

KVH® by Lignopan

Solid structural timber:

The solution for modern and discerning timber construction

The safest and easiest way to ensure using the correct timber for modern timber structures is to use KVH® structural timber.

In collaboration with the Association of German Carpenters (*Bund Deutscher Zimmermeister – BDZ*) in the Central Association of the German Building Trade (*Zentralverband des Deutschen Baugewerbes e. V.*), the Supervisory Board for Structural Timber (*Überwachungsgemeinschaft Konstruktionsvollholz e. V.*) has drafted requirements and defined these in an agreement to form the basis for production and supply.

KVH® structural timber, therefore, complies with additional requirements which exceed the general building inspectorate guidelines.

KVH® structural timber is a technically-dried, strength-graded and generally finger-jointed solid wood product made from softwood (mainly spruce) and designed for a wide variety of applications in modern timber construction. Alternative types of softwood are also available for special uses such as thresholds or outdoor areas not directly exposed to the elements.

Precisely defined product characteristics, requests for filigree supporting frameworks and aesthetically sophisticated surfaces, as well as fast delivery times to the location also speak for the use of KVH®.

- Meets increased requirements in comparison to standard solid wood
- Attractive solid wood appearance with different surfaces
- Finger-jointing enables the production of lengths of up to 16.00 m
- Preferred dimensions are held in stock and are therefore readily available
- Customised production is possible at short notice, e.g. “custom order KVH® structural timber”
- Superior dimensional stability due to technical drying process
- Free from substances that pose a health risk

Overview of product features

KVH® structural timber by Lignopan is a quality-controlled product with clearly defined characteristics that satisfy the requirements of DIN EN 15497:2014 (for finger-jointed solid wood) and DIN EN 14081-1 (for non-finger-jointed solid wood).

Depending on the intended use, we manufacture two ranges which essentially differ only in terms of their visual appearance:

- **KVH®-Si for visible structures**
- **KVH®-NSi for non-visible structures**

Regarding the grading process — a crucial requirement for ensuring the appropriate use of KVH® structural timber in construction — the timber is subject to quality criteria which significantly exceed those stipulated for customary sawn structural timber. Sorting takes place in accordance with EN 14081 and DIN 4074-1 and is monitored externally.

In addition to the requirements set by these standards, the following grading criteria are also met:

- **defined wood moisture content**
- **type of cut (free of heart)**
- **dimensional stability of the cross-sections**
- **surface properties**

Please refer to all grading characteristics and conditions in the Quality Criteria table.

Dimensional stability through the technical drying process

To minimise the deformation of timber and the associated adverse effects on structures caused by shrinking and swelling, an average wood moisture content of $15\% \pm 3\%$ has been set for KVH® structural timber. At Lignopan, this value is precisely set by a technical drying process in computer-controlled drying kilns, and each individual piece of timber is checked prior to processing.

Variable lengths achieved through finger-jointing

Finger-jointing enables lengths of up to 16.00 m of timber to be produced. The process involves bonding together individual sections without this affecting the strength value of the whole component.

Adhesives used

KVH® structural timber by Lignopan is also ecologically sound! It is bonded with formaldehyde-free adhesives and is therefore toxicologically harmless and environmentally friendly.

KVH® structural timber area of application

Finger-jointed KVH® structural timber may be used in usage classes 1 and 2 in accordance with DIN EN 1995-1-1 in structures which are not subject to fatigue. Non-finger-jointed KVH® structural timber may also be used in usage class 3.



Standard dimensions

KVH® structural timber is produced in standard cross-sections to cover virtually all the requirements of modern timber construction.

The advantages of standardisation for trade and the wood processing industry speak for themselves:

- **produced as stock**
- **economic planning and construction**

For this purpose, the end of every piece of timber can be labelled, showing the component number(s), cross-section, length, and other details.

In addition, the plant in Pfarrkirchen is optimised for maximum flexibility. Custom customer orders can be produced quickly and accurately and are trimmed if required.

Whether you require a standard, trimmed or custom order, you decide which of the available versions is best suited to your purposes.

Lignopan solid wood as well as laminated beams, duo-beams and trio-beams are available in a wide range of dimensions in addition to those shown in the table below.

Standard length: 5 m, 13 m (up to 16 m possible), type of wood: spruce, weight per package: max. 3 tons

		Height mm											
		60	80	100	120	140	160	180	200	220	240	260	280
Width mm	40 Units/ Pack	■ 180 ¹	■ 130 ²	■ 110 ²	■ 90 ²	■ 80 ²	■ 70 ²	■ 60 ²	■ 50 ²	■ 50 ²	■ 40 ²		
	50 Units/ Pack		■ 104 ³	■ 88	■ 72	■ 64	■ 56	■ 48 ³	■ 40	■ 40 ³	■ 32		
	60 Units/ Pack	■ 126 ¹	■ 91	■ 77	■ 63	■ 56	■ 49	■ 42	■ 35	■ 35	■ 28	■ 28	■ 28
	80 Units/ Pack		■ 65	■ 55	■ 45	■ 40	■ 35	■ 30	■ 25	■ 25	■ 20	■ 20	■ 20
	100 Units/ Pack			■ 44	■ 36	■ 32	■ 28	■ 24	■ 20	■ 20	■ 16	■ 16	■ 16
	120 Units/ Pack				■ 27	■ 24	■ 21	■ 18	■ 15	■ 15	■ 12	■ 12	■ 12
	140 Units/ Pack					■ 24	■ 21	■ 18	■ 15	■ 15	■ 12		

1) Dimensions 40 × 60 mm and 60 × 60 mm only possible in standard length 5.00 m, not S10TS/C24 sorted.

2) Dimensions 40 × 80/100/140/180 mm only with calculation dimension 43 mm.

3) Dimensions 50 × 80/180/220 mm only with calculation dimension 53 mm.

Other dimensions possible from a production point of view, but only on request; visible quality in preferred dimensions possible.

Quality Criteria

Grading criterion	Requirement to be met by KVH®-Si	Requirement to be met by KVH®-NSi	Remarks
Technical standard	DIN EN 15497:2014 DIN EN 14081-1	DIN EN 15497:2014 DIN EN 14081-1	Finger-jointed solid wood Non-finger-jointed solid wood
Strength class according to DIN EN 338	At least C24	At least C24	The strength, rigidity and bulk density properties decisive for the load-bearing capacity are derived for dimensioning purposes according to Eurocode 5 from DIN EN 338, table 1 and DIN EN 1995-1-1/NA
Grading standard for visual grading	DIN 4074-1	DIN 4074-1	The elastomechanical properties according to DIN EN 338 can be found in the data sheets on laminated and glued products.
Wood moisture content	15% ± 3% Technically dried: timber which is dried in a suitable, process-controlled plant at a temperature of T ≥ 55°C for at least 48 hours to a wood moisture content of u ≤ 20%.	15% ± 3% Technically dried: timber which is dried in a suitable, process-controlled plant at a temperature of T ≥ 55°C for at least 48 hours to a wood moisture content of u ≤ 20%.	The specified wood moisture content is a prerequisite for dispensing, for the most part, with preservative treatments, and can also be the precondition for finger-joint assembly.
Type of cut	The incision is made taking into account that with an ideally grown trunk, the pith is cut through with a two-stem incision.		
Wane in accordance with DIN 4074-1	Not permitted	≤ 10% of the smaller cross-section side	
Dimensional stability of the cross-section	DIN EN 336 Dimensional stability class 2: w ≤ 100 mm: ±1.0 mm w > 100 mm: ±1.5 mm	DIN EN 336 Dimensional stability class 2: w ≤ 100 mm: ±1.0 mm w > 100 mm: ±1.5 mm	The dimensional stability for the longitudinal dimensions must be agreed between the customer and supplier.
Knot condition	Loose knots and dead knots are not permitted. Occasional faulty knots or parts of knots up to max. 20 mm in diameter are permitted.	DIN 4074-1 Grading class S10	Replacement with natural wood dowels is permitted.
Knot diameter ratio	S10: $A \leq \frac{2}{5}$ Not exceeding 70 mm	S10: $A \leq \frac{2}{5}$ Not exceeding 70 mm	Knot diameter ratio A is determined in accordance with DIN 4074-1. The following applies to mechanical grading: • Knot sizes are not taken into consideration for KVH®-NSi. • For KVH®-Si, $A \leq \frac{2}{5}$ applies.



Requirements to be met by KVH® structural timber in accordance with the inspection regulations and the agreement between the Association of German Carpenters (Bund Deutscher Zimmermeister – BDZ) and the Supervisory Board for Structural Timber (Überwachungsgemeinschaft Konstruktionsvollholz e. V.).

Grading criterion	Requirement to be met by KVH®-Si	Requirement to be met by KVH®-NSi	Remarks
Ingrown bark	Not permitted	DIN 4074-1	
Cracks, radial shrinkage cracks (dry cracks)	Width of the crack $w \leq 3\%$ of the respective cross-section width	Crack width $\leq 5\%$	Crack width b related to the respective cross-section side without limitation of the length or the number of cracks. The requirements of the building authorities regarding the crack depth must be observed.
Crack depth (shrinkage cracks)	Up to $\frac{1}{2}$ of the wood thickness permitted	Up to $\frac{1}{2}$ of the wood thickness permitted	
Cracks caused by lightning, ring shakes	Not permitted	Not permitted	
Resin pockets	Width $w \leq 5$ mm		Additional criterion
Discolourations	Not permitted	Blue: permitted Brown and white rot: not permitted	For Si, the requirements are stricter than those applicable to grading class S10 in accordance with DIN 4074-1.
Insect damage	Not permitted	Burrows up to 2mm diameter permitted	For Si, the requirements are stricter than those applicable to grading class S10 in accordance with DIN 4074-1.
Twisting	DIN 4074-1	DIN 4074-1	The permissible extent of twisting is not specified in further detail as no unacceptable twisting should be expected if all the other criteria are complied with.
Longitudinal warping	For free of heart cutting: ≤ 8 mm/2 m For heart-free cutting: ≤ 4 mm/2 m	For free of heart cutting: ≤ 8 mm/2 m	In comparison: According to DIN 4074-1 S10: ≤ 8 mm/2 m
Finishing of the ends	Trimmed perpendicular	Trimmed perpendicular	
Surface properties	Planed and chamfered	Levelled and chamfered	
Packaging	Packages wrapped over four sides in green film; upon request Si-quality individual beams can be wrapped in (black) film	Packages wrapped over four sides in green film	Additional feature for KVH® by Lignopan
Marking	All grades are signed on one side (inkjet printer).		Additional feature for KVH® by Lignopan
Certificates	All Lignopan certificates can be sent on request.		



Custom order KVH®

The wide range of standard dimensions, with widths starting from 60 mm and heights of up to 280 mm, meet most of the general requirements for KVH® structural timber. Standardised lengths of 13.00 m ensure comprehensive, short-term availability, while allowing the customised use of stock items for any desired cut length. In addition, it can be beneficial and more economical to use custom order KVH® structural timber for certain areas of application. For this purpose, the lengths can be produced quickly and accurately, and trimmed and packaged (with right alignment) according to customer requirements. This eliminates the need for order picking or repackaging in carpentry shops or interim storage facilities, as the timber required for a specific project is directly available without loss of length or loss of time.

Individual pieces of timber are optimised in terms of length and, if required, joined together in multiple lengths, whereby the possible lengths of individual pieces of timber range between 3.00 and 16.00 m. Detailed information about package content and, where applicable, the multiple lengths of joined individual beams is printed on labels on the end of every piece of timber, as well as on the packaging label.

A range of available special dimensions and intermediate dimensions, proven production processes, individual delivery cycles agreed upon with customers, and the entire KVH® structural timber product range leave little to be desired.

KVH® Range

KVH® standard:

Package consisting of one cross-section and one grade in a defined packaging unit.

KVH® system lengths:

Package with one system length (for example 7.00 m, 7.50 m, 8.00 m, 8.50 m or 9.00 m) with uniform dimension and quality (NSi, Si).

Custom order KVH®:

Optimised list of different cross-sections available in multiple lengths.

Produced according to DIN EN 15497:2014 (finger-jointed solid wood) and EN 14081-1 (non-finger-jointed solid wood)



Lignopan Holzwerke Pfarrkirchen GmbH

Max-Breiherr-Str. 20, DE-84347 Pfarrkirchen

Tel: +49 8561 3005 0, Email: info@lignopan.eu

www.lignopan.eu