BRITISH STANDARD

BS EN 13226:2009

Wood flooring — Solid parquet elements with grooves and/or tongues

ICS 79.080

BSI
British Standards

National foreword

This British Standard is the UK implementation of EN 13226:2009. It supersedes BS EN 13226:2002 which is withdrawn.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.

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EUROPEAN STANDARD

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EN 13226

May 2009

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English Version

Wood flooring - Solid parquet elements with grooves and/or tongues

Planchers en bois - Eléments de parquet massif avec rainures et/ou languettes

Holzfußböden - Massivholz-Elemente mit Nut und/oder Feder

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 13226:2009) 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of an identical text or by endorsement, at the latest by November 2009, and conflicting national standards shall be withdrawn at the latest by November 2009.

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 13226:2002.

Compared to EN 13226:2002, the following changes have been made:

a) New limit deviations for nominal width of the element (5.4.3.1),

b) New value for cup (5.4.3.3),

c) New value for spring (5.4.3.5),

d) Modifications regarding the marking (Clause 6).

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, 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 European Standard is one of a series of standards concerning wood flooring and wood panelling and cladding.

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

A large amount of knowledge exists about solid parquet 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 parquet is mainly influenced by species, classification and the pattern.

1 Scope

This European Standard specifies the characteristics of solid parquet elements with grooves and/or tongues for internal use as flooring. This standard is not applicable to panels made from elements for which a separate standard is in course of preparation.

This standard covers elements with or without surface treatment.

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 844-7:1997, *Round and sawn timber – Terminology – Part 7: Terms relating to anatomical structure of 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 and parquet flooring – Determination of resistance to indentation (Brinell) – 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 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 844-7:1997, 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
left-handed strip
element having the end tongue on the left when viewed on the face with the edge tongue directed towards the observer

[EN 13756:2002]

3.2
right-handed strip
element having the end tongue on the right when viewed on the face with the edge tongue directed towards the observer

[EN 13756:2002]

3.3
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 groove;

b_2 Width of the tongue;

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 groove;

t_3 Thickness of the tongue;

t_4 Thickness of the part below the tongue;

t_5 Depth of optional glue pocket;

a Slope of the upper lip;

α Arrow tail;

ß Slope of the under lip.

5 Specific product requirements

5.1 Wood species

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

5.2 Appearance

5.2.1 General rules

Tables 1 to 9 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). Biodeterioration is measured according to EN 1311.

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

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

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.

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.

1) The chamfering is visible when elements are assembled.

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 ≤ 8 mm diameter ≤ 1 mm	Permitted if: diameter ≤ 10 mm diameter ≤ 5 mm	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	Permitted up to 15 mm in length	
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 tongue 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**		
	○	∆	□
Sound sapwood	Not applicable	Not applicable	Not applicable
Knots Sound and intergrown Unsound knots	Permitted if: diameter ≤ 2 mm diameter ≤ 1 mm	Permitted if: diameter ≤ 10 mm diameter ≤ 5 mm	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	Permitted up to 15 mm in length	
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. Slight traces of natural discoloration and mineral lines permitted.	Permitted	
Stick marks	Not 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 Sound and intergrown Unsound knots	Permitted if: diameter ≤ 2 mm diameter ≤ 1 mm	Permitted if: diameter ≤ 10 mm diameter ≤ 5 mm	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	Permitted up to 15 mm in length	
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 [a]. Slight traces of natural discoloration permitted.	Permitted	
Red heart	Not permitted	Permitted	
Stick marks	Not 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.			

[a] Permitted for steamed beech.

5.2.2.4 *Pinus pinaster* (maritime pine)

Rules for maritime pine are given in Table 4.

Table 4 — Classification for *Pinus pinaster* (maritime pine)

Face of the element			
Features	**Class**		
	○	Δ	□
Sound sapwood	Permitted	Permitted	Permitted
Knots			
Sound and intergrown	Permitted if diameter ≤ 2 mm[a] .	35 mm knots permitted with slight checks [b], if not grouped together [a]. If grouped together, their total area [c] shall not exceed the representative area of one 35 mm diameter knot.	No limit in diameter. Slight torn surface permitted. Knots holes or loose knots not permitted
Unsound knots	Not permitted	Permitted if diameter ≤ 15 mm	
Resin pockets and traces of pith	Length ≤ 10 mm permitted	Length ≤ 70 mm permitted	Resin pockets are only permitted if the hole does not go through the thickness of the element.
Checks and splits	Hardly visible permitted	Slight splits at the ends and checks permitted	Splits at the ends and checks permitted
Colour variation	Permitted if natural colours of the wood		
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.			

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

[b] Knots are slightly checked provided the width of the check does not exceed 1 mm.

[c] Area: $(\pi \times d_{a1} \times d_{b1})/4 + (\pi \times d_{a2} \times d_{b2})/4 + \ldots$ when d_{a1} is the smallest and d_{b1} the largest diameter of the first knot.

5.2.2.5 *Castanea sativa* (sweet chestnut)

Rules for sweet chestnut are given in Table 5.

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

Face of the element			
Features	**Class**		
	○	∆	□
Sound sapwood	Not permitted	Not permitted	Not permitted
Knots Sound and intergrown Unsound knots	Permitted if: diameter ≤ 10 mm diameter ≤ 5 mm	Permitted if: diameter ≤ 20 mm diameter ≤ 8 mm	Permitted if: diameter ≤ 25 mm diameter ≤ 15 mm
Curly grain	Permitted up to 50 % of the face of the element	Permitted	Permitted
Sound heart	Permitted up to 20 % of the length of the element	Permitted	Permitted
Yellow stain	Permitted up to 5 % of the face of the element	50 % permitted	Permitted
Checks and splits	Not permitted	Permitted when the length ≤ width of the element	Permitted when the length ≤ 50 % of the length of the element
Ends checks going through the element	Not permitted	Permitted if ≤ 10 mm in length	Permitted if ≤ 30 mm in length
Red coloration / Blackheart	Not permitted	Permitted. when the length ≤ 20 % of the length of the element	Permitted when the length ≤ 50 % of the length of the element
Slope of the grain	Permitted, no limit	Permitted, no limit	Permitted, no limit
Bark pockets **Lightning shake**	Not permitted	Not permitted	Not 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 of the tongue without taking into account the limits set for the face.			

5.2.2.6 *Larix* spp. (larch)

Rules for larch are given in Table 6.

Table 6 — Classification for *Larix spp.* (larch)

Face of the element			
Features	**Class**		
	○	Δ	□
Sound sapwood	Not permitted	Permitted	Slight traces permitted
Knots Sound and intergrown Unsound knots	Permitted if: diameter ≤ 10 mm diameter ≤ 3 mm	Permitted if: diameter ≤ 20 mm diameter ≤ 10 mm	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	Permitted up to 15 mm in length	
Bark pockets	Not permitted	Not permitted	
Lightning shake	Not permitted	Not permitted	
Slope of grain	Permitted, no limit	Permitted, no limit	
Colour variation	5 % of the face permitted	Permitted	
Resin pockets	Not permitted	Permitted 2 mm in width Permitted 25 mm in length	
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 tongue without taking into account the limits set for the face.			

5.2.2.7 *Pinus sylvestris* (redwood; Scots pine)

Rules for redwood; Scots pine are given in Table 7.

Table 7 — Classification for *Pinus sylvestris* (redwood; Scots pine)

Face of the element			
Features	**Class**		
	○	Δ	□
Sound sapwood	Permitted	Permitted	All features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring.
Knots Sound and intergrown Unsound knots	Permitted if: diameter ≤ 10 mm diameter ≤ 3 mm	Permitted if: diameter ≤ 20 mm diameter ≤ 10 mm	
Checks	Not permitted	Permitted up to 15 mm in length	
Bark pockets	Not permitted	Not permitted	
Lightning shake	Not permitted	Not permitted	
Slope of grain	Permitted, no limit	Permitted, no limit	
Colour variation	5 % of the face permitted	Permitted	
Resin pockets	Not permitted	Permitted 2 mm in width Permitted 25 mm in length	
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.			

5.2.2.8 *Picea* spp. (spruce) and *Abies* spp. (fir)

Rules for spruce and fir are given in Table 8.

Table 8 — Classification for *Picea* spp.(spruce) and *Abies* spp. (fir)

Face of the element			
Features	**Class**		
	○	Δ	□
Sound sapwood	Permitted	Permitted	All features permitted without limit to size or quantity if these do not impair the strength or the wearing quality of the wood flooring.
Knots Sound and intergrown Unsound knots	Permitted if: diameter ≤ 10 mm diameter ≤ 3 mm	Permitted if: diameter ≤ 20 mm diameter ≤ 10 mm	
Checks	Not permitted	Permitted up to 15 mm in length	
Bark pockets	Not permitted	Not permitted	
Lightning shake	Not permitted	Not permitted	
Slope of grain	Permitted, no limit	Permitted, no limit	
Colour variation	5 % of the face permitted	Permitted	
Resin pockets	Not permitted	Permitted 2 mm in width Permitted 25 mm in length	
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.			

5.2.2.9 Other hardwoods

Rules for other hardwoods are given in Table 9.

Table 9 — 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 (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 producers' 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 and maritime pine 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

5.4.1.1 Forms and dimensions

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

All dimensions are given at a reference moisture content of 9 %, except dimensions for chestnut and maritime pine elements 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.

NOTE Traditionally wood flooring elements to be used for “strip- or brick-pattern flooring“ are manufactured right-handed (except in the case of maritime pine).

All the elements shall have the four edges perpendicular to the face or with a maximum slope of 3° (see Figure 1).

The arrisses may be chamfered.

The back may have (a) glue pocket(s).

5.4.1.2 Dimensional characteristics

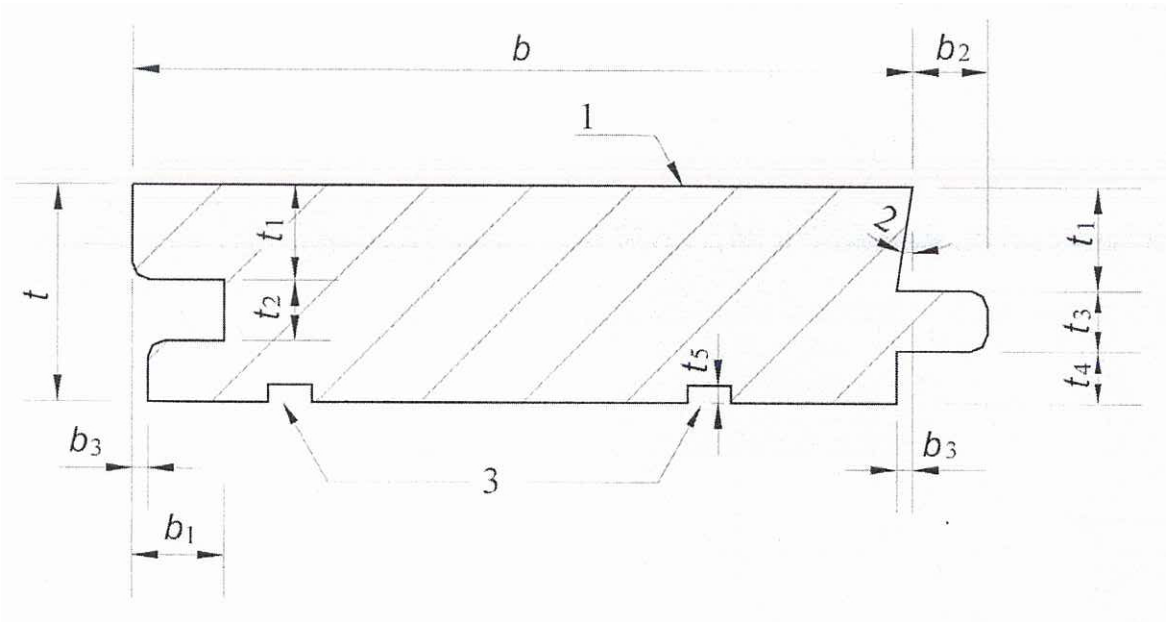
The following dimensional characteristics given refer to Figures 1 and 2:

- thickness above the groove: $t_1 \geq 35$ % of the total thickness t of the element,
- thickness of the tongue: $t_3 \geq 22$ % of the total thickness t of the element,
- thickness of the part below the tongue: $t_4 \geq 22$ % of the total thickness t of the element,
- depth of optional glue pocket: $t_5 \leq t/5$,
- width of the tongue: For $b < 70$ mm, $b_2 \geq 3$ mm (minimum 2,5 mm for 10 % of the length),

  For $b \geq 70$ mm, $b_2 \geq 5$ mm (minimum 3 mm for 10 % of the length),
- depth of the groove minus the width of the tongue: $b_1 - b_2 \geq 1$ mm,
- slope of the upper lip: $0° \leq a \leq 3°$,
- undercut: 0 mm $\leq b_3 \leq$ 1,5 mm,
- arrow tail: α (indicative value) = 67°,
- slope of the underlip: ß(indicative value) = 30°.

5.4.1.3 Examples of profiles

Figure 1 and Figure 2 show the most common profiles of elements.



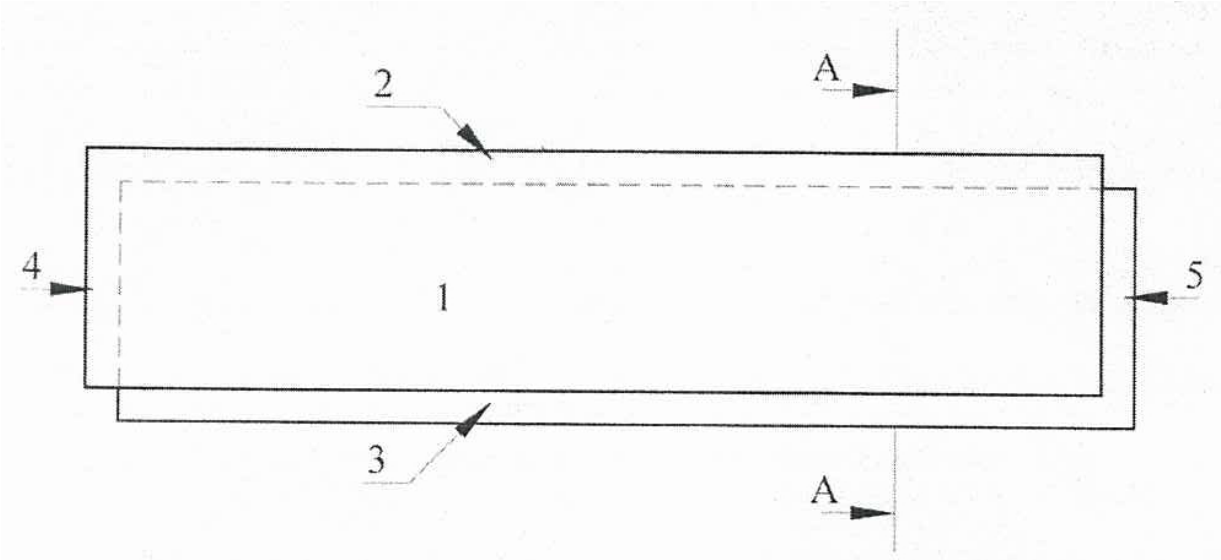
Key

1 Face of the element

2 Slope a

3 Glue pockets

a) Element of type 1 – Cross section AA

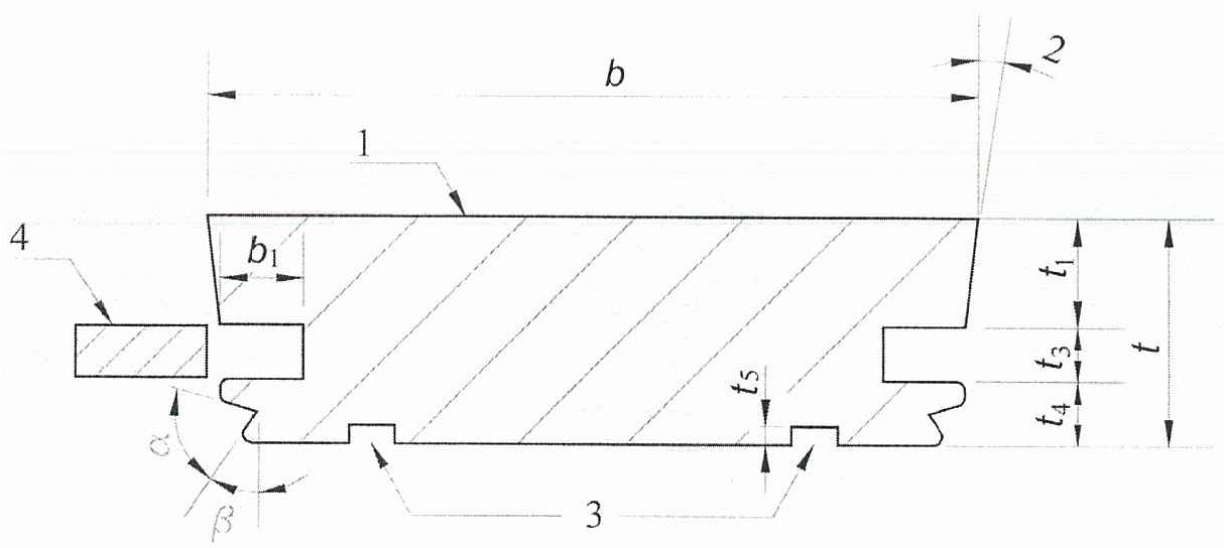


Key

1 Face of the element
2 Edge groove
3 Edge tongue
4 End groove
5 End tongue

b) Element of type 1 - View of the face

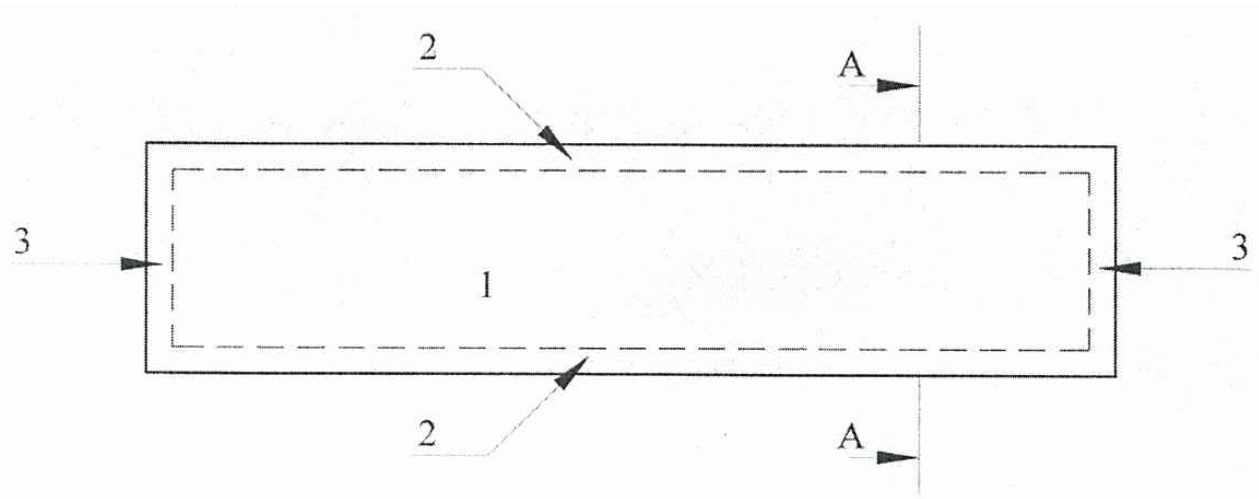
Figure 1 — Element of type 1



Key

1 Face of the element
2 Slope a
3 Glue pockets
4 Edge tongue

a) Element of type 2 – Cross section AA



Key

1 Face of the element

2 Edge groove

3 End groove

b) Element of type 2 - View of the face

Figure 2 — Element of type 2

5.4.2 Nominal dimensions

Table 10 gives dimensions of elements.

Table 10 — Nominal dimensions of elements

Dimensions in millimetres

Thickness *t*	**Length** *l*	**Width** *b*
≥ 14 [a]	≥ 250	≥ 40

[a] *t* = 22 mm is the most common thickness produced in Europe. Other common thicknesses are: 15 mm, 16 mm, 19 mm, 20 mm and 23 mm.

Elements which have dimensions other than those shown in Table 10 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.

5.4.3 Limit deviations

5.4.3.1 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 11.

Table 11 — Limit deviations of the element

Dimensions in millimetres

Thickness [a] t	**Length** [b] [c] l	**Width** b	**Depth** [d] **of the groove** b_1	**Width** [d] [e] **of the tongue** b_2	**Width of the groove** t_2 **Thickness of the tongue** t_3
± 0,2	± 0,5	± 0,5	+ 0,3 - 0	+ 0 - 0,3	$0,1 \leq t_2 - t_3 \leq 0,4$

[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 limit deviation does not apply.

[c] Limit deviations for elements for Hungarian or brick pattern are ± 0,2 mm.

[d] $(b_1 - b_2) \geq 1$ mm.

[e] The limit deviations for the width of the tongue b_2 are qualified by 5.4.4.

5.4.3.2 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.

5.4.3.3 Cup

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

5.4.3.4 Bow

Bow shall be evaluated taking into account the thickness, the length, the species and the method of laying.

If the elements are to be installed by gluing only, this shall be stated when ordering. For such elements, 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 using commercially available equipment.

5.4.3.5 Spring

Spring shall be evaluated taking into account the thickness, the length, the species and the method of laying.

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.

If the elements are to be installed by gluing only, this shall be stated when ordering. For such elements, spring 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 spring shall be determined by its suitability to be laid using commercially available equipment.

5.4.4 Machining

All pieces shall be accurately machined and shall be smoothly finished on the face of elements without surface treatment.

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. A slight misplaning, not exceeding 1/3 of the length on the back, is allowed if it does not extend to either end of the element. Misplaning of the edge of the tongue is admissible but a minimum 3 mm width b_2 shall be maintained. The horizontal portion of the tongue may reduce to 2,5 mm for $b < 70$ mm and 3 mm for $b \geq 70$ mm, but this is restricted to 10 % of the length of any element.

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 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 Specific site requirements

NOTE See EN 14342.

5.5.3 Appearance

5.5.3.1 General

This standard specifies elements manufactured from a natural material.

5.5.3.2 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.

5.5.3.3 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.

5.5.4 Renovation and repair

The solid element 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) wood flooring element with tongues and/or grooves and if applicable its trade name;

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

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

   1) the mean length, in millimetres and the number of elements,

   2) or the total length, in metres and the number of elements,

   3) or the number of elements, in metres and the minimum length of the elements in millimetres;

d) nominal width and nominal thickness, in millimetres;

e) laid measure in square metres;

f) trade name of the species;

g) patterns, if applicable;

h) if required, the durability class (EN 460) or preservative treatment (EN 351-1) against biodeterioration;

i) indication of the laying mode;

j) reference to this standard, EN 13226.

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
Baillonella toxisperma Pierre	BLTX	AF	moabi	moabi	Moabi
Beilschmiedia spp.	-	AU	tawa	kanda	Kanda

Botanical species Espèce botanique Botanische Art	Code	Source	Standard name	Nom standard	Handelsüblicher Name
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"
Fagus sylvatica L.	FASY	EU	European beech	hêtre	Buche
Fraxinus excelsior L.	FXEX	EU	European ash	frêne commun	Esche

Botanical species Espèce botanique Botanische Art	Code	Source	Standard name	Nom standard	Handelsüblicher Name
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	mutényé	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
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

Botanical species Espèce botanique Botanische Art	Code	Source	Standard name	Nom standard	Handelsüblicher Name
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
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

Botanical species Espèce botanique Botanische Art	Code	Source	Standard name	Nom standard	Handelsüblicher Name
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
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

Botanical species Espèce botanique Botanische Art	Code	Source	Standard name	Nom standard	Handelsüblicher Name
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 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 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 14342, *Wood flooring – Characteristics, evaluation of conformity and marking*

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

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

[4] EN 460*, Durability of wood and wood-based products – Natural durability of solid wood - Guide to the durability requirements for wood to be used in hazard classes*

[5] EN 13647, *Wood and parquet flooring and wood panelling and cladding – Measurement of geometrical characteristics*

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