



KVH® SOLID STRUCTURAL TIMBER
THE CONSTRUCTION MATERIAL FOR
MODERN TIMBER CONSTRUCTION



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KVH® solid structural timber

The easiest and safest way of making sure you use the right type of construction timber for modern timber structures is to choose KVH® solid construction timber.

KVH® solid structural timber is high-quality sawn construction timber produced from softwood. Given the use to which it is put, it meets not only higher but supplementary requirements as well and is subject to strict quality controls in production for guaranteed consistently high quality.

Two different assortments are offered, to cover different applications, the main differences being in the surface quality:

- KVH®-Si for exposed applications and
- KVH®-Nsi for non-exposed applications

KVH® is available in the native German wood species of spruce, fir, pine, larch and Douglas fir.

Characteristics and criteria

KVH® is largely used for constructions where the design calculations for the cross-section are based on structural strength.

Grading is in accordance with DIN 4074-1 ("Grading of timber by strength").

In addition, KVH® also meets special criteria in respect of the following, over and above the requirements of the DIN standard:

- Wood moisture content
- Type of conversion
- Dimensional stability of the cross-sections
- Knot condition
- Resin gall
- Surface quality

This results in products of a much higher quality, offering guaranteed conformity with all the requirements of construction timber.



DIMENSIONAL STABILITY

Type of conversion

The type of conversion plays a decisive role in considerably reducing cracking, warping and twisting in the wood.

For cross-sections of up to 100 mm a core plank of at least 40 mm in thickness is removed for free of heart conversion.

For all cross-sections over 100 mm and the entire KVH® range for non-exposed applications the specification is for clear-heart conversion.

Wood moisture content

KVH® solid structural timber is kiln-dried. The maximum moisture content is $15\% \pm 3\%$.

Once installed, therefore, KVH® retains its shape and fit outstandingly well. There is no further risk of any change in the shape.

Finger-jointing

Thanks to the friction-locked longitudinal connection of the individual pieces, sawn construction timber can be produced in virtually any length.

In Germany, finger-jointing is permitted for both assortments of KVH® (exposed and non-exposed applications) and this is the only method used.

Finger-joints in KVH® do not need to be taken into account in stress calculations.

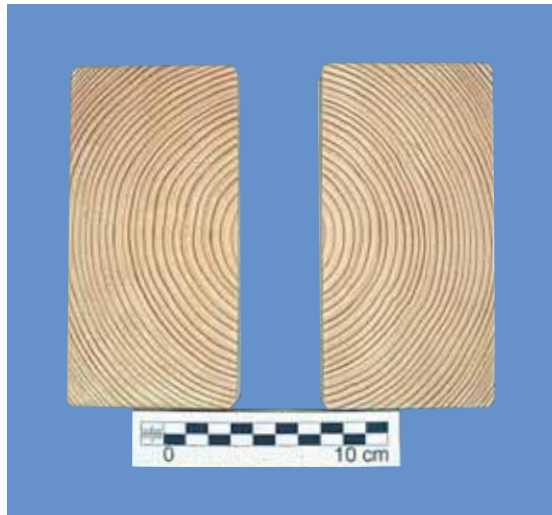
Thanks to modern-day color-neutral glues, the finger-joints can hardly be seen.

Chemical wood preservative

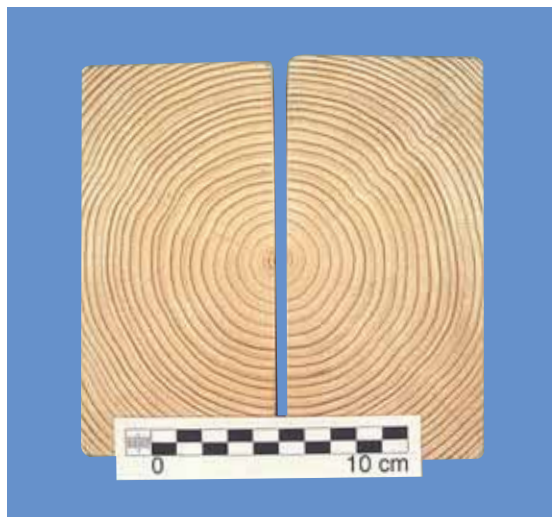
With a permanently low wood moisture content of $15\% \pm 3\%$ there is no danger – subject to the wider construction conditions - of KVH® being infested by wood-destroying mould.

Moreover, thanks to the kiln drying process based now on many years of practical experience, there have also been no incidences of damage by insects.

The kiln drying of the timber is therefore an indispensable precondition for doing without chemical wood preservative.



Free of heart conversion



Clear-heart conversion



Finger-jointing

CROSS-SECTIONS AND DIMENSIONS

Preferred cross-sections

KVH® is produced in preferred cross-sections. These cross-sections permit the realization of the majority of structures associated with modern timber construction. The advantages of standardized cross-sections are:

- Economic production
- Holding as stock on hand
- Short delivery times
- Easier planning and realization thanks to standardized joints and connections

Width w (mm)	Height h (mm)	100	120	140	160	180	200	240
60		■	■	■	■	■	■	■
80			■	■	■	■	■	■
100		■			■	■	■	■
120			■		■		■	■
140				■				■

■ = Preferred cross-section

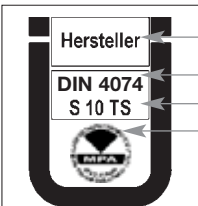

The high quality standards of KVH® also apply to the production of other cross-sections. For larger cross-sections it is advisable to use DUO/TRIO beams*.

Definitions of assortments

Standard	Package comprising a single cross-section and quality in a defined packaged unit.
Single pieces	Single pieces or packages comprising a precise assembly of pieces from the standard range.
System lengths	Package in a system length, e.g. 6 m, 7 m, 7.5 m, 8 m, 8.5 m, 9 m, in a standard dimension and standard quality (NSi, Si).
List	An optimized package of timber cut to a special dimension as listed with diverse cross-sections in multiple lengths, with or without off-cut lengths on agreement.
Custom-tailored lengths	Diverse standard cross-sections in any desired lengths and qualities; precisely fitting trimmed pieces.

Identifying markings

KVH® must bear details of the producer and the strength class. Finger-jointed KVH® must also bear the details required by EN 385 and the certified inspection organization commissioned with the inspections.

	<p>Manufacturer</p> <p>DIN standard</p> <p>Sorting class</p> <p>Logo of the certification organization</p>		<p>Manufacturer</p> <p>DIN standard</p> <p>Sorting class</p> <p>Logo of the certification organization</p>
KVH® without finger-jointing		KVH® with finger-jointing	

SORTING CRITERIA

Sorting characteristics and criteria for KVH®

Sorting criteria	Requirements of KVH®		Comments
	Exposed KVH®-Si	Non-exposed KVH® Nsi	
Sorting class/ strength class	DIN 4074-1 Minimum grade S10 TS Min. C 24 according to EN 338	DIN 4074-1 Minimum grade S10TS Min. C 24 accord- ing to EN 338	The material properties that determine load-bearing capacity are derived from EN 338.
Wood moisture content	15% ± 3%	15% ± 3%	The defined wood moisture content is the precondition for applications where chemical wood preservative should not be used as far as possible. It can also be the precondition for the production of finger-joint connections.
Type of conversion	Clear-heart Free of heart on request	Clear-heart	Clear-heart: Since the pith in the clean bole does not always run through the middle, clear-heart is defined as follows: In an ideally formed clean bole the pith is cut through when converted from both sides. Free of heart: Core plank of at least 40 mm in thickness.
Wane	Not permitted	Measured at an angle ≤ 10% of the smaller cross- section side	
Dimensional tolerance of the cross-section	DIN EN 336, dimensional stability class 2 ≤10 cm = ± 1 mm, >10 cm = ± 1.5 mm		The dimensional tolerance for the longitu- dinal dimensions is to be agreed between the supplier and customer.
Knot condition	Loose and fallen knots not permitted: Occasional faulty knots or parts of knots permitted with max. diameters of 20 mm.	DIN 4074-1 ¹⁾ Grade S10	
Knotting	S10: A ≤ 2/5 S13: A ≤ 1/5 Not over 70 mm	S10: A ≤ 2/5 S13: A ≤ 1/5 Not over 70 mm	Knotting A is determined according to DIN 4074-1. For machine-based sorting the following applies: - for KVH®-NSi the sizes of the knots are irrelevant. - for KVH®-Si: A ≤ 2/5.
Ingrown bark	Not permitted	DIN 4074-1 ¹⁾	
Cracks and radial cracks caused by shrinking (drying cracks)	Width of crack w ≤ 3% of the cross-section side, subject to max. of 6 mm.	DIN 4074-1 ¹⁾	
Resin gall	Width w ≤ 5 mm	–	
Discoloration	Not permitted	DIN 4074-1 ¹⁾	
Insect attack	Not permitted	DIN 4074-1 ¹⁾	
Twisting	–	–	The permitted degree of twisting is not defined in any more detail since no unacceptable degrees of twisting are to be expected if all other criteria are met.
Longitudinal warping	For clear-heart conversion ≤ 8 mm/2 m For free of heart conversion ≤ 4 mm/2 m	For clear-heart conversion ≤ 8 mm/2 m	By comparison: DIN 4074-1, S 10 and S 13: ≤ 8 mm/2 m
Working of the ends	Trimmed at right-angles		
Surface finish	Planed and chamfered	Sized and chamfered	
Finger-jointing	DIN 68140-1 bzw. DIN EN 385		

1) The German standard DIN 4074-1, "Grading of timber by strength – Part 1: Softwood" sets out grading characteristics and classes as preconditions for the specification and use of characteristic values for the calculation of limit states of strength and performance capability. It meets the requirements of the European standard DIN EN 14081-1 "Timber buildings – Construction timber graded by strength for load-bearing applications with right-angled cross-sections – Part 1: General requirements".

2) The grade S 10 equates to strength class C 24 according to EN 338, "Construction timber for load-bearing applications – Strength classes".

QUALITY CONTROLS AND IDENTIFICATION MARKINGS

Quality controlled production



The high requirements made of KVH® as a construction product are reflected in the production practices of the sawmills. They have formed the Organization for the Quality Control of Solid Structural Timber in Germany.

The production of KVH® solid structural timber is subject to strict quality controls. These controls consist of the initial inspection of the company and permanent internal controls and regular external inspections. The initial inspection and external inspections are performed by independent certified inspection organizations.

The award of the KVH® compliance mark therefore shows that compliance with the quality and inspection requirements has been confirmed by external inspections.

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