BS EN 13228:2011

BSI Standards Publication

Wood flooring — Solid wood overlay flooring elements including blocks with an interlocking system

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National foreword

This British Standard is the UK implementation of EN 13228:2011. It supersedes BS EN 13228:2002 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/543, Round and sawn timber.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 69221 5

ICS 79.080

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2011.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13228

May 2011

ICS 79.080

Supersedes EN 13228:2002

English Version

Wood flooring - Solid wood overlay flooring elements including blocks with an interlocking system

Plancher en bois - Eléments de parquets en bois massifs de recouvrement, blocs anglais compris, avec systèmes de guidage

Holzfußböden - Massivholz-Overlay-Parkettstäbe einschließlich Parkettblöcke mit einem Verbindungssystem

This European Standard was approved by CEN on 14 April 2011.

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 13228:2011) has been prepared by Technical Committee CEN/TC 175 “Round and sawn timber”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2011, and conflicting national standards shall be withdrawn at the latest by November 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13228:2002.

In this European Standard the Annex A is informative and Annex B is normative.

Compared with EN 13228:2002, the following modifications have been made:

a) Modification of the 2nd sentence of the scope;

b) Modification of dimensional characteristics of overlay flooring element (5.4.2.2);

c) Editorial modification on row 7 of Table 8 of 5.4.4.1;

d) Modification of limit deviation of cup (5.4.4.3), bow (5.4.4.4), spring (5.4.4.5);

e) Deletion of "specific site requirements" (5.5.2);

f) Updating of Clause 2 "Normative references" and bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This standard is one of a series of standards about wood flooring and wood panelling and cladding.

This standard specifies the characteristics of solid wood flooring elements. It is based upon current dimensional standards used in the industry and other characteristics together with functions which have been verified by test.

A large amount of knowledge exists about solid wood flooring elements and values for product characteristics are attested by long use and experience. It is therefore not necessary to have test results. For new products technical data will have to be verified by testing.

The appearance of the wood flooring is mainly influenced by species, classification and the pattern.

1 Scope

This European Standard specifies the characteristics of solid wood overlay flooring including blocks with an interlocking system for internal use as flooring. It applies to elements.

This standard covers elements with and without surface coating.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 844-1:1995, *Round and sawn timber — Terminology — Part 1: General terms common to round timber and sawn timber*

EN 844-3:1995, *Round and sawn timber — Terminology — Part 3: General terms relating to sawn timber*

EN 844-4:1997, *Round and sawn timber — Terminology — Part 4: Terms relating to moisture content*

EN 844-6:1997, *Round and sawn timber — Terminology — Part 6: Terms relating to dimensions of sawn timber*

EN 844-9:1997, *Round and sawn timber — Terminology — Part 9: Terms relating to features of sawn timber*

EN 844-10:1998, *Round and sawn timber — Terminology — Part 10: Terms relating to stain and fungal attack*

EN 844-11:1998, *Round and sawn timber — Terminology — Part 11: Terms relating to degrade by insects*

EN 844-12:2000, *Round and sawn timber — Terminology — Part 12: Additional terms and general index*

EN 1310:1997, *Round and sawn timber — Method of measurement of features*

EN 1311, *Round and sawn timber — Method of measurement of biological degrade*

EN 1534, *Wood flooring — Determination of resistance to indentation — Test method*

EN 13183-1, *Moisture content of a piece of sawn timber — Part 1: Determination by oven dry method*

EN 13183-2, *Moisture content of a piece of sawn timber — Part 2: Estimation by electrical resistance method*

EN 13647, *Wood flooring and wood panelling and cladding — Determination of geometrical characteristics*

EN 13756:2002, *Wood flooring — Terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 844-1:1995, EN 844-3:1995, EN 844-4:1997, EN 844-6:1997, EN 844-9:1997, EN 844-10:1998, EN 844-11:1998, EN 844-12:2000 and in EN 13756:2002 and the following apply:

3.1
block
element with an interlocking system

NOTE It is defined by the relevant dimensional limits in 5.4.3 and Tables 7 and 8.

3.2
overlay flooring element
element with an interlocking system with a thickness which renders it suitable for laying on a continuous supporting surface

[EN 13756:2002]

3.3
interlocking system
system of assembly based upon a male and a female profile that does not have a load-bearing function, allowing the positioning of elements during installation

[EN 13756:2002]

3.4
thickness above the groove
thickness between the face and any discontinuity such as a change in the profile (excluding chamfering), a groove/glue pocket or a glue line (excluding the glue line of finger-joints)

[EN 13756:2002]

4 Symbols and abbreviations

L Length of the face of the element

b Width of the face of the element

b_1 Depth of the female profile

b_2 Width of the male profile

b_3 Undercut

t Thickness between the face and the back of the element

t_1 Thickness above the groove

t_2 Width of the female profile

t_3 Thickness of the male profile

t_4 Thickness of the part below the male profile

α Angle that an edge makes to a plane normal to adjacent face, in degrees

5 Specific product requirements

5.1 Wood species

A list of the most commonly used species for wood flooring elements as described in this standard is given in Annex A.

5.2 Appearance

5.2.1 General rules

Tables 1 to 6 define the classification relating to appearance rules for the face and for the non-visible parts (back and edges) of an element of the most commonly used species for solid wood flooring as defined in this standard.

Features shall be measured according to EN 1310 (knots assessed according to the general method of 4.1 in EN 1310:1997). Bio deterioration is measured according to EN 1311.

A classification with three appearance classes is specified, designated ○, △ and □.

A classification named "Free class" is based on the principles laid out in Annex B.

To allow for unavoidable classification differences, 3 % of the strips in a batch may be other classes. Any additional strips from other classes are allowed as long as the general impression of the floor is not disturbed.

The face shall include all the visible surface of the element. It shall therefore extend to the chamfering[1)] if any.

The face shall be free from shake and the wood shall be sound.

Any continuous glue joint which allows renovation without significantly changing the appearance or the functional characteristics is acceptable.

1) The chamfering is visible when elements are assembled.

5.2.2 Rules for the most commonly used species

5.2.2.1 *Quercus* spp. (oak)

Rules for oak are given in Table 1.

Table 1 — Classification for *Quercus* spp. (oak)

Face of the element			
Features	**Class**		
	○	Δ	□
Sound sapwood	Not permitted	Permitted	Slight traces permitted
Knots Sound and intergrown Unsound knots	Permitted if: diameter ≤ 2 mm Not permitted	Permitted if: diameter ≤ 5 mm diameter ≤ 3 mm	Permitted if: diameter ≤ 15 mm diameter ≤ 10 mm
Checks	Not permitted	Permitted up to 15 mm in length	All features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring.
Bark pockets	Not permitted	Not permitted	
Lightning shake	Not permitted	Not permitted	
Slope of grain	Permitted, no limit	Permitted, no limit	
Colour variation	Slight variation permitted	Permitted [a]	
Medullary ray	Permitted	Permitted	
Biodeterioration	Not permitted	Not permitted	Not permitted, except blue stain and black holes
Non-visible parts			
All features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring. Sound sapwood is permitted from the back up to the upper part of the male profile of the interlocking system without taking into account the limits set for the face.			

[a] Brown oak.

5.2.2.2 *Fraxinus excelsior* (European ash) and *Acer* spp. (maple)

Rules for European ash and maple are given in Table 2.

Table 2 — Classification for *Fraxinus excelsior* (European ash) and *Acer* spp. (maple)

Face of the element			
Features	**Class**		
	○	Δ	□
Sound sapwood	Not applicable	Not applicable	Not applicable
Knots	Permitted if:	Permitted if:	Permitted if:
Sound and intergrown			
b < 70 mm	diameter ≤ 2 mm	diameter ≤ 5 mm	diameter ≤ 15 mm
b ≥ 70 mm	diameter ≤ 3 mm	diameter ≤ 10 mm	diameter ≤ 30 mm
Unsound knots	Not permitted	diameter ≤ 3 mm	diameter ≤ 10 mm
Checks	Not permitted	Not permitted	Not permitted
Bark pockets	Not permitted	Not permitted	Not permitted
Lightning shake	Not permitted	Not permitted	Not permitted
Slope of grain	Permitted, no limit	Permitted, no limit	Permitted, no limit
Colour variation	Slight variation permitted. Slight traces of natural discoloration (mineral lines) permitted.	Permitted	Permitted
Stick marks	Not permitted	Permitted	Permitted
Biodeterioration	Not permitted	Not permitted	Not permitted, except blue stain and black holes
Non-visible parts			
All features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring.			

5.2.2.3 *Fagus sylvatica* (European beech)

Rules for European beech are given in Table 3.

Table 3 — Classification for *Fagus sylvatica* (European beech)

Face of the element			
Features	**Class**		
	○	Δ	□
Sound sapwood	Not applicable	Not applicable	Not applicable
Knots	Permitted if:	Permitted if:	Permitted if:
Sound and intergrown			
b < 70 mm	diameter ≤ 2 mm	diameter ≤ 5 mm	diameter ≤ 15 mm
b ≥ 70 mm	diameter ≤ 3 mm	diameter ≤ 10 mm	diameter ≤ 30 mm
Unsound knots	Not permitted	diameter ≤ 3 mm	diameter ≤ 10 mm
Checks	Not permitted	Not permitted	Not permitted
Bark pockets	Not permitted	Not permitted	Not permitted
Lightning shake	Not permitted	Not permitted	Not permitted
Slope of grain	Permitted, no limit	Permitted, no limit	Permitted, no limit
Colour variation	Slight variation permitted [a]. Slight traces of natural discoloration permitted.	Permitted	Permitted
Red heart	Not permitted	Permitted	Permitted
Stick marks	Not permitted	Permitted	Permitted
Medullary ray	Permitted	Permitted	Permitted
Biodeterioration	Not permitted	Not permitted	Not permitted, except blue stain and black holes
Non-visible parts			
All features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring.			

[a] Permitted for steamed beech.

5.2.2.4 *Betula* spp. (birch)

Rules for birch are given in Table 4.

Table 4 — Classification for *Betula* spp. (birch)

Face of the element			
Features	**Class**		
	○	Δ	□
Sound sapwood	Not applicable	Not applicable	Not applicable
Knots	Permitted if:	Permitted if:	Permitted if:
Sound and intergrown			
b < 70 mm	diameter ≤ 2 mm	diameter ≤ 5 mm	diameter ≤ 15 mm
b ≥ 70 mm	diameter ≤ 3 mm	diameter ≤ 10 mm	diameter ≤ 30 mm
Unsound knots	Not permitted	diameter ≤ 3 mm	diameter ≤ 10 mm
Checks	Not permitted	Not permitted	Not permitted
Bark pockets	Not permitted	Not permitted	Not permitted
Lightning shake	Not permitted	Not permitted	Not permitted
Slope of grain	Permitted, no limit	Permitted, no limit	Permitted, no limit
Biodeterioration	Not permitted	Not permitted	Not permitted, except blue stain and black holes
Stick marks	Not permitted	Permitted	Permitted
Colour variation	Slight variation permitted. Slight traces of natural discoloration and mineral lines permitted.	Permitted	Permitted
Non-visible parts			
All features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring.			

5.2.2.5 *Castanea sativa* spp. (sweet chestnut)

Rules for sweet chestnut are given in Table 5.

Table 5 — Classification for *Castanea sativa* spp. (sweet chestnut)

Face of the element			
Features	**Class**		
	○	Δ	□
Sound sapwood	Not permitted	Not permitted	Slight traces permitted
Knots	Permitted if:	Permitted if:	Permitted if:
Sound and intergrown			
b < 70 mm	diameter ≤ 2 mm	diameter ≤ 5 mm	diameter ≤ 15 mm
b ≥ 70 mm	diameter ≤ 3 mm	diameter ≤ 10 mm	diameter ≤ 30 mm
Unsound knots	diameter ≤ 1 mm	diameter ≤ 3 mm	diameter ≤ 10 mm
Yellow stain	Not permitted	50 % permitted	Permitted
Checks	Not permitted	Permitted when the length ≤ width of the element	Permitted when the length ≤ 50 % of the length of the element
Bark pockets	Not permitted	Not permitted	Permitted
Lightning shake	Not permitted	Not permitted	Permitted
Slope of grain	Permitted, no limit	Permitted, no limit	Permitted, no limit
Colour variation	Slight variation permitted.	Permitted	Permitted
Biodeterioration	Not permitted	Not permitted	Not permitted
Non-visible parts			
All features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring. Sound sapwood is permitted up to 50 % of the thickness.			

5.2.2.6 Other hardwoods

Rules for other hardwoods are given in Table 6.

Table 6 — Classification for other hardwoods

Face of the element			
Features	**Class**		
	○	Δ	□
Sound sapwood	Not permitted	Permitted	Slight traces permitted
Knots Sound and intergrown Unsound knots	Permitted if: diameter ≤ 2 mm if not grouped together [a] diameter ≤ 1 mm if not grouped together [a]	Permitted if: diameter ≤ 5 mm if not grouped together [a] diameter ≤ 2 mm if not grouped together [a]	All features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring.
Checks	Not permitted	Not through going. Permitted if the width ≤ 0,5 % of the width of the element.	
Bark pockets	Not permitted	Not permitted	
Lightning shake	Not permitted	Not permitted	
Slope of grain	Permitted, no limit	Permitted, no limit	
Colour variation	Permitted. Slight traces of natural discoloration and mineral lines permitted.	Permitted	
Medullary ray	Permitted	Permitted	
Biodeterioration	Not permitted	Not permitted	Not permitted, except blue stain and black holes
Non-visible parts			
All features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring. In class ○ sound sapwood is permitted if in a corner and up to 50 % of the thickness of the element.			

[a] Knots are grouped together if the distance separating them, measured from edge to edge, does not exceed 30 mm.

5.2.3 Free class

The free class covers any species which may be used for wood flooring and for which hardness HB has a minimum mean value of 10 N/mm^2. Hardness shall be measured according to EN 1534. The free class covers any classification which the producer wishes to offer or which is requested by the buyer. The proportions or limits of features shall be specifically indicated in the manufacturer's literature/data sheets, in conformity with Annex B and stated according to Table B.1 when it refers to hardwood and according to Table B.2 when it refers to softwood.

NOTE 10 N/mm^2: approximately 1 kgf/mm^2

5.2.4 Natural colours

Timber colours are mainly dependent on the wood species.

NOTE All timber varies in colour when exposed to light over a period of time.

5.3 Moisture content

Individual elements shall have a moisture content at the time of the first delivery of the product of between 7 % and 11 %. Chestnut elements shall have a moisture content at the time of the first delivery of the product of between 7 % and 13 %.

The moisture content shall be measured with an electric moisture meter in accordance with EN 13183-2. In case of dispute, the moisture content shall be determined by oven-drying in accordance with EN 13183-1.

5.4 Geometrical characteristics

5.4.1 General

All forms of elements are permitted, provided that their actual dimensions are within the dimensions and permitted deviations specified in this subclause.

All dimensions are given at a reference moisture content of 9 % except dimensions for chestnut elements which are given at a reference moisture content of 10 %.

Unless there is evidence to the contrary, it shall be assumed that the thickness and width of a piece of timber increase by 0,25 % for every 1 % of moisture content above the reference moisture content, and decrease by 0,25 % for every 1 % of moisture content below the reference moisture content.

The methods of measurement of geometrical characteristics are given in EN 13647.

5.4.2 Profile

5.4.2.1 Block

Figure 1 shows the profile of a block, Table 7 shows the range of dimensions and Table 8 the limit deviations for the dimensions.

The dimensional characteristics are as follows:

$b_1 - b_2 \geq 1$ mm ;

$b_2 \geq 2{,}5$ mm ;

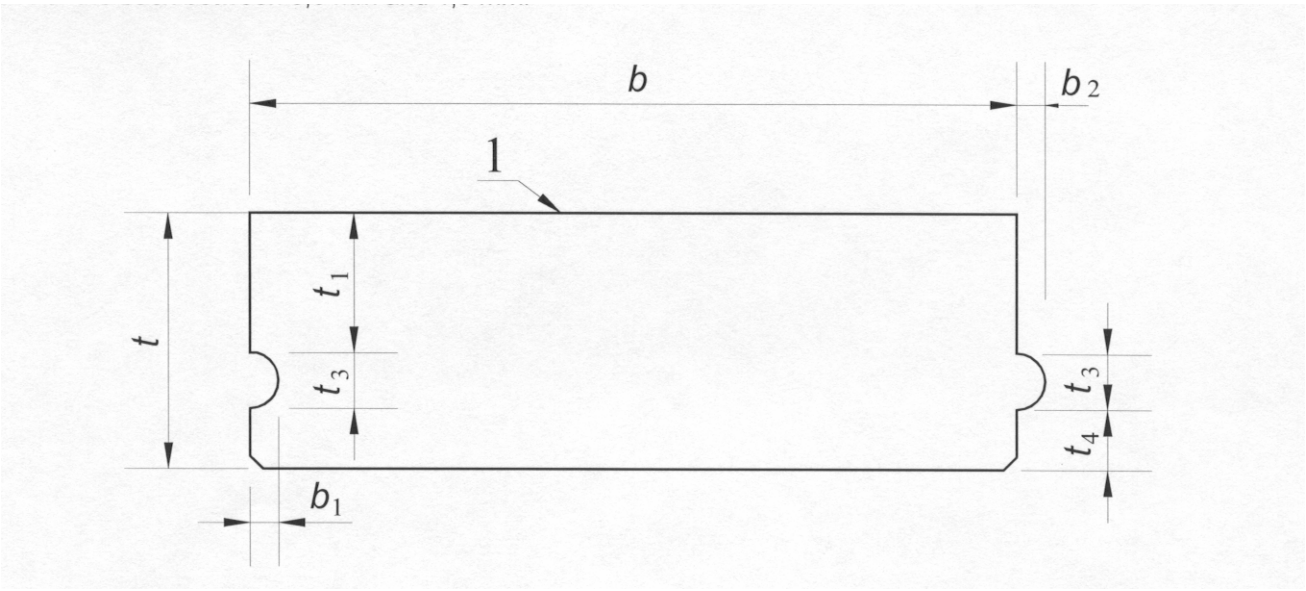
$t_4 \leq 2{,}5$ mm ;

$t_1 \geq 35$ % of t ;

$t_4 \geq 22$ % of t .

There shall be a minimum clearance of 0,25 mm at all points between the male and female profile of the interlocking system.

A chamfer or female profile shall be machined along the base of both longitudinal edges of the block to take up surplus adhesive with a minimum of 0,5 mm and a maximum of 1,5 mm. The edges shall have a negative slope from the face to the back between 0,5 mm and 1,5 mm.



Key

1 Face

Figure 1 — Profile of a block

5.4.2.2 Overlay flooring element

Figure 2 shows the profile of an overlay flooring element, Table 7 shows the range of dimensions and Table 8 the limit deviations for the dimensions.

The dimensional characteristics are as follows:

$b_1 - b_2 \geq 1$ mm ;

$b < 70$ mm, $b_2 \geq 3$ mm ; $b \geq 70$ mm, $b_2 \geq 5$ mm

$b_3 \leq 1{,}5$ mm ;

$t_1 \geq 35$ % of t ;

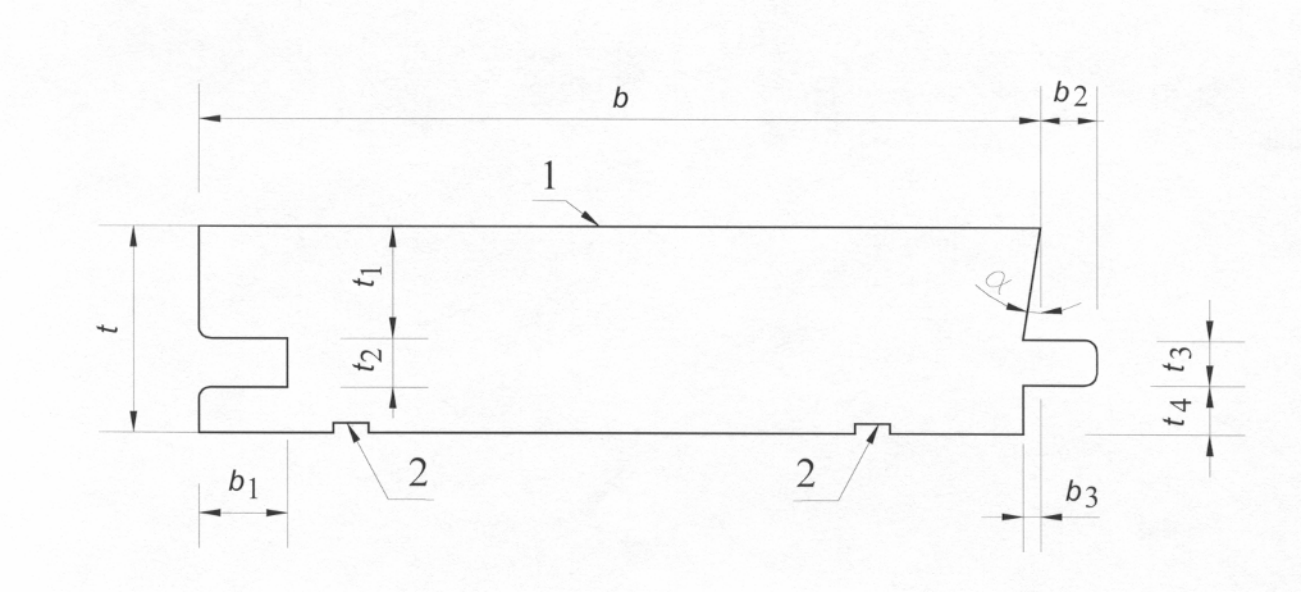
$t_3 \geq 22$ % of t ;

$t_4 \geq 22$ % of t ;

$0° \leq \alpha \leq 3°$.

The arises may be chamfered.

The back may have (a) glue pocket(s), the depth of which shall not be more than 1/5 of the total thickness of the element.



Key

1 Face

2 Glue pockets

Figure 2 — Profile of an overlay flooring element

5.4.3 Nominal dimensions

Table 7 gives nominal dimensions of elements within the scope of this standard.

Table 7 — Nominal dimensions of elements

Dimensions in millimetres

Product	Nominal dimensions		
	Thickness ***t***	**Length** ***L***	**Width** ***b***
Block	$t \geq 13$	200 to 400	40 to 80
Overlay flooring element	$8 \leq t < 14$	200 to 2000	40 to 100

Elements which have dimensions other than those shown in Table 7 for length and width shall fulfil all the other requirements in this standard and shall previously have been characterized by tests for a specific wood species.

5.4.4 Limit deviations

5.4.4.1 Limit deviations from nominal dimensions of the element

The permitted deviations of dimensions of elements at all points at the time of the first delivery are shown in Table 8.

Table 8 — Limit deviations of the element

Dimensions in millimetres

Product	Nominal dimensions					
	Thickness [a] t	**Length** [b] L	**Width** b	**Depth of the female profile** [c] b_1	**Width of the male profile** [c] b_2	**Width of the female profile** t_2 **Thickness of the male profile** t_3
Block	± 0,5	± 0,2	± 0,2	+ 0,3 - 0	+ 0,3 - 0	$0,1 \leq t_2 - t_3 \geq 0,4$
Overlay flooring element	± 0,5	± 0,2	± 0,2	+ 0,3 - 0	+ 0,3 - 0	$0,1 \leq t_2 - t_3 \leq 0,4$

a An element which is finished in the factory or has received surface treatment is allowed t – 0,5 mm. This element has a commercial dimension of the nominal thickness t.

b For random lengths, the permitted length deviation does not apply.

c $b_1 - b_2 \geq 1$ mm.

5.4.4.2 Squareness and other angular deviations

The deviation from all the 90° angles and from required angles for specific patterns shall not exceed 0,2 % measured across the width.

5.4.4.3 Cup

Cup shall not exceed 0,5 % of the width at the time of the first delivery of the uncoated product.

For products which are finished in factory, cup shall not exceed 0,3 % of the width at the time of the first delivery of the product.

5.4.4.4 Bow

If the elements are to be installed by gluing only, bow shall not exceed 0,5 % of the length at the time of the first delivery.

If the elements are to be installed by nailing the limit for bow shall be determined by their suitability to be laid.

5.4.4.5 Spring

For lengths not exceeding 1 m, spring shall not exceed 0,5 ‰ of the considered length at the time of the first delivery.

For lengths more than 1 m, spring shall not exceed 1 ‰ of the considered length at the time of the first delivery.

5.4.5 Machining

All pieces shall be accurately machined and shall be smoothly finished on the face.

Slightly torn grain or similar feature is admissible if it can readily be removed by the ordinary process of sanding the wood flooring after it has been laid in preparation for finishing.

For blocks: all edges shall be well machined with a male profile on one long edge and a female profile along the other long edge and the cross sections. The male profile can be misplaned for 1/3 of its length but not within 1/5 of its length which is adjacent to the two cross sections.

5.5 Technical specifications and properties

5.5.1 Technical characteristics required when in service

Typical values for wood hardness shall be determined by the test defined in EN 1534.

The laying instructions shall be supplied by the producer/supplier.

NOTE The elements specified in this standard will be part of a total floor construction and therefore can only meet the technical demands on the wood flooring when in service if specified and installed according to the laying instructions or usual specifications.

5.5.2 Appearance

5.5.2.1 General

This standard specifies elements manufactured from a natural unmodified material. Any extra requirement for decorative appearance shall be defined.

5.5.2.2 Species

Species shall be specified. A list of the most commonly used species is given in Annex A.

For appearance rules and natural colours, refer to 5.2.

NOTE Wood species exhibit natural colour and grain. Each species and consignment will have varied decorative appearance according to the procurement area.

5.5.2.3 Classification

The class shall be specified.

The decorative appearance of each species will vary with class.

NOTE It should be noted that some classes allow many natural characteristics. This fact should be taken into account when specifying decorative appearance.

5.5.3 Renovation and repair

The elements as described in this standard shall be capable of undergoing renovation at least twice, if not subject to excessive wear and tear or if renovation does not remove an excessive amount of wood.

The construction shall be such that the whole element shall be capable of being replaced.

6 Marking

Each unit defined by the manufacturer at the time of the first delivery shall be clearly identified as follows:

a) the type of product and if applicable its trade name;

b) the designation of the appearance class (○, Δ, □ or appropriate designation for free class(es));

c) the nominal length of the element, in millimetres and the number of elements; or

   1) if random, the mean length, in millimetres; or

   2) the total length, in metres; and

   3) the number of elements;

d) the nominal width and nominal thickness, in millimetres;

e) the laid measure, in square metres;

f) the trade name of the species;

g) patterns, if applicable;

h) if required, the durability class (see EN 460) or preservative treatment (see EN 351-1) against bio deterioration :

i) indication of the laying mode;

j) reference to this standard, EN 13228.

Annex A
(informative)

Botanical and trade names of the most commonly used species for wood flooring (hardwood and softwood species)

Table A.1 contains the botanical and trade names of the most commonly used species for wood flooring in Europe (for more information, refer to EN 13556).

Table A.1 — Species for wood flooring

Botanical species Espèce botanique Botanische Art	Code	Source	Standard name	Nom standard	Handelsüblicher Name
Abies alba Mill	ABAL	EU	silver fir ; whitewood	sapin blanc	Tanne ; Weisstanne
Abies spp.	-	-	fir	sapin	Tanne
Acer campestre L.	ACCM	EU	field maple	érable champêtre	Feldahorn
Acer saccharum Marsh. (principally)	ACSC	AM (N)	rock maple	érable d'Amérique	Zuckerahorn
Acer pseudoplatanus L.	ACPS	EU	sycamore	érable sycomore	Bergahorn
Acer spp.	-	-	maple	érable	Ahorn
Aextoxicon punctatum	-	-	-	olivillo	-
Afzelia spp., principally *A. bipindensis* Harms *A. pachyloba* Harms	AFXX	AF	afzelia	doussié	Afzelia
Alnus glutinosa (L.) Gaertn.	ALGL	EU	common alder	aune glutineux	Schwarzerle
Alnus incana (L.) Moench	ALIN	EU	grey alder	aune blanc	Grauerle
Androstachys johnsonii	-	-	-	mecrussé	Mecrusse
Anisoptera spp.	ANXX	AS	mersawa	mersawa	Mersawa

Table A.1 — Species for wood flooring *(continued)*

Botanical species Espèce botanique Botanische Art	Code	Source	Standard name	Nom standard	Handelsüblicher Name
Baillonella toxisperma Pierre	BLTX	AF	moabi	moabi	Moabi
Beilschmiedia spp.	-	AU	tawa	kanda	Kanda
Betula pendula Roth *B. pubescens* Ehrh	BTXX	EU	European birch	bouleau d'Europe	Birke, Gemeine
Bowdichia nitida Benth.	BWNT	AM(S)	sucupira	sucupira	Sucupira
Brachylaena hutchinsii Hutch.	BYHT	AF	muhuhu	muhuhu	Muhuhu
Brachystegia spp.	BRXX	AF	okwen	naga	Naga
Calophyllum spp.	CLXX	AS	bintangor	bintangor	-
Castanea sativa Mill.	CTST	EU	sweet chestnut	châtaignier	Edelkastanie
Celtis spp.	CJXX	AF	African celtis	diania ; ohia	Ohia
Copaifera salikounda Heckel	CFSL	AF	etimoé	etimoé	Etimoé
Dacryodes igaganga	-	-	-	igaganga	-
Dacryodes pubescens	-	-	-	safoukala	Safoukala
Dacryodes buettneri H.J.Lam	DABT	AF	ozigo	ozigo	Ozigo
Dicorynia guianensis Amsh.	DIGN	AM (S)	basralocus	angélique	Angelique
Dipterocarpus spp.	DPXX	AS	keruing	keruing	Keruing
Entandrophragma angolense (Welw.) C. DC.	ENAN	AF	gedu nohor	tiama	Tiama Mahagoni
Entandrophragma cylindricum (Sprague) Sprague	ENCY	AF	sapele	sapelli	Sapelli Mahagoni
Entandrophragma utile (Dawe & Sprague) Sprague	ENUT	AF	utile	sipo	Sipo Mahagoni
Erythrophleum ivorense A. Chev *E. suaveolens* (Guill. & Perr.) Brenan	EYXX	AF	missanda	tali	Tali
Eucalyptus delegatensis R. T. Bak. *E. obliqua* L'Hérit *E. regnans* F. Muell.	EUXX	AP	"Tasmanian oak" †	eucalyptus de Tasmanie	Tasmanian "oak"

Table A.1 — Species for wood flooring *(continued)*

Botanical species Espèce botanique Botanische Art	Code	Source	Standard name	Nom standard	Handelsüblicher Name
Fagus sylvatica L.	FASY	EU	European beech	hêtre	Buche
Fraxinus excelsior L.	FXEX	EU	European ash	frêne commun	Esche
Gambeya africana Pierre *G. lacourtiana* Aubr. & Pellegr. *G. subnuda* Pierre	GAXX	AF	longhi	longhi	Aningré
Gilbertiodendron dewevrei J. Léon.	GBDW	AF	limbali	limbali	Limbali
Guibourtia arnoldiana (De Wild. & Th. Dur.) J. Léon.	GUAR	AF	mutenye	muténýé	Mutenye
Guibourtia ehie (A. Chev.) J. Léon.	GUEH	AF	ovangkol	ovangkol	Ovenkol
Heritiera spp.	HEXM	AS	mengkulang	mengkulang	Mengkulang
Hymenolobium spp.	-	-	-	sapupira amarella	-
Intsia bijuga (Colebr.) O. Ktze. *I. palembanica* Miq.	INXX	AS	merbau	merbau	Merbau
Juglans nigra L.	JGNG	AM(N)	American walnut	noyer noir d'Amérique	Schwarznußbaum
Juglans regia L.	JGRG	EU	European walnut	noyer	Nußbaum
Larix decidua Mill.	LADC	EU	European larch	mélèze d'Europe	Europäische Lärche
Larix spp.	-	-	larch	mélèze	Lärche
Letestua durissima	-	-	-	congtali	-
Lophira alata Banks ex Gaertn. f.	LOAL	AF	ekki	azobé	Azobé
Manilkara bidentata (D.C.) Chev. *M. huberi* Ducke	MNXX	AM(S)	massaranduba	maçaranduba	Massaranduba
Mansonia altissima A. Chev.	MAAL	AF	mansonia	mansonia	Mansonia

Table A.1 — Species for wood flooring *(continued)*

Botanical species Espèce botanique Botanische Art	Code	Source	Standard name	Nom standard	Handelsüblicher Name
Milicia excelsa (Welw.) C.C. Berg *M. regia* (A. Chev.) C.C. Berg	MIXX	AF	iroko	iroko	Iroko
Millettia laurentii De Wild.	MTLR	AF	wengé	wengé	Wengé
Millettia stuhlmannii Taub.	MTST	AF	panga panga	wengé	Panga Panga
Morus mesozygia *M. lactea*	-	-	-	difou	-
Nauclea diderrichii (De Wild. & Th. Durr.) Merr.	NADD	AF	opepe	bilinga	Bilinga
Nesogordonia papaverifera *(Cistanthera papaverifera)* (A. Chev.) Capuron	NEPP	AF	danta	kotibé	Kotibé
Ocotea rubra Mez	OCRB	AM(S)	red louro	louro vermelho	Louro vermelho
Palaquium spp.	PPXX	AS	nyatoh	nyatoh	Nyatoh
Paratecoma peroba (Record) Kuhlm.	PAPR	AM(S)	white peroba	peroba de campos	Peroba da campos
Peltogyne spp.	PGXX	AM(S)	purpleheart	amarante	Amarant
Pericopsis elata (Harms) van Meeuwen	PKEL	AF	afrormosia	afrormosia	Afrormosia
Picea abies (L) Karst.	PCAB	EU	whitewood; Norway spruce	épicéa	Fichte
Picea sitchensis (Bong.) Carr.	PCST	AM(N)*	Sitka spruce	Sitka spruce	Sitka-Fichte
Pinus caribaea Morelet	PNCR	AM(C)	Caribbean pitch pine	pitchpin	Pitch pine ; Pechkiefer
Pinus pinaster Alt.	PNPN	EU	maritime pine	pin maritime	Seestrandkiefer
Pinus sylvestris L.	PNSY	EU	redwood ; Scots pine	pin sylvestre	Kiefer
Piptadeniastrum africanum (Hook. f.) Brenan	PIAF	AF	dahoma	dabéma	Dabema

Table A.1 — Species for wood flooring *(continued)*

Botanical species Espèce botanique Botanische Art	Code	Source	Standard name	Nom standard	Handelsüblicher Name
Pometia pinnata Forst. *P. tomentosa*	PMPN	AS;AP	taun	kasai	Kasai
Prunus avium L.	PRAV	EU	European cherry	merisier	Kirschbaum;Vogelkirsche
Prunus serotina Ehrh.	PRSR	AM(N)	American cherry	merisier d'Amérique	Amerikanische Kirsche
Pseudotsuga menziesii (Mirb.) Franco	PSMN	AM(N)*	"Douglas fir" †	Douglas	Douglasie
Pterocarpus angolensis DC.	PTAN	AF	muninga	muninga	Muninga
Pterocarpus soyauxii Taub. *P. osun* Craib	PTXX	AF	African padauk	padouk	Afrikanisches Padouk
Qualea spp.	-	-	-	Gronfolo rose	-
Quercus petraea (Matt.) Liebl. *Q. robur* L.	QCXE	EU	European oak	chêne blanc européen	Eiche
Quercus spp. including *Q. alba* L. and other spp.	QCXA	AM(N)	American white oak	chêne blanc d'Amérique	Weißeiche
Quercus spp. including *Q. rubra* L.	QCXR	AM(N)	American red oak	chêne rouge d'Amérique	Roteiche
Shorea spp. principally *S. atrinervosa* *S. ciliata*	SHBL	AS	balau	balau	Balau
Shorea spp. principally *S. guiso* (Blanco) Bl. *S. kunstleri* King	SHRB	AS	red balau	red balau	Red Balau
Shorea spp. principally *S. bracteolata* *S. hypochra* *S. floribunda* *S. sericuflora*	SHWM	AS	white meranti	meranti blanc	Weisses Meranti
Shorea spp. principally *S. curtini* *S. pauciflora*	SHDR	AS	dark red meranti	dark red meranti	Dunkelrotes Meranti
Sindoropsis letestui J. Léon.	SPLT	AF	ghéombi	ghéombi	Ghéombi

Table A.1 — Species for wood flooring *(completed)*

Botanical species Espèce botanique Botanische Art	Code	Source	Standard name	Nom standard	Handelsüblicher Name
Staudtia stipitata Warb. *S. kamerunensis*	SSST	AF	niové	niové	Niove
Sterculia rhinopetala K Schum.	STRH	AF	brown sterculia	lotofa	Lotofa
Swietenia macrophylla King	SWMC	AM(C&S)	American mahogany	mahogany	Amerikanisches Mahagoni
Swietenia mahagoni Jacq.	SWMH	AM(C)	American mahogany	mahogany	Echtes Mahagoni
Tabebuia spp.	AM(S)	-	-	ipé	-
Tectona grandis L. f.	TEGR	AS	teak	teck	Teak
Testulea gabonensis Pellegr.	TZGB	AF	izombé	izombé	Izombé
Tieghemella africana Pierre	TGAF	AF	makoré	makoré	Douka
Tieghemella heckelii Pierre ex A. Chev.	TGHC	AF	makoré	makoré	Makoré
Ulmus procera Salisb.	ULPR	EU	English elm	orme champêtre	Englische Ulme
Ulmus x hollandica Mill.	ULXH	EU	Dutch elm	orme de Hollande	Holländische Ulme
Vouacapoua americana *V. pallidior* *V. macropetala*	-	-	-	wacapou	-

Annex B
(normative)

Principles for the classification of the free class

The free class is an appearance class with a particular selection offered by the producer or on request by the buyer.

The free class shall be described with all the features given in Tables B.1 or B.2 and their requirements. The features shall be measured according to EN 1310.

The same species may have several different values for each feature to have several selections.

Table B.1 — Classification for hardwood species

Face of the element	
Feature	**Limit**
Sound sapwood	
Knots (sound, intergrown, unsound)	
Yellow stain	
Checks	
Bark pockets	
Lightning shake	
Curly grain	
Slope of grain	
Sound heart	
Colour variation (incl. blackheart, red heart, etc.)	
Stick marks	
Medullary ray	
Biodeterioration	
Non-visible parts	
All possible features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring.	

Table B.2 — Classification for softwood species

Face of the element	
Feature	**Limit**
Sound sapwood	
Knots (sound, intergrown, unsound)	
Bark pockets	
Resin pockets	
Pith	
Checks	
Splits	
Lightning shake	
Slope of grain	
Colour variation	
Stick marks	
Biodeterioration	
Non-visible parts	
All possible features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring.	

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[1] EN 351-1, *Durability of wood and wood-based products — Preservative-treated solid wood — Part 1 : Classification of preservative penetration and retention*

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[3] EN 13556, *Round and sawn timber — Nomenclature of timbers used in Europe*

[4] EN 14342, *Wood flooring — Characteristics, evaluation of conformity and marking*

[5] EN 844-7:1997, *Round and sawn timber — Terminology — Part 7: Terms relating to anatomical structure of timber*

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