BRITISH STANDARD

BS 1187:1959

Incorporating
Amendment No. 1

Specification for

Wood blocks for floors

Co-operating organizations

The Timber Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

British Door Association
British Furniture Trade Confederation
British Railways, the British Transport Commission
British Wood Chipboard Manufacturers' Association
D.S.I.R. — Forest Products Research Laboratory*
English Joinery Manufacturers' Association (Incorporated)
Fibre Building Board Development Organization Ltd.
Flush Door Manufacturers' Association
Institution of Civil Engineers
Institution of Municipal Engineers
Institution of Structural Engineers
Ministry of Housing and Local Government
Ministry of Works
National Federation of Building Trades Employers
National Sawmilling Association
Royal Institute of British Architects*
Royal Institution of Chartered Surveyors
Timber Development Association*
Timber Trade Federation of the United Kingdom*

The Government department and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the Committee entrusted with the preparation of the standard.

Association of Flooring Contractors
Hardwood Flooring Manufacturers' Association
Incorporated Association of Architects & Surveyors

This British Standard, having been approved by the Timber Industry Standards Committee and endorsed by the Chairman of the Building Divisional Council, was published under the authority of the General Council on
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Contents

Foreword

This standard makes reference to the following British Standards and Code of Practice:

BS 350, *Conversion factors and tables.*

BS 565, *Glossary of terms applicable to timber, plywood and joinery.*

BS 881 & BS 589, *Nomenclature of commercial timbers including sources of supply.*

CP 201, *Flooring of wood and wood products — Part 1: Wood flooring (board, strip, block and mosaic).*

This standard makes available for architects and surveyors, builders and flooring contractors, information regarding minimum requirements for wood blocks for floors.

The choice of a species for wood blocks is influenced by consideration of cost, decorative properties, the nature of the wearing surface and its ability to stand up to the expected traffic conditions, and the stability of the timber.

Species of timber are available to meet the requirements of every type of traffic condition. Many hardwoods will withstand the heavy duty of industrial floors and where conditions are less exacting a wide range of woods will give excellent service. A large number of timbers is also available for the special floors in buildings where particular qualities in the species are required.

Problems concerning the suitability of various timbers to withstand different types and intensities of traffic are dealt with in detail in Forest Products Research Bulletin No. 40, "*Timbers for flooring*".[1)] This Bulletin includes an Appendix, reproduced at the end of the standard, which classifies hardwoods and softwoods in various groups according to the conditions of service or application as a floor. This classification of timbers does not mean that they are necessarily available commercially or that other timbers not specifically mentioned are unsuitable. There are many hundreds of different species of timber many of which are very suitable for flooring and it would be impractical to list them all.

It cannot be emphasized too strongly that no wood flooring block will give satisfactory service unless it is laid in accordance with good practice. A Code of Practice, CP 201, "*Flooring of wood and wood products*", Part 1, "*Wood flooring (board, strip, block and mosaic)*", makes recommendations on methods of laying.

Several novel types of wood flooring are available, some as thin as ⅜ in. (10 mm), but complete standardization of these blocks is impracticable because of the varying techniques of manufacture, some of which are the subject of British patents. It is considered desirable, however, that these types of flooring should conform to this British Standard insofar as it can be applicable to them.

NOTE Where metric equivalents have been given the figures in British units are to be regarded as the standard. The metric conversions are approximate. More accurate conversions should be based on the Tables in BS 350.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 7 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)] Obtainable from H.M. Stationery Office.

1 Scope

This British Standard relates the hardwood and softwood blocks excluding end grain blocks for laying on level concrete or other types of rigid level bases, and specifies the minimum requirements for dimensions, grade descriptions, and methods of manufacture. It includes an Appendix taken from the Forest Products Research Laboratory Bulletin No. 40, "Timbers for flooring", giving a list of suitable timbers for manufacture of wood blocks for different applications.

2 Definitions and nomenclature

The definitions of the terms used in this British Standard are given in BS 565, "*Glossary of terms applicable to timber, plywood and joinery*", and the nomenclature conforms to BS 881 and 589, "*Nomenclature of commercial timbers, including sources of supply*".

3 Grade — description

a) **Hardwoods.** Hardwood blocks shall be free from all signs of decay and insect attack except for pinholes to the extent specified below, and shall have the face free from all defects. Occasional pin knots and bright sapwood are not considered defects.

b) **Softwoods.** Softwood blocks shall be free from all signs of decay and insect attack, except for pinholes to the extent specified below, and shall have the face free from all defects. Occasional tight sound knots, with the overall dimension of the knot measured across the width of the face of the block (i.e., the width between lines touching the knot and parallel to the edges of the block) not greater than ¾ in. (19 mm), and bright sapwood are not considered defects.

On the back of any wood blocks defects other than decay and insect attack shall be permitted, provided they do not impair the fitting of the interlocking system or the laying of the floor.

Pinholes in both hardwoods and softwoods not greater than $^{1}/_{16}$ in. (1.6 mm) in diameter shall be permitted, provided that they are not closely clustered and also that only 20 per cent of the piece or 25 per cent of the parcel is affected. (The pin-worm is a borer which cannot live in timber after the tree is felled and dried.)

Colour variation in both hardwood and softwood blocks shall be permitted.

4 Manufacture

Hardwood and softwood blocks shall be free from any of the defects due to manufacturing defined in BS 565.[2)]

An interlocking method of jointing such as the tongue and groove shall be used.

A chamfer or groove shall be machined along the bottom of both longitudinal edges of the wood block to take up surplus adhesive.

5 Dimensions

The dimensions of the wood block at the time of delivery shall conform to the following:

a) The finished thickness shall be not less than $^{13}/_{16}$ in. (21 mm) with a clear wearing thickness of not less than $^{3}/_{8}$ in. (10 mm) above the interlocking system.

b) The maximum width of face shall not exceed $3^{1}/_{2}$ in. (89 mm).

c) The length shall be not less than 6 in. (152 mm) nor more than 15 in. (381 mm).

The more common lengths are within the range 9 in. (229 mm) to 12 in. (305 mm).

d) Any one package or bundle shall contain wood blocks of a single species, thickness, width, length and type of manufacture only.

6 Moisture content

The moisture content of hardwood and softwood blocks shall be adjusted to suit the conditions under which the building is ultimately to be used. It is essential that the average conditions of temperature and humidity in the building before, during and after laying, shall approximate to those which prevail or will prevail during occupation. The ranges of moisture content are given in the following table:

Type of heating	Ranges of moisture content at time of delivery
Intermittent heating	12 to 15 per cent.
Continuous heating	9 to 12 per cent.
Under-floor heating[a]	6 to 10 per cent.
[a] Not suitable for softwood flooring.	

NOTE Where heating panels are embedded in the floors or ceilings it is necessary to kilndry wood blocks to a moisture content lower than the minimum of the lowest range given above.

[2)] BS 565, *"Glossary of terms applicable to timber, plywood and joinery*

7 Rate of growth

The requirements for rate of growth considerations apply only to softwood blocks. The number of growth rings, seen on the cross-section of the wood blocks, on a line 1 in. (25 mm) in length perpendicular to the direction of the rings, shall be not less than six nor more than twenty, unless the material contains more than one-third of summerwood (the dark portion of the growth ring).

If a 1 in. line cannot be obtained on the cross-section the measurements shall be made over as long a line as possible.

Appendix Hardwoods and softwoods suitable for use as flooring

Department of Scientific and Industrial Research, Forest Products Research

Appendix to Bulletin No. 40

Timbers for flooring

The hardwoods and softwoods listed in this Appendix are recommended as being suitable for use as flooring, mainly in wood strip, wood block, or board form, but not as end-grain blocks. The list is not exhaustive and the omission of any particular species of timber does not imply that it is necessarily unsuitable for flooring. On the other hand the inclusion of a timber in the list does not imply that it is always readily available on the market. Those timbers mentioned as especially suited to particular conditions of service can be used under other conditions when they possess the necessary qualifications. Some species have therefore been included in one or more groups. It should be appreciated, however, that the various timbers indicated as suitable for any particular service conditions may not all be equally suitable in every aspect.

I. The floor for pedestrian traffic

a) *Heavy Traffic*

Intensities of 2 000 persons per day and upwards, usually concentrated in definite traffic lanes, as in public institutions, barracks, industrial canteens, corridors in large schools, colleges, etc.

Timber[a]	Weight[b]	Timber	Weight
Afina (*Strombosia postulata*)	57	Missanda (*Erythrophleum guineense* and *E. ivorensis*)	56
African padauk (*Pterocarpus soyauxii*)	48	Mora (*Mora excelsa*)	64
Banga wanga (*Amblygonocarpus obtusangulus*)	62	Mfunda (*Cynometna webberi*)	61
Bubinga (*Guibourtia demeusei*)	50	Mugonha (*Adina microcephala*)	55
Burma padauk (*Pterocarpus macrocarpus*)	52	Mugonyone (*Apodytes dimidiata*)	53
Danta (*Nesogordonia papaverifera*)	47	Muhimbi (*Cynometra alexandri*)	54
East African olive (*Olea hochstetteri*)	55	Muhuhu (*Brachylaena hutchinsii*)	60
European beech (*Fagus sylvatica*)	43	Nkunya (*Manilkara cuneifolia*)	65
European oak (*Quercus robur* and *Q. petraea*)	44	Panga panga (*Millettia stuhlmanii*)	50
Guarabu (*Astronium* spp.)	49	Pillarwood (*Cassipourea elliottii*)	46
Haldu/kwao (*Adina cordifolia*)	42	Purpleheart (*Peltogyne* spp.)	54
Hornbeam (*Carpinus betulus*)	46	Pyinkado (*Xylia dolabriformis*)	58
Japanese maple (*Acer* spp.)	44	Rhodesian copalwood (*Guibourtia coleosperma*)	50
Loliondo (*Olea welwitschii*)	50	“Rhodesian teak” (*Baikiaea plurijuga*)	57
Makarati (*Burkea africana*)	61	Rock maple (*Acer saccharum*)	46
Malayankeruing (*Dipterocarpus* spp.)	49	Serrette (*Byrsonima spicata*)	44
		Spotted gum (*Eucalyptus maculata*)	60

[a] Standard name and botanical species. The majority of these are taken from BS 881 and BS 589: “*Nomenclature of Commercial Timbers*”.

[b] Approximate weight in lb per cu. ft at 12 per cent moisture content.

b) *Normal Traffic*

Intensities less than 2 000 persons per day, as experienced in village and assembly halls, school and college classrooms, hospitals, hotels, canteens, offices, shops, etc.

Timber	Weight	Timber	Weight
Species under a) with		Malayan kapur/North Borneo kapur	
African celtis (*Celtis* spp.)	49	(*Dryobalanops* spp.)	48/44
Afrormosia (*Afrormosia elata*)	46	Mengkulang (*Tarrietia* spp.)	44
Afzelia (*Afzelia* spp.)	47	Merbau (*Intsia bijuga*)	48
American pitch pine (*Pinus palustris* and		Mersawa/krabak (*Anisoptera* spp.)	39
P. elliottii) mainly rift-sawn	41	Muninga (*Pterocarpus angolensis*)	41
Apitong (*Dipterocarpus* spp.)	43	Musine (*Croton megalocarpus*)	44
Ayan (*Distemonanthus benthamianus*)	42	Okwen (*Brachystegia nigerica*)	42
Dark red meranti/dark red seraya		Opepe (*Sarcocephalus diderrichii*)	47
(*Shorea* spp.)	43	Ramin (*Gonystylus* spp.)	41
Grevillea (African silky-oak)(*Grevillea*		Sapele/utile (*Entandrophragma* spp.)	40/40
robusta)	35	Selangan batu (*Hopea* spp. and	
Guarea (*Guarea* spp.)	38	*Shorea* spp.)	54/59
Gurjun (*Dipterocarpus* spp.)	44/46	Sepetir (*Pseudosindora palustris*)	41
Iroko (*Chlorophora excelsa*)	41	"Tasmanian myrtle" (*Nothofagus*	
Jarrah (*Eucalyptus marginata*)	54	*cunninghamii*)	37
Karri (*Eucalyptus diversicolor*)	57	Teak (*Tectona grandis*)	43
Kempas (*Koompassia malaccensis*)	54	Yang (*Dipterocarpus* spp.)	44
Keruing (*Dipterocarpus* spp.)	50	Yellow birch (*Betula alleghaniensis*)	43
Makoré (*Mimusops heckelii*)	38		

c) *Light Traffic*

The floors in residential and domestic buildings, flats, small classrooms, small offices.

Timber	Weight	Timber	Weight
Species in a) and b) with		Light red meranti/light red seraya	
Abura (*Mitragyna ciliata*)	34	(*Shorea* spp.)	33
Afara (*Terminalia superba*)	31	Manio (*Podocarpus* spp.)	32
African mahogany (*Khaya* spp.)	31	Niangon (*Tarrietia utilis*)	39
"African walnut" (*Lovoa klaineana*)	34	Matai (*Podocarpus spicata*)	38
Agba (*Gossweilerodendron balsamiferum*)	31	"Parana pine" (*Araucaria angustifolia*)	33
Dahoma (*Piptadenia africana*)	43	Podo (*Podocarpus* spp.)	32
"Douglas fir" (*Pseudotsuga taxifolia*)	31	Redwood/Scots pine (*Pinus sylvestris*)	30
East African camphorwood		Saligna gum (*Eucalyptus saligna*)	47
(*Ocoteausambarensis*)	37	"Tasmanian oak" (*Eucalyptus* spp.)	42
European birch (*Betula* spp.)	42	Western hemlock (*Tsugaheterophylla*)	30
Gedu nohor (*Entandrophragma* spp.)	32	White seraya (*Parshorea plicata*)	33
Idigbo (*Terminalia ivorensis*)	34	Yellow meranti/yellow seraya	
		(*Shorea* spp.)	40

II. The decorative floor

The floor of high quality, selected material in residential buildings, hotel rooms, offices and boardrooms, showrooms, etc.

Timber	Weight	Timber	Weight
Afrormosia (*Afrormosia elata*)	46	Guarabu (*Astronium* spp.)	49
"African walnut" (*Lovoa klaineana*) mainly rift-sawn	34	Muhimbi (*Cynometra alexandri*)	54
African padauk (*Pterocarpus soyauxii*)	40	Muhuhu (*Brachylaena hutchinsii*)	60
Andaman padauk (*Pterocarpus dalbergioides*)	49	Muninga (*Pterocarpus angolensis*)	41
Burma padauk (*Pterocarpus macro-carpus*)	53	Panga panga (*Millettia stuhlmannii*)	50
East African olive (*Olea hochstetteri*)	55	Purpleheart (*Peltogyne* spp.)	54
European oak (*Quercus robur* and *Q. petraea*) selected, quartered material	44	Pyinkado (*Xylia dolabriformis*)	58
Gedu nohor (*Entandrophragma angolense*) selected, quartered material.	34	Rhodesian copalwood (*Guibourtia coleosperma*)	50
Grevillea/African silky-oak (*Grevillea robusta*)	35	"Rhodesian teak" (*Baikiaea plurijuga*)	57
		Sapele (*Entandrophragmacylindricum*) selected, quartered material	40
		Yew (*Taxus baccata*)	38

III. The industrial floor

a) *Heavy Duty*

Exceptionally severe traffic including trucking and other impact load as in factories, mills, sorting sheds, workshops, warehouses, etc.

Timber	Weight	Timber	Weight
Banga wanga (*Amblygonocarpus obtusangulus*)	62	Muhimbi (*Cynometra alexandri*)	54
Billian (*Eusideroxylon zwageri*)	64	Muhuhu (*Brachylaena hutchinsii*)	60
Bubinga (*Guibourtia* spp.)	54	Nkunya (*Manilkara cuneifolia*)	65
Brush box (*Tristania conferta*)	58	Okan (*Cylicodiscus gabunensis*)	65
East African olive (*Olea hochstetteri*)	55	Pillarwood (*Cassipourea elliottii*)	48
Greenheart (*Ocotea rodiaei*)	65	Pyinkado (*Xylia dolabriformis*)	58
Japanese maple (*Acer* spp.)	44	"Rhodesian teak" (*Baikiaea plurijuga*)	57
Mfunda (*Cynometra webberi*)	61	Rock maple (*Acer saccharum*)	46
		Wallaba (*Eperua falcata*)	52

b) *Light Duty*

Traffic as in clothing and food processing and other industrial establishments with trucking of a light nature.

Timber	Weight	Timber	Weight
Hardwoods under a) with			
Danta (*Nesogordonia papaverifera*)	47	Mugonyone (*Apodytes dimidiata*)	53
European beech (*Fagus sylvatica*)	45	Rapanea (*Rapanea* spp.)	55
Haldu/kwao (*Adina cordifolia*)	42	Sepetir (*Pseudosindora palustris*)	45
Loliondo (*Olea welwitschii*)	50	Serrette (*Byronima spicata*)	44
Missanda (*Erythrophleum guineense* and *E. ivorensis*)	57	Tallowwood (*Eucalyptus microcorys*)	63
Mora (*Mora excelsa*)	62	"Tasmanian myrtle" (*Nothofagus cunninghamii*)	42
Mugonha (*Adina microcephala*)	55	Yellow birch (*Betula alleghaniensis*)	43

IV. Floors for special purposes

a) *High Impermeability to Chemicals and Acids*

Floors in science laboratories, etc.

Timber	Weight	Timber	Weight
Afrormosia (*Afrormosia elata*)	46	Karri (*Eucalyptus diversicolor*)	57
Afzelia (*Afzelia* spp.)	47	Kempas (*Koompassia malaccensis*)	54
Burma padauk (*Pterocarpus dalbergioides*)	45	Keruing (*Dipterocarpus* spp.)	50
East African camphorwood (*Ocoteausambarensis*)	37	Malayan kapur (*Dryobalanops* spp.)	48
European oak (*Quercus robur* and *Q. petraea*)	44	Mora (*Mora excelsa*)	62
Gurjun (*Dipterocarpus* spp.)	46	Opepe (*Sarcocephalus diderrichii*)	47
Iroko (*Chlorophora excelsa*)	41	Purpleheart (*Peltogyne* spp.)	54
Jarrah (*Eucalyptus marginata*)	54	Pyinkado (*Xylia dolabriformis*)	58
		"Rhodesian teak" (*Baikiaea plurijuga*	57
		Spotted gum (*Eucalyptus maculata*)	60
		Tallowwood (*Eucalyptus microcorys*)	63

b) *Small "Movement"*[3)]

i) *Where industrial processes involving wide variations in temperature and humidity are carried out*

Timber	Weight	Timber	Weight
Banga wanga (*Amblygonocarpus obtusangulus*)	62	Muhuhu (*Brachylaena hutchinsii*)	54
Loliondo (*Olea welwitschii*)	50	Panga panga (*Millettia stuhlmannii*)	50
Missanda (*Erythrophleum guineense* and *E. ivorensis*)	56	"Rhodesian teak" (*Baikiaea plurijuga*)	57

ii) *For residential and other buildings with floor panel heating*

Timber	Weight	Timber	Weight
Hardwoods under i) with		Gedu nohor (*Entandrophragma angolense*)	34
Abura (*Mitragyna ciliata*)	34	Guarea (*Guarea* spp.)	38
African mahogany (*Khaya* spp.)	31	Iroko (*Chlorophora excelsa*)	41
Afrormosia (*Afrormosia elata*)	46	Makoré (*Mimusops heckelii*)	38
Afzelia (*Afzelia* spp.)	51	Muninga (*Pterocarpus angolensis*)	41
Agba (*Gossweilerodendron balsamiferum*)	31	Opepe (*Sarcocephalus diderrichii*)	47
Ayan (*Distemonanthus benthamianus*)	42	Teak (*Tectona grandis*)	43
East African camphorwood (*Ocoteausambarensis*)	37		

[3)] Small dimensional changes with atmospheric conditions.

c) *The Gymnasium Floor*

Timber	Weight	Timber	Weight
Ayan (*Distemonanthus benthamianus*)	42	Japanese maple (*Acer* spp.)	44
Danta (*Nesogordonia papaverifera*)	46	Loliondo (*Olea welwitschii*)	50
"Douglas fir" (*Pseudotsuga taxifolia*)		Muninga (*Pterocarpus angolensis*)	41
rift-sawn only	31	Pillarwood (*Cassipourea elliotii*)	46
East African olive (*Olea hochstetteri*)	55	Rock maple (*Acer saccharum*)	46
European beech (*Fagus sylvatica*)		"Tasmanian oak" (*Eucalyptus* spp.)	42
rift-sawn only	43	Western hemlock (*Tsugaheterophylla*)	
Guarea (*Guarea* spp.)	38	rift-sawn only	30
Gurjun/keruing (*Dipterocarpus* spp.)	46/50	White seraya (*Parashorea plicata*)	33
Haldu/kwao (*Adina cordifolia*)	42	Yellow birch (*Betula alleghaniensis*)	43
Japanese beech (*Fagus* spp.) rift-sawn only	38		

d) *The Ballroom Floor*

Timber	Weight	Timber	Weight
Danta (*Nesogordonia papaverifera*)	46	Muhimbi (*Cynometra alexandrii*)	54
East African olive (*Olea hochstetteri*)	55	Pillarwood (*Cassipourea elliottii*)	48
European oak (*Quercus robur* and		"Rhodesian teak" (*Baikiaea plurijuga*)	57
Q. petraea)	44	Rock maple (*Acer saccharum*)	46
Haldu/kwao (*Adina cordifolia*)	42	Sapele/gedunohor (*Entandrophragma*	
Guarea (*Guarea* spp.)	38	spp.)	40/32
Japanese maple (*Acer* spp.)	44	Yellow birch (*Betula alleghaniensis*)	43
Loliondo (*Olea welwitschii*)	50		

e) *The Skating Rink Floor*

Timber	Weight	Timber	Weight
Brush box (*Tristania conferta*)	58	Nkunya (*Manilkara cuneifolia*)	65
East African olive (*Olea hochstetteri*)	55	Rock maple (*Acer saccharum*)	46
Japanese maple (*Acer* spp.)	44	Tallowwood (*Eucalyptus microcorys*)	63
Mugonyone (*Apodytes dimidiata*)	53		

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