

## Solid wood elements with groove and/or tongue - "Wood strip flooring"



### General description

Solid wood elements with groove and/or tongue are solidwood strips of soft- or hardwood with a thickness (t)  $\geq 14$  mm, which at one longitudinal side and at one width side are provided with a groove each and at the respectively opposite side with a planed tongue each. In Europe, solidwood elements are usually manufactured with thicknesses of 22 mm, but thicknesses of 15 mm, 16 mm, 19 mm, 20 mm und 23 mm are also common. The length (l) of the products defined with  $\geq 250$  mm and the width (b) with  $\geq 40$  mm. The edges of the elements may be bevelled; the bottom side may have one or several adhesive rebates. For elements without surface treatment, the top side must be smoothed. The type of wood is selected - depending on the requirements of use in the structure - and

must be stated. The most common types of wood are listed in Appendix A (Hard- and Softwoods) of the standard. Sorting is undertaken into the three appearanceclasses  $\bigcirc$ ,  $\Delta$  and  $\square$ . According to the nationalpreface of EN 13226, for Austria, the free sorting "exquisite" (for oak, ash and beech) is used for determination of the sorting determination. However - depending on the manufacturer - further free sortings (classes) are also possible, which must correspond to the principles of Appendix B of the standard stated. The fire behaviour of the parquet is classified acc. to the classification report of the manufacturer or acc. to EN 13501-1, resp. The CE marking of wood flooring and parquet acc. to EN 14342 has been compulsory since 01.03.2010.

### Range of application

\_according to EN 13226

Solid wood elements with groove and/or tongue can be glued-down (e.g. screed, wood composite laying plates) or nailed-down (subfloor, open subfloor) and are intended for use as floor covering in the interior. Elements with or without surface treatment can be used. The laying patterns are mainly strip-like (bond) or herringbone. If no type of laying was agreed, the simple strip-like design (regular bond) without wall frieze must be executed. Upon initial delivery, the elements must have a moisture content of 7 % to 11 %. The laying instructions are provided by the manufacturer/supplier.

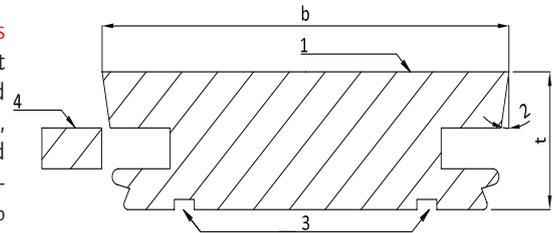
### Technical references

EN 13226	Wood flooring - Solid parquet elements with grooves and/or tongues
EN 14342	Wood flooring and parquet - Characteristics, evaluation of conformity and marking
ÖNORM B 2218	Verlegung von Holzfußböden - Werkvertragsnorm (Laying of wooden floorings)
EN 13756	Wood flooring - Terminology
ÖNORM DIN 18202	Toleranzen im Hochbau - Bauwerke (Tolerances in building construction - Buildings)
EN 13647	Wood flooring and wood panelling and cladding - Determination of geometrical characteristics
ÖNORM C 2354	Transparente Beschichtungsstoffe für Holzfußböden und daraus hergestellte Versiegelungen - Mindestanforderungen und Prüfungen (Transparent sealing materials for wooden floors and sealings made thereof - Minimum requirements and test methods)

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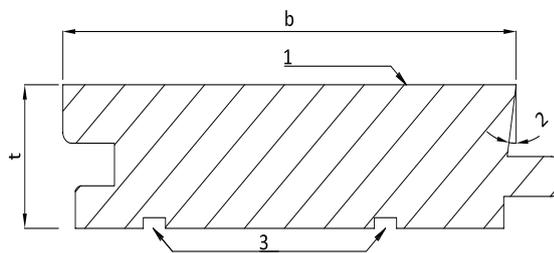
**Typical dimensions - geometrical properties**

Any element shapes are admissible, provided that the dimensions correspond to the stated dimensioning or admissible deviations of EN 13226, resp. The dimensions - acc. to dimensioning and admissible limit deviations of the above standard - are stated with a reference moisture of normally 9 % (to be determined acc. to EN 13647).



1 Top side of the element  
 2 Undercut  
 3 Adhesive rebate  
 4 Longitudinal tongue

Fig. 1 and 2: Typical profile examples



1 Top side of the element  
 2 Undercut  
 3 Adhesive rebates

Elements, the dimensions (length and width) of which do not correspond to the table below, must fulfil all other requirements of the standard and previously have been checked for the respective type of wood.

Thickness (t)	Length (l)	Width (b)
≥ 14 mm	≥ 250 mm)	≥ 40 mm

**Sorting**

A class must be determined. The sorting rules concerning the appearance at the top side (visible) as well as the rear and narrow sides (not visible) of the elements are - for the types of wood oak, ash, maple, beech, Maritime pine, sweet chestnut, larch, pine, Scots pine, spruce, fir, and a table for "other hardwoods" - defined in Tables 1 to 9 of EN 13226. The top side must not have any cracks and the wood must be healthy (to be determined acc. to EN 13647). Acc. to the national preface of the standard, the sorting class "exquisite" (see table below) must not be used for further free sorting classes in the types of wood oak, ash and beech. In order to permit unavoidable differences in the sortings, 3 % of the strips may originate from other sorting classes. All additional strips from other classes are admissible, provided that the overall appearance of the wood flooring is not diminished.

Table 1: e.g. Sorting "exquisite" of oak, ash and beech acc. to the national preface (in Austria) of EN 13226

Top side of the element	
Characteristic	Restrictions
healthy sapwood for oak	inadmissible
knots	
healthy, ingrown	occasionally admissible < 2 mm
rotten	inadmissible
yellowing	inadmissible
shallow cracks	inadmissible
bark inclusions	inadmissible
lightning cracks	inadmissible
curly grain	inadmissible
slope of grain	inadmissible over 30 degrees from the longitudinal direction of the parquet strips
curled spot	admissible up to max. half the parquet strip width in max. 25 % of the number of pieces
healthy heart	
for ash (brown heart) and beech (red heart)	inadmissible
for oak	admissible
differences in colour	minor differences admissible

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Characteristic	Restrictions
stacking lath marking	inadmissible
medullary rays	admissible
pest infestation	inadmissible

Non-visible parts

All characteristics are admissible without restrictions regardless of size or quantity, provided that they do not affect stability or durability of the wood flooring. Independent of the restrictions applicable to the top side, healthy sapwood is admissible from the rear up to the top side of the tongue.

Table 2: e.g. Sorting rules for oak according to EN 13226

Characteristic	Top side of the element		
	Class		
	○	△	□
healthy sapwood	inadmissible	admissible	minor impairments admissible
knots	admissible, when: diameter ≤ 8 mm	admissible, when: diameter ≤ 10 mm	all characteristics are admissible without restrictions in regards to size or quantity, provided that they do not affect stability or durability of the wood flooring.
healthy and ingrown rotten	diameter ≤ 1 mm	diameter ≤ 5 mm	
shallow cracks	inadmissible	admissible up to 15 mm length	
bark inclusions	inadmissible	inadmissible	
lightning cracks	inadmissible	inadmissible	
slope of grain	unrestrictedly admissible	unrestrictedly admissible	
difference in colour	minor differences admissible	admissible (oak brown-heart)	
medullary rays	admissible	admissible	inadmissible except for blue stain and black feeding tunnel
pest infestation	inadmissible	inadmissible	

Non-visible parts

All characteristics are admissible without restrictions regardless of size or quantity, provided that they do not affect stability or durability of the wood flooring. Independent of the restrictions applicable to the top side, healthy sapwood is admissible from the rear up to the top side of the tongue.

**Fire performance**

\_classification report of the manufacturer  
 \_classification according to EN 13501-1 C<sub>fl</sub>-s1 and D<sub>fl</sub>-s1 (with surface coating) upon fulfilment of the requirements according to EN 14342, Table 1 (Decision of the Commission 2006/213/EC of 6. March 2006)

\_classification according to EN 13501-1 D<sub>fl</sub>-s1 and E<sub>fl</sub> (without surface coating) upon fulfilment of the requirements according to EN 14342, Table 1 (Decision of the Commission 2006/213/EC of 6. March 2006)

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Table 3: Classes of the fire behaviour of wood flooring (extract acc. to EN 14342)

Product	Product details	Minimum value of medium raw density (kg/m³)	Minimum overall thickness (mm)	End-use condition	class for floors
Wood flooring and parquet	solid wood flooring of oak or beech with surface flooring	beech: 680 oak: 650	8	glued to the substrate (at least class A2-s1,d0)	C <sub>fl</sub> - s1
	solid wood flooring of oak beech or spruce with surface flooring	beech: 680 oak: 650 spruce: 450	20	with or without bottom side air gap	
	other solid wood flooring with surface coating	390	8	without bottom-side air gap	D <sub>fl</sub> - s1
		390	20	with or without bottom side air gap	
	other solid wood flooring and parquet (without surface coating)	400	6	all	E <sub>fl</sub>
Wood flooring	solid wood flooring of pine and spruce(without surface coating)	pine: 480 spruce: 400	14	without bottom-side air gap	D <sub>fl</sub> - s1
	solid wood flooring of beech, oak, pine or spruce (without surface coating)	beech: 700 oak: 700 pine: 430 spruce: 400	20	with or without bottom side air gap	D <sub>fl</sub> - s1

**Additional**

\_Bamboo has no secondary thickness growth, it is not considered as a type of wood, and therefore it is not covered in the standard EN 14342.

\_Underfloor heating:

Wood and wood composites have proven themselves in connection with underfloor heating systems. According to ÖNORM B 2242-7 (Installation of floor heatings with hot water - Works contract - Part 7: Terms of contract with wooden floorings) the wood flooring must be glued to the screed over the entire surface. Laying of the wood flooring must only be started after the standard initial heating cycle. At the time of laying, the wood moisture must lie between 7 % and 9 % - since a wood moisture of approx 5 % to 7 % occurs during the heating period, a low laying moisture is recommended.

Wood strip flooring with lower thicknesses is well suited for this - the thickness of the elements is limited to max. 24 mm. In order to reduce drying joints, sortings with a predominant portion of vertical annual growth rings must be used. Types of wood with an unfavourable swelling and shrinking

behaviour are not suitable (e.g. common beech). For heat conduction of the covering, high density of the wood is favourable - hardwood conducts better than softwood by approx. 30 %.

\_Surface treatment:

Varnishing: this is recommended with high stresses on the wood flooring (classes A, B, C according to ÖNORM C 2354).

Non-film-forming finishing (oils, waxes, soaps,...): for a more uniform joint appearance above underfloor heating systems, non-film-forming finishing is recommended, since an additional "adhesion" of the individual parquet elements may result from sealing, whereby fewer, but larger, irregularly distributed joints can form. Oiled floors have no film-forming surface - they can be more sensitive compared to varnished surfaces (staining,...). Furthermore, oiled floors require regular and proper care with special care products, which also depends on the intensity of the stresses in the course of usage. Then non-film-forming surface treatments are also suitable for highly stressed floors.

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### Sample sheet for the sorting of a free class

\_acc. to the principles of Appendix B of EN 13226. The free class is a sorting by appearance with a special selection offered by the manufacturer or requested by the customer, resp. The free class must be described for all characteristics of Table 1 or Table 2, including their requirements (for further information see item "Sorting").

Table 1: Sorting of hardwoods

Designation of the sorting:	Type of wood:	
Top side of the element		
Characteristic	Restrictions	
healthy sapwood		
knots healthy, ingrown, rotten		
yellowing		
shallow cracks		
bark inclusions		
lightning cracks		
curly grain		
slope of grain		
healthy heart		
colour variants (including brown heart, red heart,..)		
stacking lath marking		
medullary rays		
pest infestation		
Non-visible parts		
All characteristics are admissible without restrictions in regards to size or quantity, provided that they do not affect stability or durability of the wood flooring.		

Table 2: Sorting of softwoods

Designation of the sorting:	Type of wood:	
Top side of the element		
Characteristic	Restrictions	
healthy sapwood		
knots healthy, ingrown, rotten		
bark inclusions		
pitch pockets		
pith		
shallow cracks		
continuous cracks		
lightning cracks		
slope of grain		
differences in colour		
stacking lath marking		
pest infestation		
Non-visible parts		
All characteristics are admissible without restrictions in regards to size or quantity, provided that they do not affect stability or durability of the wood flooring.		