the surface on which they occur is to be decorated, making good in accordance with Appendix F will take place.

NOTE 2 This Part of BS 1186 places no limit on the size of knots, knot holes or knot clusters on any concealed surface of wood trim.

4.2.2.7 When a splay, margin or branched knot is sound, no limit shall be placed on the size of the knot appearing on the surface that cuts along the knot rather than through the cross section of the knot (see Figure 5 to Figure 7). Loose splay, margin or branched knots shall be regarded as dead knots.

NOTE Splay, margin or branched knots that are sound do not adversely affect the surface that cuts along the knot rather than through the cross section of the knot. Therefore no limit is placed on the size of such knots. Splay knots are, however, particularly liable to become loose.



NOTE 1 The graphs apply to both sawn and planed sizes.

NOTE 2 See Figure 9 for the method of deriving the size of the relevant timber dimension.

Figure 1 — Limits of knots and knot clusters for exposed surfaces of wood trim

4.2.3 Limits on the distribution of knots and knot cluster for CSH class timber

There shall be no limits on the distribution of knots and knot clusters for CSH class timber.

4.2.4 Limits on the distribution of knots or knot clusters for timber of classes other than CSH

For all classes other than CSH, knots of 10 mm or less shall be disregarded when considering the limits on the distribution of knots.

The distribution of knots or knot clusters larger than 10 mm shall be not less than 150 mm centres on average, measured over the length of the piece. When a knot or knot cluster lies within the end 70 mm of a piece and will be trimmed off before the piece is fixed in the final work, the knot or knot cluster and the length of timber that will be trimmed off shall be disregarded in the calculation of average centres.

Average centres shall be calculated as follows:

$$\frac{\text{length of piece}}{\text{number of knots or knot clusters}}$$

4.3 Splits, shakes and checks

NOTE Any making good of shakes or checks carried out at the time of decoration should be in accordance with Appendix F.

4.3.1 Limits of splits

Other than end splits, no class of timber shall contain splits on an exposed surface in the completed work. End splits present in wood trim before it is fixed in place shall be not longer than 70 mm (see also **5.2**).

NOTE 1 There is no limit on splits that occur only on concealed surfaces.

NOTE 2 In permitting end splits up to 70 mm at the time of handover to the purchaser, the assumption is that end trimming will be carried out at the time the wood trim is fixed (see section 5).

4.3.2 Limits of ring shakes

There shall be no ring shakes on any exposed surface in any class of timber.

NOTE There is no limit on ring shakes that occur only on concealed surfaces.

4.3.3 Limits of checks and shakes other than ring shakes and end shakes

4.3.3.1 Other than ring shakes and end shakes, shakes and checks shall be permitted to the following extent on exposed surfaces.

a) For class CSH or class 1 they shall:

1) not exceed 0.5 mm in width;

2) not be continuous for more than 300 mm in any one length;

3) have a depth (see **4.3.3.2**) not exceeding one-quarter of the thickness of the piece;

4) have an aggregated length in the final work not exceeding 50 % of the length of the face on which the shakes or checks are being measured.

b) For class 2 or class 3 they shall be in accordance with item a) with the exception that shakes and checks are permitted up to a width of 1.5 mm.

4.3.3.2 The depth of a shake or check shall be taken as the maximum distance into which a feeler gauge 0.2 mm thick can be inserted.

NOTE It is not considered practical to fill a shake or check of width 0.5 mm or less.

4.4 Limits of resin pockets

There shall be no resin pockets on exposed surfaces of class CSH timber.

NOTE 1 Resin pockets are permitted on exposed surfaces of timber of classes 1, 2 and 3.
NOTE 2 Resin pockets are permitted in timber of classes 1, 2 and 3 on the assumption that, if an exposed surface is to be decorated, the resin pockets will be made good in accordance with Appendix F.
NOTE 3 Resin pockets are permitted on concealed surfaces of any class of timber.

4.5 Limits of sapwood

Sapwood shall be permitted except that, on exposed surfaces of timber of class CSH, discoloured sapwood shall not be visible after decoration unless required as a feature. If sapwood occurs or is likely to occur in species used for exterior wood trim, the timber shall be treated in accordance with BS 5589.

NOTE 1 Blue stain in softwood is a particular example of discoloured sapwood.
NOTE 2 In some species (e.g. Douglas fir) the sapwood contrasts in appearance with the heartwood.

4.6 Limits of wane

There shall be no wane on any timber edge except when the edge is to be concealed in the finished work.

NOTE For the purposes of this Part of BS 1186, decoration does not constitute concealment.

4.7 Limits on rate of growth of softwood

4.7.1 Measurement of rate of growth

Rate of growth of softwood for wood trim shall be measured at both ends of the wood trim and shall be calculated from the average number (in any 75 mm dimension) of growth rings intersecting a straight line normal to the growth rings. The straight line shall either pass through the projected centre point of growth or shall commence 25 mm from the pith, when pith is present (see Figure 10). When a line 75 mm long is unobtainable, the measurement shall be made on the longest line possible normal to the growth rings that would pass through the centre of growth of the piece.

4.7.2 Average rate of growth

The average rate of growth measured in accordance with **4.7.1** shall not exceed the following limits:

a) *softwood for exterior use:* not less than an average of six growth rings per 25 mm;

b) *softwood for interior use:* not less than an average of four growth rings per 25 mm.

NOTE It is inappropriate to specify limitations on the rate of growth of tropical hardwoods. For suitability of hardwoods for various end uses see Appendix C.

4.8 Limit on slope of grain

The slope of grain, as distinct from figure or surface marking and ignoring local deviations of grain, shall be not greater than the following values:

a) one in eight for hardwoods;

b) one in ten for softwoods.

NOTE A method of measuring the slope of grain is described in Appendix B of BS 4978:1973. This can be applied to both softwoods and hardwoods.

4.9 Limits of exposed pith

Pith shall be permitted only on exposed surfaces of cladding and internal boarding, and then only in timber of classes 1, 2 and 3.

4.10 Limits of decay and insect attack

All timber shall be free from decay and insect attack other than Ambrosia Beetle damage.

NOTE Diagnostic features of Ambrosia Beetle damage (sometimes referred to as pinhole or shothole damage) are described in Building Research Establishment Technical Note No. 55 "Damage by Ambrosia (pinhole borer) Beetle" and further information on the subject can be obtained from the Building Research Establishment, Garston, Watford, Herts WD2 7JR, or the Timber Research and Development Association, Hughenden Valley, High Wycombe, Bucks HP14 4ND. The size of the holes alone is not a reliable guide as to whether or not attack is caused by Ambrosia Beetle. Care should be taken to ensure that any holes that are included were in fact caused by Ambrosia Beetle and were not caused by any other insect.

4.11 Laminating and edge jointing

Workmanship for laminating and edge jointing shall be in accordance with BS 1186-2.

NOTE The adhesive used should be suitable for the end use.

4.12 Finger jointing

NOTE 1 Finger jointing with a profile that does not have any noticeable gaps at the tips of fingers is permissible.
The workmanship and quality control for finger jointing shall be in accordance with BS 1186-2.

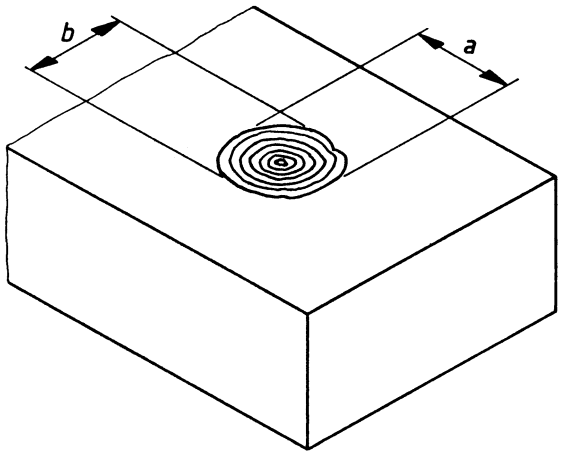
NOTE 2 The adhesive used should be suitable for the intended end use of the wood trim.

4.13 Surface quality

NOTE The surface of wood trim may be sawn, planed or sanded in accordance with the project drawings or project specification.

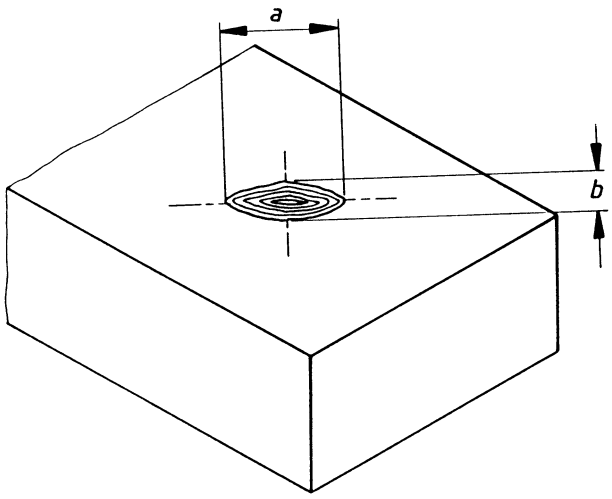
If the surface of interior wood trim is planed, there shall be between 12 and 18 cutter marks per 25 mm.

If the surface of exterior wood trim is planed, there shall be between 8 and 18 cutter marks per 25 mm.



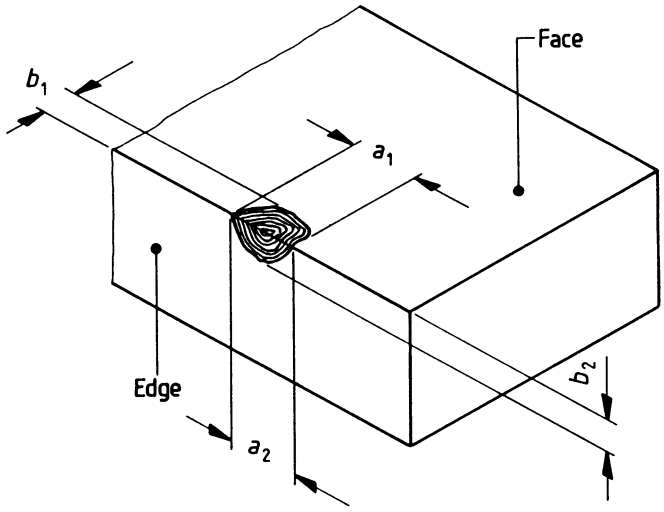
$$\text{Knot measurement} = \frac{a+b}{2}$$

Figure 2 — Round knot



$$\text{Knot measurement} = \frac{a+b}{2}$$

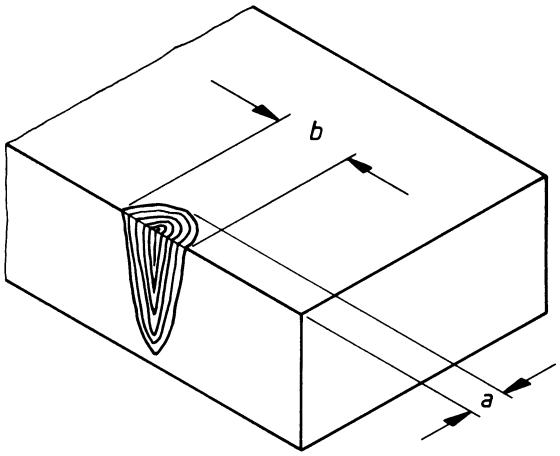
Figure 3 — Oval knot



$$\text{Knot measurement (on face)} = \frac{a_1 + b_1}{2}$$

$$\text{(on edge)} = \frac{a_2 + b_2}{2}$$

Figure 4 — Arris knot



$$\text{Knot measurement} = \frac{a + b}{2}$$

Figure 5 — Splay knot

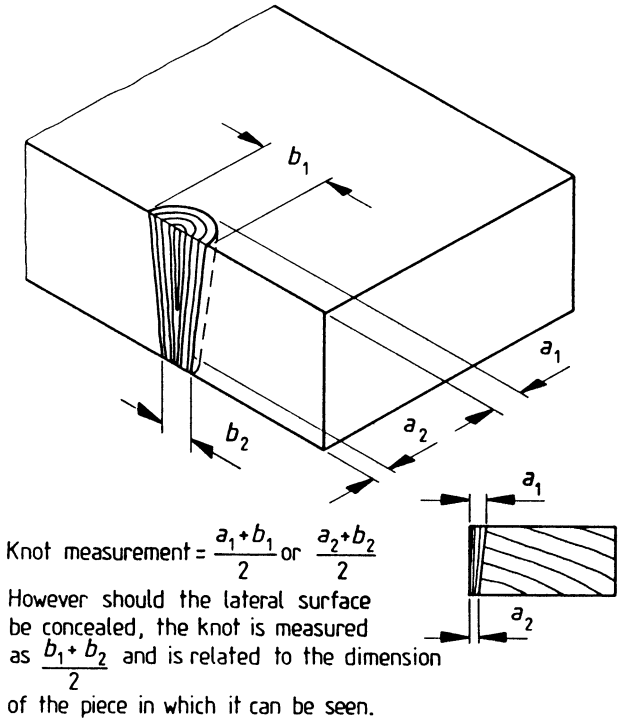
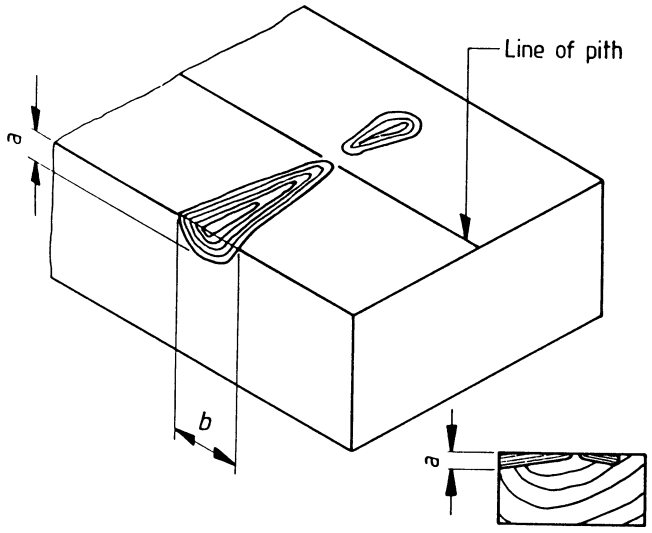


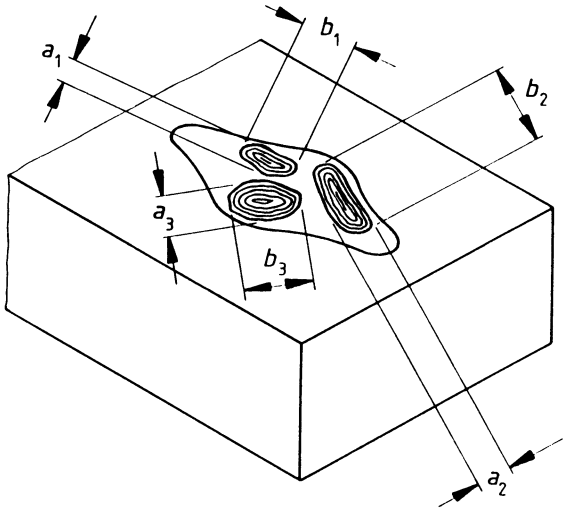
Figure 6 — Margin knot



NOTE 1 A branched knot is measured only if it is cut through (rather than along) by a surface as shown above. Then it is measured as a splay knot and has the same limit and characteristics as a splay knot.

NOTE 2 A knot may be considered to be a branched knot rather than an oval knot if the line of the pith is or was essentially on or close to the surface being considered.

Figure 7 — Branched knot



$$\text{Knot measurement} = \frac{a_1+b_1}{2} + \frac{a_2+b_2}{2} + \frac{a_3+b_3}{2} \text{ etc.}$$

Figure 8 — Knot cluster

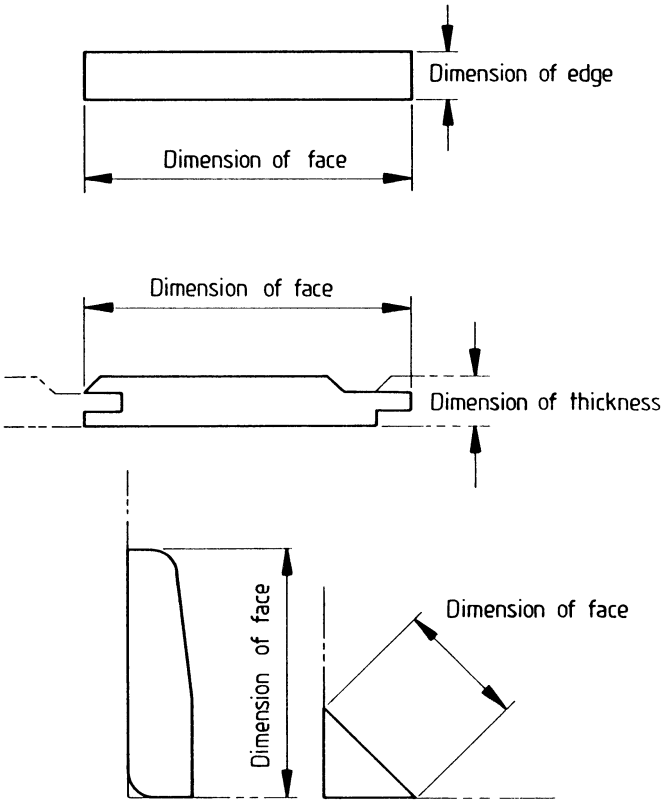
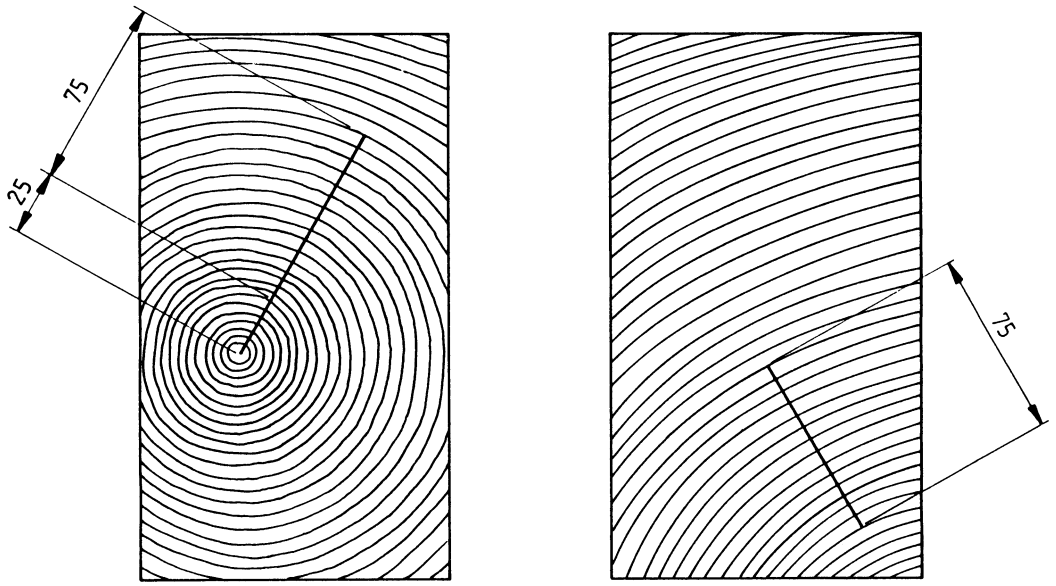


Figure 9 — Examples of the method of measuring the relevant dimension of exposed surfaces of wood trim



All dimensions are in millimetres.

Figure 10 — Measurement of rate of growth

Section 5. Fixing wood trim

5.1 General

The fixing of wood trim shall be carried out in accordance with the project drawings and/or project specification.

NOTE See Appendix F for recommendations concerning making good at the time of decoration.

5.2 End trimming

At the time of fixing wood trim, any end containing an end split shall be trimmed off.

NOTE If an end split is 70 mm or less in length, the wood trim is considered to be within the class limit as supplied before fixing (see **4.3.1**).

5.3 Nailing

Nails shall be driven in such a way as to prevent hammer marks occurring on the surface of the timber, and so as to prevent splitting of the timber. If nails are to be driven below the surface, the driving shall be carried out with a punch smaller than the nail head. If nails are to finish flush with the surface of the wood trim, extra care shall be taken to avoid hammer marks on the surface.

When nailing tongued and grooved, overlapped or shiplap boards, the nails shall be positioned to allow subsequent movement of boards without splitting as a result of nailing restraint.

NOTE 1 In other applications the positions of the nails may also be critical and should be subject to specification.
NOTE 2 For exterior use, or interior use in conditions of high humidity, care should be taken in the specification of nails.
NOTE 3 It is good practice to machine stress relieving grooves into the back of boards in order to reduce the risk of splitting during nailing.

5.4 Fixing by screws

When wood trim is to be fixed by screws, holes shall be predrilled by the fixer.

NOTE 1 Any countersinking should be properly formed to suit the screw head.
NOTE 2 Countersunk screws to be used without holes being countersunk should be placed in surface mounted cups.
NOTE 3 When screws are to be counterbored and plugged, any plug should:

a) be of the same species as the surrounding timber;

b) lie with its grain in the same general direction as the grain of the piece into which it is inserted;

c) be well secured by an adhesive that is suitable for the end use;

d) occupy the whole depth of the hole;

e) be of a diameter not more than 6 mm larger than the size of round knot permitted for the relevant class and dimension of timber (see Figure 1).

NOTE 4 When screwed fixings are to be counterbored and filled, the filler should be suitable for the end use and should be compatible with any finish to be applied.

Appendix A Recommendations for specifying timber for wood trim

A.1 General

Specifiers intending to use this Part of BS 1186 would be well advised, before finalizing contract documents, to consider whether special contractual arrangements should be made. If no such arrangements are made, the requirements of this Part of BS 1186 should be applied.

A.2 Information to be supplied to the manufacturer

The following information should be supplied to the manufacturer:

a) when applicable, the acceptability of timbers not given in Appendix B and Appendix C;

b) the required class(es) and surface category of timber (see **1.0.1** and **1.0.4**);

c) the required subcategory of moisture content at handover selected from Table 2;

d) the point of handover of the joinery from the manufacturer to the first purchaser;

NOTE 1 It is at this point that the wood trim should be checked for compliance with **3.1**.

e) the purpose for which the wood trim is intended when installed, described in accordance with the terms used in Appendix B and Appendix C;

NOTE 2 Without this information it is not possible to establish the suitability of the timber to be supplied.

f) whether an opaque or non-opaque finish is required (see **A.3**).

NOTE 3 Specifiers should be aware that stringent restrictions will almost certainly result in increased cost. Where too stringent restrictions are imposed it may be more economical to select a higher class of timber.

A.3 Identifying characteristics, techniques or remedies and their acceptability with non-opaque finish

When it is intended that wood trim is to have a non-opaque finish, the specifier should consider if any of the following are unacceptable.

a) The use of:

1) laminating without end/finger jointing in the laminations;

2) laminating with end/finger jointing in the laminations;

3) finger jointing of solid sections;

4) edge jointing.

b) The use of remedial treatment where the following natural characteristics occur:

1) resin pockets (see **4.4**);

2) damage arising from insect attack (see **4.10**);

3) knots and other natural characteristics, e.g. shakes (see **4.3**).

NOTE This applies to all classes of timber except in respect of shakes and checks in class 2 or class 3. When filled shakes and checks are not acceptable, a class of timber higher than class 2 should be specified.

c) Discoloured sapwood (see **4.5**).

Appendix B Some species of softwood and their suitability for use as wood trim

Table 2 — Some species of softwood and their suitability for use as wood trim

Species (see note 1)	Characteristics (see note 2)	Average density at 15 % moisture content	Workability	Dimensional movement	Suitability	
					Exterior trim (see note 3)	Interior trim
		kg/m^3				
Cedar, western red (*Thuja plicata*)	Variable reddish brown heartwood, distinct white sapwood. Straight grain, coarse texture. Discolours in contact with ferrous metal if damp. Non-ferrous fittings and fastenings are recommended.	390	B	S	SW	SW
Douglas fir (*Pseudotsuga menziesii*)	Light reddish brown heartwood, paler sapwood. Growth rings clearly defined and inclined to show through paint. Discolours in contact with ferrous metal. Non-ferrous fittings and fastenings are recommended. Long, clear lengths available.	530	B	S	SW	SW
Hemlock, western (*Tsuga heterophylla*)	Pale brown. Growth rings distinguishable. Straight grain, fine even texture. Shipments include amabilis fir (less dense, less strong). Good paint performance in service. Long, clear lengths available.	470 to 500	A	S	SP	SW
Parana pine (*Araucaria angustifolia*)	Golden brown, sometimes with red streaks. Straight grain, fine uniform texture, generally available knot-free. Liable to distort on machining. Good paint performance in service.	550	A	M	X	SW
Redwood, European: Scots pine (*Pinus silvestris*)	Pale yellowish brown to red brown heartwood, paler sapwood. Medium texture. Growth rings clearly marked. Good joinery timber. Good paint performance in service.	510	B	M	SP	SW
Whitewood, European (*Picea abies and Abies spp*)	White to pale yellowish brown. Straight grain, rather fine texture. Good paint performance in service.	470	A	M	SP	SW
See keys and notes following Table 4.						

Appendix C Some species of hardwood and their suitability for use as wood trim

Table 3 — Some species of hardwood and their suitability for use as wood trim

Species (see note 1)	Characteristics (see note 2)	Average density at 15 % moisture content	Workability	Dimensional movement	Suitability	
					Exterior trim (see note 3)	Interior trim
		kg/m^3				
Abura (*Mitragyna ciliata*)	Heartwood and sapwood, light brownish coloured, plain appearance. Medium/fine texture. Tendency to split on nailing. Stains well.	580	B	S	X	SW
Afrormosia (*Pericopsis elata*)	Heartwood deep brown, sapwood light brown. Medium/fine texture.Discolours in contact with ferrous metal if damp. Pre-bore for nailing.	710	B	S	SW	SW
Afzelia (*Afzelia spp.*)	Reddish brown heartwood. Straw coloured sapwood. Grain often interlocked, texture coarse. Pre-bore for nailing. Can stain masonry and textiles if damp.	830	C	S	SW	SW
Agba (*Gossweilerodendron balsamiferum*)	Pale pinkish brown heartwood of uniform appearance, sapwood slightly lighter (border sometimes indistinct). Medium texture. Resinous odour frequent.	510	B	S	SW	SW
Ash, European (*Fraxinus excelsior*)	Generally white to light brown. Medium/coarse texture. Very good bending timber, very tough.	710	B	M	X	SW
Beech, European (*Fagus sylvatica*)	Light reddish brown; if steamed, pink. Fine even texture. Good bending. Stains and polishes well.	720	A/B	L	X	SW
Birch, yellow (*Betula alleghaniensis*)	Wide variation in colour from cream to reddish brown, can include sweet birch (denser, darker). Fine even texture. Stains and polishes well.	700	B	L	X	SW
Cedar, Brazilian (*Cedrela spp.*)	Colour (pale to dark reddish brown) and properties highly variable. Occasional interlocked grain, coarse texture. Fragrant odour. Resin exudation, resin pockets may occur.	480	B	S	X	SW

Table 3 — Some species of hardwood and their suitability for use as wood trim

Species (see note 1)	Characteristics (see note 2)	Average density at 15 % moisture content	Workability	Dimensional movement	Suitability	
					Exterior trim (see note 3)	Interior trim
		kg/m^3				
Cherry, American (*Prunus serotina*)	Colour varies from light straw to reddish brown. Straight fine grain, fine texture. Pith flecks and small resin pockets are common. Stains and polishes well.	590	B	M	X	SW
Chestnut, sweet (*Castanea sativa*)	Heartwood yellowish brown, similar to oak. Sapwood distinct. Coarse texture, tendency to spiral grain. Discolours in contact with ferrous metal if damp. Non-ferrous fittings or fastenings are recommended.	560	B	S	SW	SW
Elm, white (*Ulmus americana*)	Light greyish brown. Straight but sometimes interlocked grain, coarse texture. Good bending properties.	580	B	M	X	SW
Guarea a) (*Guarea cedrata*) b) (*Guarea thompsonii*)	Can be bought separately. Pinkish brown, sapwood pale. Fine texture, often interlocked grain. a) Occasionally exudes resin.	 a) 590 b) 640	B B	S S	SW SW	SW SW
Idigbo (*Terminalia ivorensis*)	Heartwood yellowish to light yellowish brown, sapwood somewhat paler. Coarse texture. Discolours in contact with ferrous metal, can stain masonry if damp. Non-ferrous fittings or fastenings are recommended.	560	B	S	SW	SW
Iroko (*Chlorophora excelsa and C. regia*)	Colour varies from yellowish brown to dark brown, with pale yellow sapwood. Interlocked grain, coarse texture. Very hard, strong.	660	B/C	S	SW	SW
Keruing (*Dipterocarpus spp.*)	Numerous species of similar characteristics. Pinkish brown to dark brown heartwood, plain appearance. Sapwood grey. Straight grain, occasionally interlocked. Exudes resin, sometimes making finishing troublesome. Prone to severe distortion during drying.	740	B	M/L	[a]	X

Table 3 — Some species of hardwood and their suitability for use as wood trim

Species (see note 1)	Characteristics (see note 2)	Average density at 15 % moisture content	Workability	Dimensional movement	Suitability	
					Exterior trim (see note 3)	Interior trim
		kg/m^3				
Lauan Meranti Serayah (*Shorea spp.*)	Name depends on origin: Philippines, Malaysia/Indonesia, Sabah respectively. Produced from numerous species, the timber is sold in a wide variety of colour (dark red, red, light red, yellow, white) with widely varying characteristics. Those with higher density are generally stronger, stiffer and more durable than those with lower density. Interlocked grain, coarse texture.	Dark red 710 Light red 550	A/B	S	SP	SW
Mahogany, African (*Khaya spp.*)	Reddish brown heartwood, yellowish brown sapwood. Interlocked grain, moderately coarse texture.	530	B	S	SW	SW
Mahogany, Central and South American (*Swietenia spp.*)	Pale to dark reddish brown. Some interlocked grain, texture slightly coarse. Gives excellent finish.	560	B	S	SW	SW
Makore (*Tieghemella heckelii*)	Lustrous, pinkish brown to dark red heartwood, paler sapwood. Straight grain, fine texture. Discolours in contact with ferrous metal. Tends to split on nailing.	640	C	S	SW	SW
Maple, rock (*Acer saccharum*)	Pale brown heartwood, white sapwood. Straight grain, fine texture. A strong, taut timber, bends well. Stains and polishes well.	740	B	M	X	SW
Oak (*Quercus spp.*) a) American, red b) American, white c) European d) Japanese	Colour varies, depending on species, from pale yellow brown to reddish mid brown. Sapwood distinct, paler. Straight grain, all species medium texture except c), which may be coarse. Discolours in contact with ferrous metals. Non-ferrous fittings and fastenings are required. Nailing difficult, pre-bore.	a) 790 b) 770 c) 720 d) 670	B B B B	M M M M	X SW SW X	SW SW SW SW
Obeche (*Triplochiton scleroxylon*)	Pale straw coloured. Interlocked grain, moderatelycoarse even texture. A stable, low density, easy to work timber. Stains well.	390	A	S	X	SW

Table 3 — Some species of hardwood and their suitability for use as wood trim

Species (see note 1)	Characteristics (see note 2)	Average density at 15 % moisture content	Workability	Dimensional movement	Suitability	
					Exterior trim (see note 3)	Interior trim
		kg/m^3				
Opepe (*Nauclea diderrichii*)	Yellow to orange yellow heartwood, whitish sapwood. Irregular, interlocked grain, coarse texture, making it unsuitable for small sections. Some surface checking may occur.	750	C	S	S	X
Poplar, American yellow (*Liriodendron tulipifera*)	Yellowish to olive brown heartwood with some dark streaks, whitish sapwood. Straight grain, fine even texture. Smooth finish, good nailing and staining.	510	A	M	X	SW
Ramin (*Gonystylus spp.*)	White to pale straw colour. Straight grain, fine texture. Splits on nailing. Stains well.	670	A	L	X	SW
Sapele (*Entandrophragma cylindricum*)	Medium to dark reddish brown heartwood with a pronounced stripe. Sapwood whitish. Interlocked grain, fine texture.	640	B	M	SW	SW
Sycamore (*Acer pseudoplatanus*)	White to yellowish, lustrous. Generally straight grain, fine even texture.	630	A	M	X	SW
Teak (*Tectona grandis*)	Golden brown heartwood sometimes with dark markings, pale yellowish brown sapwood. Straight or wavy grain, coarse texture. Very stable. Pre-boring recommended for nailing.	660	C	S	SW	SW
Utile (*Entandrophragma utile*)	Reddish or purplish brown heartwood. Pale sapwood. Interlocked grain, open texture.	660	B	M	SW	SW
Walnut, African (*Lovoa trichilioides*)	Heartwood bronze brown with occasional black streaks, sapwood distinct, buff coloured. Interlocked grain, fine texture.	560	B	S	SW	SW
Walnut, American (*Juglans nigra*)	Rich dark brown heartwood, pale sapwood. Grain varies from straight to curly, texture coarse.	660	B	SM	SW	SW

Table 3 — Some species of hardwood and their suitability for use as wood trim

Keys to Table 2 and Table 3

The key for workability is as follows:

A easily worked on bench or machine;
B average workability;
C difficult to work on bench.

The key for dimensional (moisture related) movement is as follows:

S small;
M medium;
L large.

The key for exterior and interior trim is as follows:

SW suitable without preservative treatment;
SP suitable when preservatively treated in accordance with BS 5589;
X unsuitable.

NOTE 1 This is not a comprehensive list of suitable species. There are other species that are suitable for woodtrim but which may not be readily available in the UK. Timbers are listed in alphabetical order and are not in order of importance or according to extent of use.

NOTE 2 The characteristics described are for information only.

NOTE 3 Where sapwood is present in exterior trim, preservative treatment is necessary even where the species is shown as suitable without preservative treatment (SW).

NOTE 4 Dark finishes to trim absorb more heat than light finishes, hence dark finishes are more likely to cause resin exudation, shakes and increased timber movement.

NOTE 5 Even those timbers shown as suitable for external use (SW or SP) can suffer photo-degradation of exposed external surfaces if a non-opaque finish is applied.

NOTE 6 It should be noted that colour variations in timber occur.

NOTE 7 More detailed information can be found in *A Handbook of Hardwoods* (1972) and *A Handbook of Softwoods* (1977) published by and available from the Building Research Establishment, Garston, Watford, Herts WD2 7JR.

[a] Due to excessive movement on drying and the high risk of resin exudation for an indefinite period, keruing is suitable only for cladding; for this use it requires no presservative treatment.

Appendix D Recommendations for maintaining the moisture content of wood trim

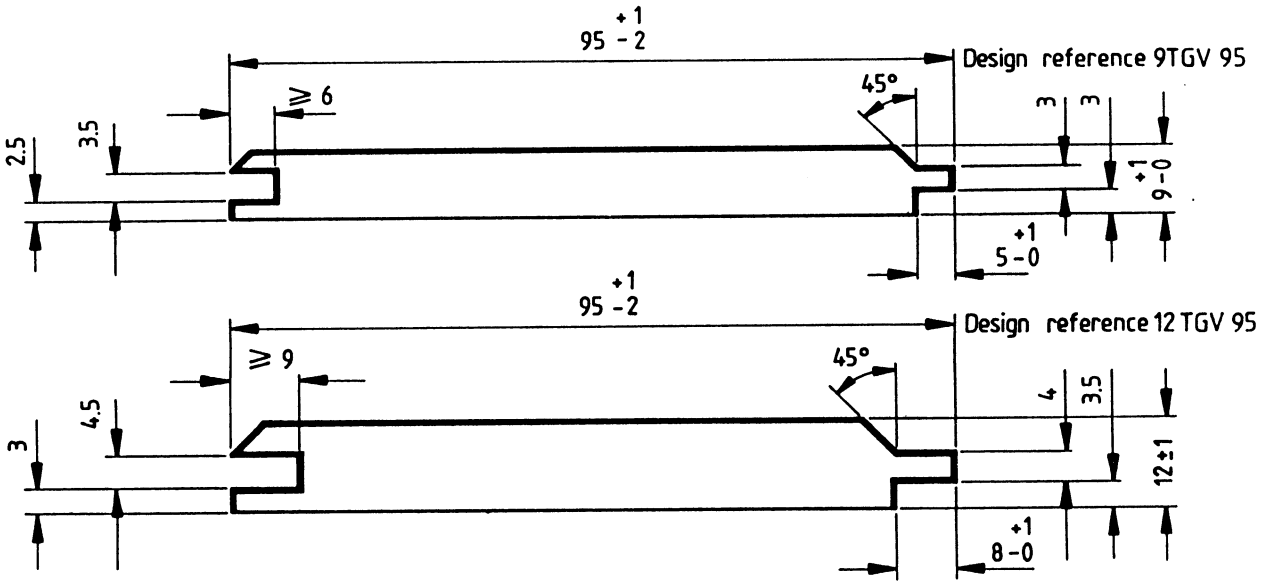
D.1 Precautions should be taken during storage prior to delivery, during transport, and on site, to ensure that the wood trim is adequately protected and so that changes in moisture content caused by weather conditions are minimized.

D.2 Wood trim should at all times be stored on dry bases raised above ground level and wherever possible under cover. If it is necessary to store wood trim in the open under temporary cover, it should be covered with clean tarpaulins or other impermeable material arranged to give full protection but also to permit free passage of air around the trim. Where open storage is unavoidable, this should be for only short periods and deliveries should be arranged accordingly.

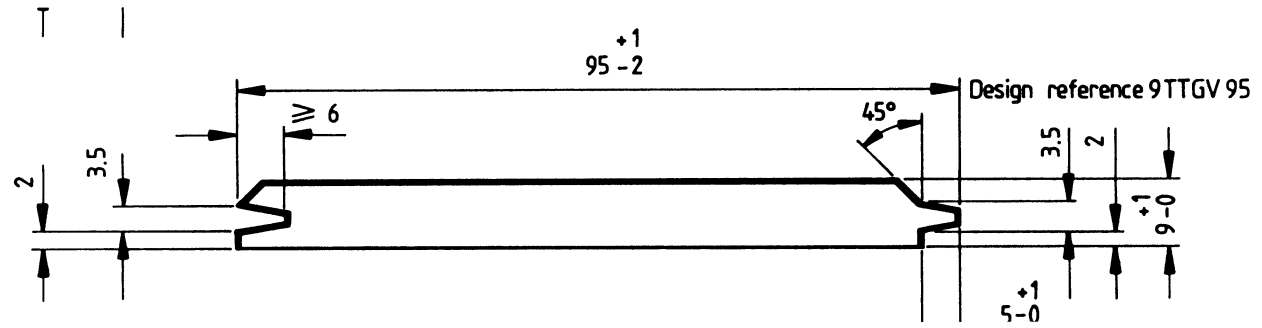
D.3 In new building work, where a considerable amount of water is used, the moisture content of timber may increase and this could cause distortion. Timber should therefore be protected against ingress of moisture during the building process and in particular should be kept clear, if possible, from direct contact with wet work. Ample ventilation should be provided to reduce the risk of moisture pick-up and to ensure quicker drying out. It is recommended that buildings should be made weathertight before any internal wood trim is installed. When wood trim is fixed in close proximity to a source of heat, special precautions should be taken to protect the trim.

Appendix E Typical profiles

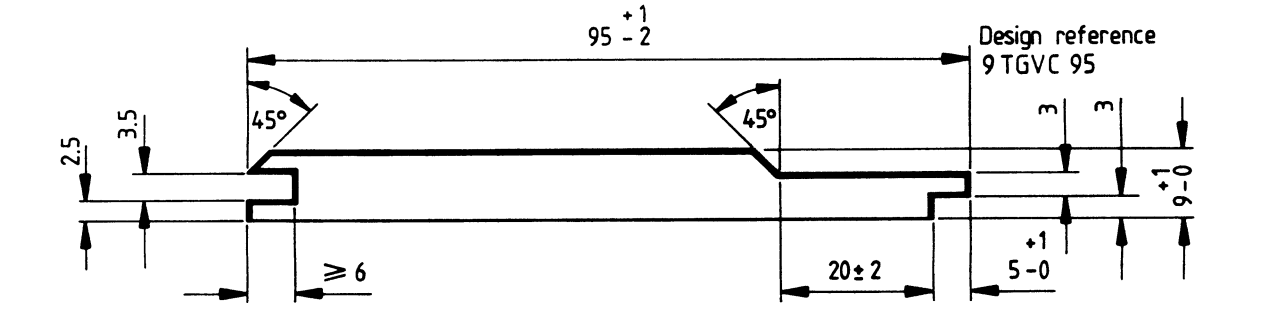
NOTE Where quoted in specifications, the design references given in this Part of BS 1186 should be prefixed with the letters BS, e.g. BS 9 TGV 95.



(a) Tongued, grooved and vee joined

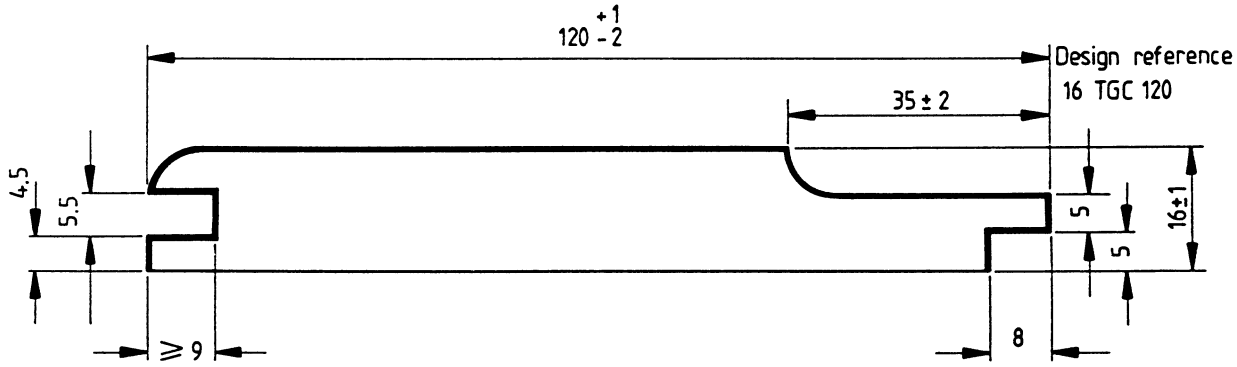


(b) Taper tongued, grooved and vee joined

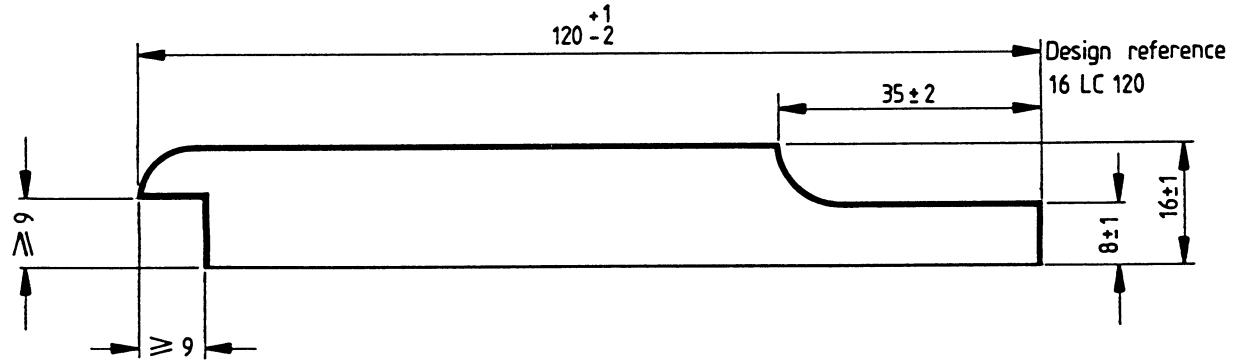


(c) Tongued, grooved, vee jointed and channelled

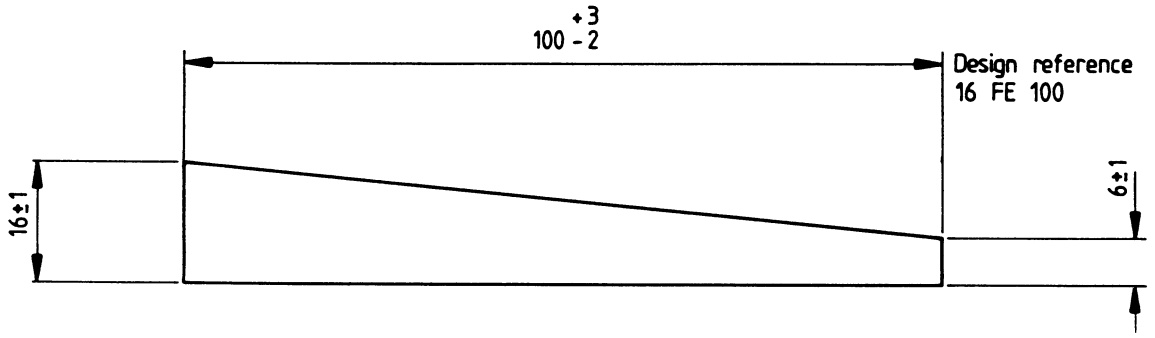
Figure 11 — Cladding



(d) Tongued, grooved and channeled



(e) Lapped and channeled



NOTE All surfaces may be sawn or machined

(f) Feather edged

All sizes are in millimeters

NOTE 1 Thick lines denote a planed or machined surface.

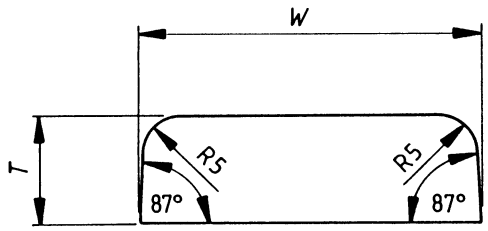
NOTE 2 Board undersides can be fine sawn or hit/miss planed and the underside profile can be varied.

NOTE 3 It is good practice to machine stress relieving grooves into the back of the boards.

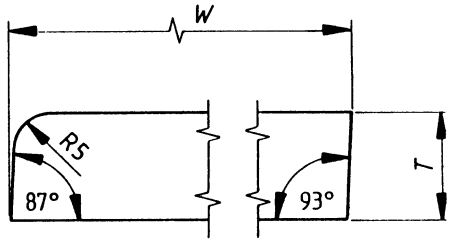
NOTE 4 It is advisable for boards to be machined so that the surface that faced the centre of the tree, when sawn, forms the exposed surface.

NOTE 5 If the back face is to be exposed, it is advisable for it to be machined as well as the front face.

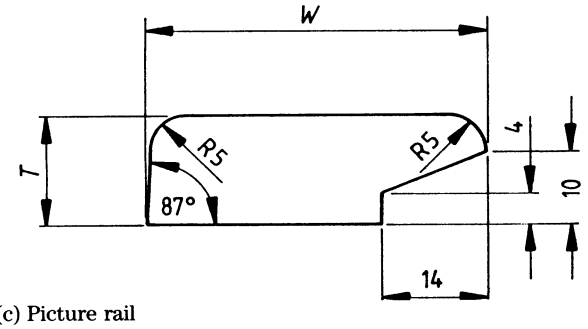
Figure 11 — Cladding *(concluded)*



(a) Architrave



(b) Skirting

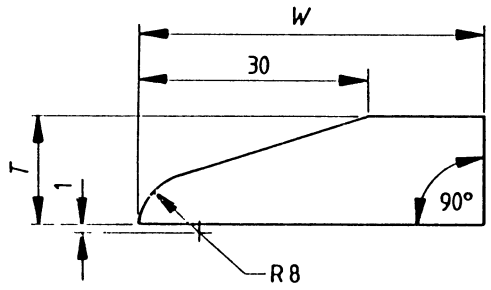


(c) Picture rail

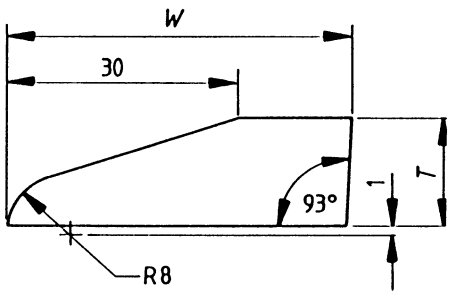
	T	*W*	Design reference
Architrave	9 ×	33	9 RA 33
Architrave	13 ×	45	13 RA 45
Architrave	20 ×	70	20 RA 70
Skirting	13 ×	70	13 RS 70
Skirting	13 ×	95	13 RS 95
Skirting	20 ×	120	20 RS 120
Picture rail	13 ×	45	13 RP 45
Picture rail	13 ×	70	13 RP 70

NOTE All linear sizes are in millimetres.

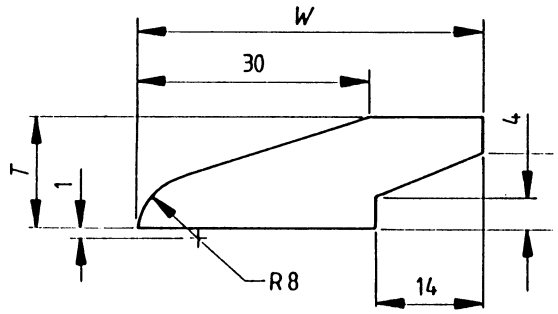
Figure 12 — Rounded trim



(a) Architrave



(b) Skirting

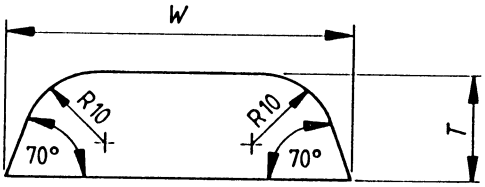


(c) Picture rail

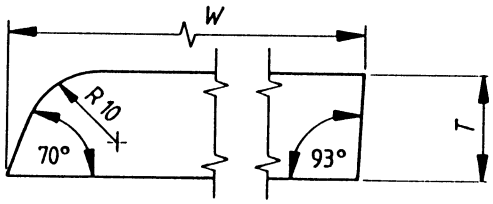
	T	W	Design reference
Architrave	13 ×	45	13 CA 45
Architrave	20 ×	70	20 CA 70
Skirting	13 ×	70	13 CS 70
Skirting	13 ×	95	13 CS 95
Skirting	20 ×	120	20 CS 120
Picture rail	13 ×	45	13 CP 45
Picture rail	13 ×	70	13 CP 70

NOTE All linear sizes are in millimetres.

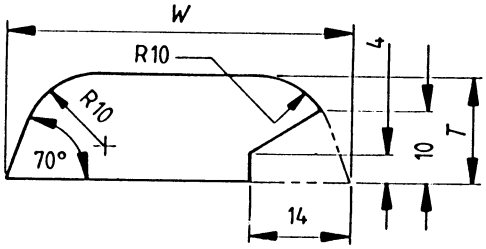
Figure 13 — Chamfered trim



(a) Architrave



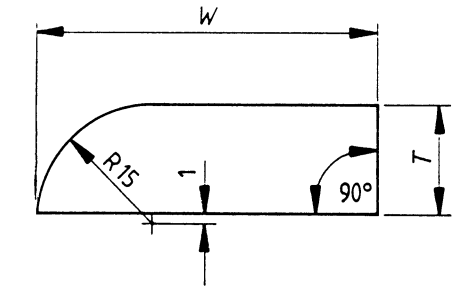
(b) Skirting



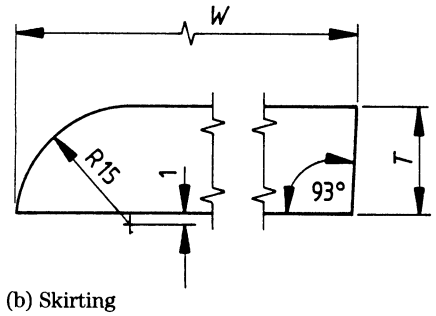
(c) Picture rail

	T	W	Design reference
Architrave	13 ×	45	13 BA 45
Architrave	20 ×	70	20 BA 70
Skirting	13 ×	70	13 BS 70
Skirting	13 ×	95	13 BS 95
Skirting	20 ×	120	20 BS 120
Picture rail	13 ×	45	13 BP 45
Picture rail	13 ×	70	13 BP 70

Figure 14 — Bevelled trim



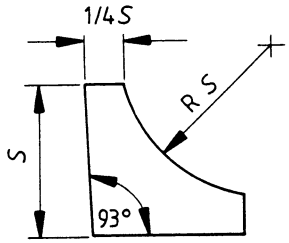
(a) Architrave



(b) Skirting

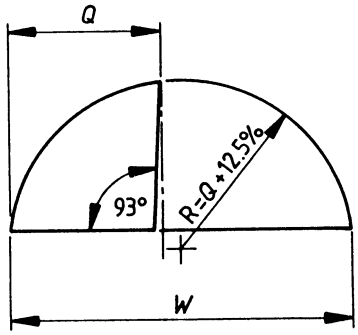
	T	*W*	Design reference
Architrave	13	45	13 HRA 45
Architrave	13	70	13 HRA 70
Skirting	13	70	13 HRS 70
Skirting	13	95	13 HRS 95
Skirting	13	120	13 HRS 120

Figure 15 — Half rounded trim



(a) Scotia

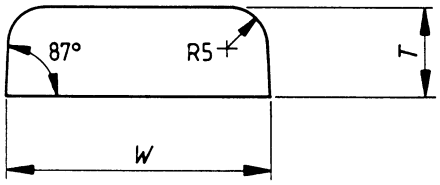
S	*S*	Design reference
13	× 13	S13
20	× 20	S20
27	× 27	S27



(b) Quadrant and half-round

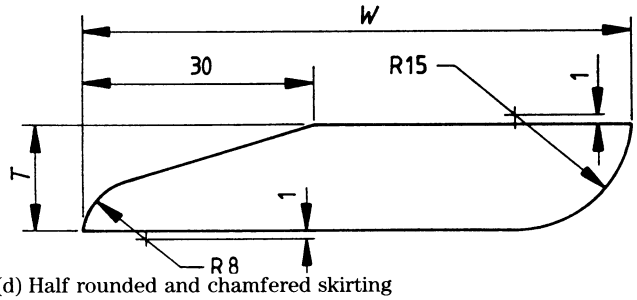
Q	*Q*	Design reference
11	× 11	Q11
13	× 13	Q13
20	× 20	Q20

Q	*W*	Design reference
13	× 33	HR 33
20	× 45	HR 45



(c) Cover fillet

T	*W*	Design reference
11	× 33	C33
11	× 45	C45



(d) Half rounded and chamfered skirting

T	*W*	Design reference
12	× 95	12 HRCS 95
15	× 95	15 HRCS 95

Figure 16 — Miscellaneous trim

Appendix F Making good at the time of decoration

F.1 General

F.1.1 Provided that wood trim as supplied and fixed is within the timber class limits of this Part of BS 1186, any making good that is necessary at the time of decoration should be carried out in accordance with **F.2**.

F.1.2 Any filler that is used should be suitable for the end use and compatible with any finish that is to be applied.

F.1.3 Where a resin pocket is to be made good, the resin should be cut out or burnt out and the resulting cavity should be made good either with a filler suitable for the end use and for any finish that is to be applied, or with a plug complying with **5.4**.

NOTE Making good may be needed to repair unsound knots (see **4.2**), to fill shakes or checks (see **4.3**), to repair resin pockets (see **4.4**), or to repair deviations in machining (see **4.13**).

F.2 Extent of making good

NOTE There is no requirement in this Part of BS 1186 for any making good of defects in cases when surfaces of wood trim are not to receive a finish.

F.2.1 When sawn wood trim is to receive a finish, resin should be removed from resin pockets and the trim should be made good as described in **F.1**.

F.2.2 If the surface is planed or sanded, there should be no signs of break-out or tearing of grain.

F.2.3 When planed or sanded surfaces of wood trim are to receive an opaque finish, unsound knots, shakes or checks, and resin pockets, should be made good as described in **F.1**.

F.2.4 When planed or sanded surfaces of wood trim are to receive a non-opaque finish, it is recommended that the acceptability or otherwise of plugs and fillers, laminating and edge jointing, finger jointing or other joints in the length of wood trim be specified. If not specifically excluded, the supplier, fixer or decorator should be entitled to use such plugs, fillers and jointing methods in accordance with this Part of BS 1186.

NOTE 1 With most non-opaque finishes, it usually results in a more satisfactory appearance if small shakes and checks are left unfilled, because of the different absorption characteristics of filler and timber.

NOTE 2 See BS 6150.

Publications referred to

BS 476, *Fire tests on building materials and structures.*
BS 476-7, *Method for classification of the surface spread of flame of products.*
BS 1142, *Specification for fibre building boards.*
BS 1142-1, *Methods of test.*
BS 1142-2, *Medium board, medium density fibreboard (MDF) and hardboard.*
BS 1142-3, *Insulating board (softboard).*
BS 1186, *Timber for and workmanship in joinery.*
BS 1186-2, *Specification for workmanship.*
BS 4978, *Specification for softwood grades for structural use.*
BS 5589, *Code of practice for preservation of timber.*
BS 5669, *Particleboard.*
BS 5669-1, *Methods of sampling, conditioning and test.*
BS 5669-2, *Specification for wood chipboard.*
BS 5669-3, *Specification for waferboard and oriented strand board (OSB).*
BS 5669-4, *Specification for cement bonded particleboard.*
BS 5669-5, *Code of practice for the selection and application of particleboards for specific purposes.*
BS 6100, *Glossary of building and civil engineering terms.*
BS 6100-1, *General and miscellaneous.*
BS 6100-1.0, *General.*
BS 6100-4, *Forest products.*
BS 6100-4.1, *Characteristics and properties of timber and wood based panel products.*
BS 6100-4.2, *Sizes and quantities of solid timber.*
BS 6100-4.3, *Wood based panel products.*
BS 6100-4.4, *Carpentry and joinery.*
BS 6100-4.5, *Cork.*
BS 6150, *Code of practice for painting of buildings.*
BS 6566, *Plywood.*
BS 6566-1, *Specification for construction of panels and characteristics of plies including marking.*
BS 6566-2, *Glossary of terms.*
BS 6566-3, *Specification for acceptance levels for post-manufacture batch testing including sampling.*
BS 6566-4, *Specification for tolerances on the dimensions of plywood panels.*
BS 6566-5, *Specification for moisture content.*
BS 6566-6, *Specification for limits of defects for the classification of plywood by appearance.*
BS 6566-7, *Specification for classification of resistance to fungal decay and wood borer attack.*
BS 6566-8, *Specification for bond performance of veneer plywood.*
BS 7359, *Nomenclature of commercial timbers, including sources of supply.*
BS EN 942, *Timber in joinery — General classification of quality.*
A Handbook of Hardwoods (1972), Building Research Establishment, Garston, Watford, Herts.
A Handbook of Softwoods (1977), Building Research Establishment, Garston, Watford, Herts.
ABPVM (Association of British Plywood and Veneer Manufacturers) specification: BP 101:1985 25/35 City Road, London EC1Y 1AR.
BRE Technical Note No. 55, Damage by Ambrosia (pinhole borer) Beetle, Building Research Establishment, Garston, Watford, Herts WD2 7JR.

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