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## binderholz **NATURE IN ARCHITECTURE**

### **WOOD - AN INTELLIGENT RAW MATERIAL**

Wood is a fascinating, versatile and intelligent material that plays an important role for us humans in many different ways. In addition to its important role as a provider of well-being, protection and wood as a natural raw material the young tree in the forest fulfils another valuable function: it extracts harmful CO<sub>2</sub> from the air, binds carbon C and releases oxygen O<sub>2</sub> into the atmosphere.

Wood has a broad and fascinating range of uses. Whether as a simple wooden spoon, a musical instrument, object of art, furniture, heat and energy provider or as a high-tech product for solid wood structures, we come into contact with this unique raw material every day. The characteristics of this intelligent material are reflected in its load-bearing capacity, durability, stability and fire resistance, to name but a few. Wood also has a positive influence on the well-being of humans and therefore on their health.

### **BENEFITS OF GLULAM GLT**

uncomplicated | fast | light | stable

**load-bearing capacity • dimensional stability**  
**short construction times • low weight • high value surface quality**  
**high level of prefabrication • large variety of shapes**  
**small component dimensions with high strength levels**  
**architectural and constructional versatility**





## BINDERHOLZ GLULAM GLT

binderholz is a full-range supplier for glulam products. Its core competence lies in the production of straight as well as special shaped beams. Glulam consists of at least 3 timber lamellas glued parallel to the grain. Through grading by strength and homogenization of the timber lamellas, a high level of load-bearing capacity is achieved in comparison to common construction timber. High load-bearing capacity, dimensional stability, product variety and excellent surface quality allow for a broad range of application options in the area of construction.

## GLULAM GLT QUALITIES

Quality features - Glulam in compliance to EN 14080		
Grade	visible quality	industrial quality
Surface	planed on 4 sides, chamfered	planed on 4 sides, chamfered, rough areas permitted in some cases
Insect attack	permitted up to 2 mm	permitted to a minor degree
Pith	permitted	permitted
Discoloration Blue stain / red streak	in principle free of color defects, up to 10% of the surface permitted	permitted
Resin pocket	permitted up to 5 mm width	permitted
Intergrown knots	permitted	permitted
Black knots	permitted	permitted
Fallen-out knots	permitted up to 20 mm	permitted up to 20 mm
Pin knots	permitted	permitted

## GLULAM GLT CATEGORIES ACCORDING TO EN 1995-1-1

**Category 1:** This category is characterized by a moisture content in the materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air exceeding the value of 65% only for a few weeks annually (heated inside space).

**Category 2:** This category is characterized by a moisture content in the materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air exceeding the value of 85% only for a few weeks annually (protected outside space).

**Category 3:** This category is characterized by climate conditions that result in higher levels of moisture contents than in category 2 (unprotected outside space); melamine resin admissible / 33 mm lamella required.

## GLULAM GLT TECHNICAL DATA

	GL 24	GL 28	GL 30	GL 32*
<b>Assembly</b>	combined (c) / homogeneous (h)			
<b>Wood Species</b>	spruce			
<b>Manufacture</b>	in accordance with EN 14080			
<b>Moisture content</b>	9 - 14 %			
<b>Mechanical grading</b>	in accordance with EN 14081-3			
<b>Lamella thickness</b>	40 mm			
<b>Gluing</b>	modified melamine resin, light, non-darkening joints			
<b>Surface quality</b>	planed on 4 sides, chamfered edges, visible quality, industrial quality			
<b>Packaging</b>	in packets, can be individually wrapped on request			
<b>External monitoring</b>	Holzforschung Austria			
<b>Calculatory combustion behavior</b>	0,7 mm / min			
<b>Emission category</b>	< E1 according to EN 14080, test reports on request			
<b>Fire behavior</b>	D-s2, d0			
<b>Dimension tolerance</b>	width $\pm$ 2 mm height $\pm$ 2 mm length $\pm$ 0,1 %			
<b>Change in shape</b>	axially: 0,01 - 0,02 % per % change in moisture content radially: 0,19 % per % change in moisture content tangentially: 0,34 % per % change in moisture content			
<b>Heat conductivity</b>	0,13 W/mk			
<b>Water vapor resistance coefficient</b>	$\mu = 40$			

\* on request

## GLULAM GLT SPECIFIC VALUES FOR DIMENSIONING EN 1995-1-1:2010-12, EN 14080:2013

Component	Combined glulam				Homogeneous glulam			
	GL 24c	GL 28c	GL 30c	GL 32c*	GL 24h	GL 28h*	GL 30h*	GL 32h *
<b>Strength class</b>	GL 24c	GL 28c	GL 30c	GL 32c*	GL 24h	GL 28h*	GL 30h*	GL 32h *
<b>Strength values (N/mm<sup>2</sup>)</b>								
<b>Deflection (<math>f_{m,g,k}</math>)</b>	24	28	30	32	24	28	30	32
<b>Tension: parallel (<math>f_{t,0,g,k}</math>)</b>	17	19,5	19,5	19,5	19,2	22,3	24	25,6
<b>Tension: at right angles (<math>f_{t,90,g,k}</math>)</b>	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
<b>Pressure: parallel (<math>f_{c,0,g,k}</math>)</b>	21,5	24	24,5	24,5	24	28	30	32
<b>Strength values (N/mm<sup>2</sup>)</b>								
<b>Modulus of elasticity: parallel (<math>E_{0,g,mean}</math>)</b>	11.000	12.500	13.000	13.500	11.500	12.600	13.600	14.200
<b>Modulus of elasticity: at right angles (<math>E_{90,g,mean}</math>)</b>	300	300	300	300	300	300	300	300
<b>Shear modulus: <math>G_{g,mean}</math></b>	650	650	650	650	650	650	650	650
<b>Density characteristic values (kg/m<sup>3</sup>)</b>								
<b>Density <math>\rho_{g,k}</math></b>	365	390	390	400	385	425	440	440

\* on request



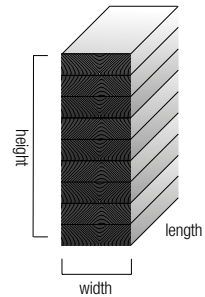
## GLULAM GLT STANDARD

Glulam is manufactured as standard units, in any length, dimension, strength class and surface quality based on customer requirements.

<b>Wood Species</b>	spruce
<b>Quality</b>	visible quality, industrial quality
<b>Strength classes</b>	GL 24c, GL 24h, GL 28c, GL 28h, GL 30c, GL 30h*, GL 32c*, GL 32h*
<b>Surface and finger joint gluing</b>	modified melamine resin, for categories 1-2, UV-proof and weatherproof, light
<b>Width</b>	60 - 280 mm** (in 20 mm steps)
<b>Height</b>	up to 1.280 mm (in 40 mm steps)
<b>Length</b>	6 - 18 m
<b>Cut to length</b>	3.5 - 18 m

\* only visible quality

\*\* width 60 mm is split; only in GL 24 available  
width 280 mm in GL 24 available, in GL 28c on request



## GLULAM GLT PRODUCTS FROM FINLAND

<b>Product</b>	POST, BEAM, DODAI
<b>Wood Species</b>	pine
<b>Dimensions</b>	90 x 90 mm   90 x 140 mm   105 x 105 mm   120 x 120mm
<b>Length</b>	2650 - 4985 mm
<b>Dimensions</b>	105/120 x 105/120/150/180/210/240/270/300/330/360/390 mm
<b>Length</b>	2750 - 4985 mm
<b>Glue type</b>	MELAMIN (MF) or RESORCINOL (PRF)
<b>Machining</b>	planed on 4 sides, KD 12%
<b>Certification</b>	JAS



# GLULAM GLT DIMENSIONING

## Single span beams

Maximum span (m)

In compliance with admissible bending stresses and the L/300 limitation of deflection as well as the maximum transverse force on the support.

Height (mm)	Width (mm)	Load (kN/m)																		
		2,00	2,50	3,00	3,50	4,00	4,50	5,00	6,00	7,00	8,00	9,00	10,00	11,00	12,00	15,00	20,00	25,00	30,00	
120	60	2,29	2,12	2,00	1,89	1,77	1,67	1,59	1,45	1,34	1,26	1,18	1,12	1,04	0,96	0,77	0,57	0,46	0,38	
	80	2,51	2,34	2,20	2,09	2,00	1,92	1,83	1,67	1,55	1,45	1,37	1,30	1,24	1,18	1,02	0,77	0,61	0,51	
	100	2,70	2,51	2,37	2,25	2,15	2,07	2,00	1,87	1,73	1,62	1,53	1,45	1,38	1,32	1,18	0,96	0,77	0,64	
	120	2,86	2,66	2,51	2,39	2,29	2,20	2,12	2,00	1,89	1,77	1,67	1,59	1,51	1,45	1,30	1,12	0,92	0,77	
160	60	3,04	2,83	2,66	2,52	2,36	2,23	2,11	1,93	1,79	1,67	1,58	1,50	1,39	1,27	1,02	0,77	0,61	0,51	
	80	3,34	3,11	2,93	2,78	2,66	2,56	2,44	2,23	2,06	1,93	1,82	1,73	1,65	1,58	1,36	1,02	0,82	0,68	
	100	3,59	3,34	3,15	2,99	2,87	2,76	2,66	2,49	2,30	2,16	2,03	1,93	1,84	1,76	1,58	1,27	1,02	0,85	
	120	3,80	3,54	3,34	3,18	3,04	2,93	2,83	2,66	2,52	2,36	2,23	2,11	2,02	1,93	1,73	1,50	1,22	1,02	
160	160	4,17	3,88	3,66	3,49	3,34	3,21	3,11	2,93	2,78	2,66	2,56	2,44	2,32	2,23	1,99	1,73	1,55	1,36	
	80	4,16	3,88	3,65	3,47	3,33	3,20	3,04	2,78	2,57	2,41	2,27	2,16	2,06	1,97	1,70	1,27	1,02	0,85	
	100	4,47	4,16	3,93	3,74	3,58	3,44	3,33	3,10	2,87	2,69	2,54	2,41	2,30	2,20	1,97	1,59	1,27	1,06	
	120	4,74	4,41	4,16	3,96	3,80	3,65	3,53	3,33	3,14	2,94	2,78	2,64	2,52	2,41	2,16	1,87	1,53	1,27	
200	140	4,97	4,63	4,37	4,16	3,99	3,84	3,71	3,50	3,33	3,18	3,00	2,85	2,72	2,60	2,33	2,02	1,78	1,49	
	160	5,18	4,83	4,56	4,35	4,16	4,01	3,88	3,65	3,47	3,33	3,20	3,04	2,90	2,78	2,49	2,16	1,93	1,70	
	200	5,55	5,18	4,90	4,66	4,47	4,31	4,16	3,93	3,74	3,58	3,44	3,33	3,22	3,10	2,78	2,41	2,16	1,97	
	80	4,98	4,64	4,38	4,16	3,99	3,83	3,64	3,33	3,09	2,89	2,73	2,59	2,47	2,36	2,03	1,53	1,22	1,02	
240	100	5,35	4,98	4,70	4,47	4,29	4,13	3,99	3,72	3,44	3,23	3,04	2,89	2,76	2,64	2,36	2,02	1,91	1,53	1,27
	120	5,66	5,28	4,98	4,74	4,55	4,38	4,23	3,99	3,77	3,53	3,33	3,16	3,02	2,89	2,59	2,24	1,83	1,53	
	140	5,94	5,54	5,23	4,98	4,78	4,60	4,45	4,19	3,99	3,81	3,59	3,41	3,25	3,12	2,79	2,42	2,14	1,78	
	160	6,19	5,78	5,46	5,20	4,98	4,80	4,64	4,38	4,16	3,99	3,83	3,64	3,48	3,33	2,98	2,59	2,32	2,03	
240	180	6,41	5,99	5,66	5,40	5,17	4,98	4,82	4,55	4,33	4,14	3,99	3,85	3,68	3,53	3,16	2,74	2,46	2,24	
	200	6,62	6,19	5,85	5,58	5,35	5,15	4,98	4,70	4,47	4,29	4,13	3,99	3,86	3,72	3,33	2,89	2,59	2,36	
	100	6,22	5,80	5,47	5,21	4,99	4,81	4,65	4,33	4,01	3,76	3,55	3,37	3,21	3,08	2,76	2,22	1,78	1,49	
	120	6,58	6,14	5,80	5,52	5,29	5,10	4,93	4,65	4,39	4,11	3,88	3,68	3,52	3,37	3,02	2,62	2,14	1,78	
280	140	6,90	6,44	6,09	5,80	5,56	5,36	5,18	4,88	4,65	4,43	4,18	3,97	3,79	3,63	3,25	2,82	2,49	2,08	
	160	7,18	6,71	6,35	6,05	5,80	5,59	5,40	5,10	4,85	4,65	4,47	4,24	4,05	3,88	3,48	3,02	2,70	2,37	
	180	7,44	6,96	6,58	6,28	6,02	5,80	5,61	5,29	5,04	4,83	4,65	4,49	4,29	4,11	3,68	3,20	2,86	2,62	
	200	7,67	7,18	6,80	6,48	6,22	6,00	5,80	5,47	5,21	4,99	4,81	4,65	4,50	4,33	3,88	3,37	3,02	2,76	
320	120	7,49	7,00	6,61	6,30	6,04	5,82	5,62	5,30	5,01	4,69	4,43	4,21	4,01	3,84	3,44	2,99	2,44	2,03	
	140	7,85	7,34	6,94	6,61	6,34	6,11	5,91	5,57	5,30	5,06	4,77	4,53	4,33	4,15	3,72	3,22	2,84	2,37	
	160	8,17	7,64	7,23	6,89	6,61	6,37	6,16	5,82	5,53	5,30	5,10	4,84	4,62	4,43	3,97	3,44	3,08	2,71	
	180	8,46	7,92	7,49	7,15	6,86	6,61	6,40	6,04	5,75	5,51	5,30	5,12	4,89	4,69	4,21	3,65	3,27	2,99	
320	200	8,72	8,17	7,74	7,38	7,09	6,83	6,61	6,24	5,94	5,70	5,48	5,30	5,14	4,94	4,43	3,84	3,44	3,15	
	120	8,40	7,85	7,42	7,07	6,78	6,53	6,32	5,96	5,62	5,27	4,97	4,73	4,51	4,32	3,87	3,36	2,74	2,29	
	140	8,80	8,23	7,78	7,42	7,12	6,86	6,63	6,26	5,96	5,68	5,36	5,09	4,86	4,66	4,18	3,62	3,19	2,67	
	160	9,15	8,57	8,11	7,73	7,42	7,15	6,92	6,53	6,22	5,96	5,72	5,44	5,19	4,97	4,46	3,87	3,47	3,04	
360	180	9,47	8,87	8,40	8,02	7,70	7,42	7,18	6,78	6,46	6,19	5,96	5,76	5,50	5,27	4,73	4,10	3,68	3,36	
	200	9,75	9,15	8,67	8,28	7,95	7,67	7,42	7,01	6,68	6,40	6,16	5,96	5,78	5,55	5,07	4,32	3,87	3,54	
	120	9,30	8,70	8,22	7,84	7,52	7,24	7,01	6,61	6,24	5,85	5,52	5,24	5,01	4,80	4,30	3,73	3,04	2,54	
	140	9,73	9,11	8,62	8,22	7,89	7,61	7,36	6,94	6,61	6,30	5,95	5,65	5,40	5,17	4,64	4,02	3,54	2,96	
400	160	10,12	9,48	8,98	8,57	8,22	7,93	7,67	7,24	6,90	6,61	6,35	6,03	5,76	5,52	4,95	4,30	3,85	3,38	
	180	10,46	9,81	9,30	8,88	8,53	8,22	7,96	7,52	7,16	6,86	6,61	6,39	6,10	5,85	5,24	4,55	4,08	3,73	
	200	10,78	10,12	9,60	9,17	8,81	8,49	8,22	7,77	7,40	7,10	6,84	6,61	6,41	6,15	5,52	4,80	4,30	3,93	
	120	10,19	9,54	9,02	8,61	8,26	7,96	7,70	7,26	6,85	6,42	6,06	5,76	5,50	5,27	4,72	4,10	3,34	2,79	
440	140	10,66	9,99	9,46	9,02	8,66	8,35	8,08	7,63	7,26	6,92	6,54	6,21	5,93	5,68	5,10	4,42	3,89	3,25	
	160	11,08	10,39	9,84	9,40	9,02	8,70	8,42	7,96	7,58	7,26	6,97	6,62	6,33	6,06	5,44	4,72	4,23	3,71	
	180	11,45	10,75	10,19	9,74	9,35	9,02	8,74	8,26	7,86	7,54	7,26	7,01	6,70	6,42	5,76	5,01	4,49	4,10	
	200	11,79	11,08	10,51	10,05	9,66	9,32	9,02	8,53	8,13	7,80	7,51	7,26	7,04	6,76	6,06	5,27	4,72	4,32	
480	120	11,08	10,38	9,82	9,37	8,99	8,66	8,38	7,91	7,46	6,99	6,61	6,28	5,99	5,74	5,15	4,47	3,64	3,04	
	140	11,59	10,86	10,29	9,82	9,43	9,09	8,80	8,31	7,91	7,53	7,12	6,77	6,46	6,19	5,55	4,82	4,24	3,54	
	160	12,03	11,29	10,71	10,23	9,82	9,47	9,17	8,66	8,25	7,91	7,59	7,22	6,89	6,61	5,93	5,15	4,62	4,04	
	180	12,43	11,68	11,08	10,59	10,18	9,82	9,51	8,99	8,57	8,21	7,91	7,64	7,29	6,99	6,28	5,46	4,89	4,47	
600	200	12,79	12,03	11,43	10,93	10,50	10,14	9,82	9,29	8,85	8,49	8,18	7,91	7,67	7,36	6,61	5,74	5,15	4,71	
	120	13,71	12,86	12,19	11,64	11,17	10,78	10,43	9,85	9,28	8,71	8,23	7,82	7,47	7,16	6,42	5,58	4,54	3,79	
	140	14,31	13,44	12,75	12,19	11,71	11,30	10,94	10,34	9,85	9,37	8,86	8,42	8,05	7,71	6,92	6,02	5,29	4,42	
	160	14,84	13,96	13,26	12,68	12,19	11,77	11,40	10,78	10,27	9,85	9,44	8,98	8,58	8,23	7,39	6,42	5,76	5,04	
600	180	15,31	14,42	13,71	13,12	12,62	12,19	11,81	11,17	10,66	10,22	9,85	9,50	9,08	8,71	7,82	6,80	6,10	5,58	
	200	15,74	14,84	14,12	13,52	13,01	12,57	12,19	11,54	11,01	10,56	10,18	9,85	9,54	9,15	8,23	7,16	6,42	5,87	

- Transverse force on the support is authoritative.
- The admissible bending stress is authoritative for the dimensioning.
- Bending is authoritative.

## BINDERHOLZ GLULAM GLT CEILING ELEMENTS

Due to the high degree of prefabrication, our glulam GLT ceiling elements can be laid in the shortest possible time to immediately walkable raw ceilings. The underside of the ceiling elements can also be manufactured in visible quality on request. The elements are optimally protected against transport and handling damage by special packaging.

Our state-of-the-art production facilities now also offer these elements with a **sanded surface**.

Our glulam can be used not only for ceilings, but also as a wall and roof element.

<b>Wood Species</b>	spruce
<b>Strength classes</b>	GL 24h*
<b>Surface and finger joint gluing</b>	modified melamine resin, for NKL 1-2, UV-proof and weatherproof, bright
<b>Length</b>	6 - 18 m
<b>Cut to length</b>	3.5 - 18 m

<b>Default width</b>	600, 1,000 and 1,200 mm
<b>Quality</b>	Visible quality, non-view quality
<b>Thickness</b>	60 to 280 mm (in 20 mm increments)
<b>Special widths</b>	from 240 mm (in 40 mm increments)

\* Further strength classes on request

## GLULAM GLT CEILING ELEMENTS | PROFILE VARIANTS

- Glulam GLT ceilings can be made in dimensions from 60 mm to 280 mm - see glulam ceiling profiles for details.
- All ceiling elements are made with a 3 to 4 mm chamfer on the underside.
- The following profile dimensions are based on a 200 mm thick ceiling element. Dimensioning for other thicknesses is available on request.
- On request, matching 3-layer solid wood connection boards with the dimensions 19 x 110 mm can be supplied. Price on request.

Profile variants				
P100	P200	P210	P300	P310
P400	P410	P500	P510	<p>Detail A</p> <p>Detail B</p> <p>connection boards 19 x 110 mm</p>

More information in our glulam GLT ceiling elements brochure



## GLULAM GLT SPECIALITIES

Glulam special components are beams with dimensions that go beyond the standard measurements but also shapes such as pent roof beams, sloped beams with straight bottom cords, curved beams and free shapes. These are available exclusively on request.



### Trimming service and special processing

A broad range of trimming services is on offer, from single cuts right up to constructions ready for assembly. By dint of CNC processing, complex timber joints can be produced efficiently and inexpensively by our trimming machines.

#### Preparation for trimming services

We guarantee expedited processing with the following files: Cadwork (.3d), Dietrich (.zbw), Acis (.sat), Hundegger (.bvn), Krüsi (.btl). It is advisable to include an additional single piece drawing (cadwork .2d or pdf).

**Special gluing** such as screw-press gluing.

**Fasteners** can be premounted or delivered on request.

Traditional fasteners are e.g. dovetail connection

Modern fasteners are e.g. Sherpa connections

#### Impregnation

Laminated beam protection - transparent, non-film forming wood coating agent for transportation and assembly protection

Impregnation - transparent, diluted impregnation for protection against rot, blueness, insects and termites

**Paint coating** possible on request! The paint has to be provided by the customer.

## Additional services

#### Technical advice

**Transport** Organization of abnormal loads, necessary approvals and escort vehicles.

**Implementation planning** can be carried out by our technical team.

**Important!** The production of special components only sets in following the planning confirmation by the customer. Only then can the delivery date be stated.




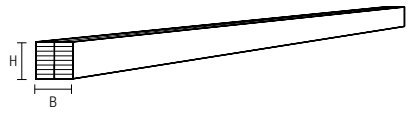
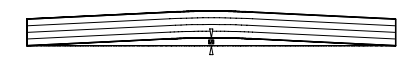
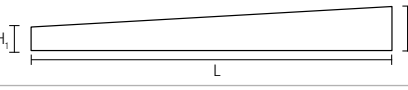
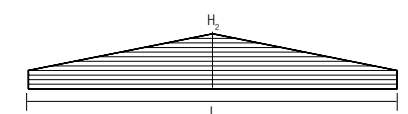
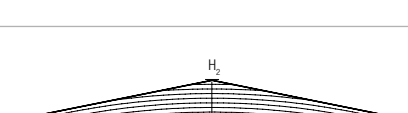
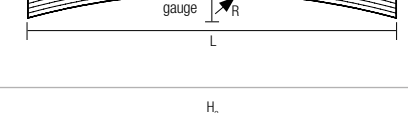
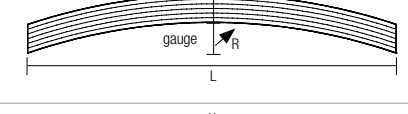
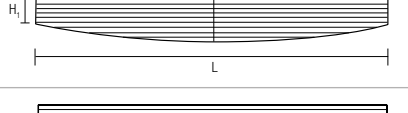



## GLULAM GLT SPECIAL COMPONENTS

<b>Wood species</b>	spruce
<b>Quality</b>	visible quality, industrial quality
<b>Strength classes</b>	GL 24c, GL 24h, GL 28c, GL 28h, GL 30c, GL 30h*, GL 32c*, GL 32h*
<b>Surface and finger joint gluing</b>	modified melamine resin, for categories 1 - 2, UV-proof and weatherproof, light
<b>Width</b>	120 - 480 mm (in 20 mm steps, double glued beams for 300 mm and above)
<b>Height</b>	up to 2,000 mm (in 40 mm steps)
<b>Length</b>	6 - 32,5 m**

\* only visible quality

\*\* with bent glulam elements, the external radian is authoritative

Glulam - special components		Spans (m)	Width (mm)	Height (mm)
<b>Parallel beams</b>		6 - 27 27 - 32,5	120 - 280	max. 2.080 max. 2.000
<b>Double glued beams</b>		6 - 32,5	300-560* wider upon request! max. 6,5t	max. 2.000
<b>Pre-cambered beams</b>		6 - 32,5	120 - 280	max. 1960 L/300 max.100
<b>Pent roof beam</b>		6 - 27 27 - 32,5	120 - 280	H <sub>2</sub> max. 2.080 H <sub>2</sub> max. 2.000
<b>Sloped beams with straight bottom chord</b>		6 - 27 27 - 32,5	120 - 280	H <sub>2</sub> max. 2.080 H <sub>2</sub> max. 2.000 higher with loose ridge wedge possible
<b>Sloped beams with arched bottom chord</b>		6 - 32,5	120 - 280	H <sub>2</sub> max. 1.960 higher with loose ridge wedge possible R ≥ 10 m gauge max. 2,5m
<b>Curved beams</b>		6 - 32,5	120 - 280	H <sub>2</sub> max. 1.960 R ≥ 10 m gauge max. 2,5m
<b>Fish beam</b>		6 - 32,5	120 - 280	H <sub>2</sub> max. 1.960 R ≥ 10 m
<b>Trusses</b>		Available from individual components on request		
<b>Free shapes</b>		6 - 32,5	120 - 280	H max. 1.960 R ≥ 16 m

More shapes can be developed in conjunction with our technical team.

# **IMPORTANT INSTRUCTIONS ON THE HANDLING AND STORAGE OF GLULAM**

## **Packaging, storage and climate conditions**

GLT is always delivered packed in stretch wrap (unless special customer wish is on hand). With regard to glulam elements, the bottommost element in the package is packed facing upward for protection against fork lift forks; all others are packed facing downward. When glulam is stored, it is advisable to protect the wood adequately against weather influences. The stretch wrap or protection foil is nothing more than a short-term transportation protection and cannot deliver long-term protection from UV radiation and rainfall. In general, with regard to storage, it has to be ensured that the moisture content of the glulam beams does not alter negatively on account of disadvantageous influences, e.g. from soil moisture, rainfall or drying up. The storage on the construction site should never be long. The beams have to be stacked on flat supports and/or bed timber. The beams have to be laid out completely flat so as to prevent imprints. Improper storage can result in lasting visual and even static damage to the glulam beams.

## **Manipulation and assembly**

In order to prevent damage to the GLT in the area of edges and surfaces, they have to be handled with great care. Suitable lifting tools and lifting means have to be deployed (harnesses, loops with edge protection, no chains for strapping). Especially when handling the exposed elements, unnecessary soiling of or damage to the surfaces and edges is to be avoided. Once the beams are integrated into the construction, the exposed surfaces have to be continuously protected from soiling and/or damage as well as against moisture influences (e.g. by covering the exposed surface with foil, cardboard and suchlike). Minor damage or soiling cannot always be 100% prevented during loading, transportation and assembly. This does not establish grounds for complaint. Reworking such as planing and other rectifications has to be taken into account already with the offer calculation!

## **Fissures / shrink fissures**

The GLT is delivered with a moisture content of max. 14 %. The fact that wood changes its volume in the hygroscopic range (from 0 to 30 % moisture content) due to swelling and shrinking processes entails that shrink fissures can occur in the wood. This does not establish grounds for complaint.

The wear of wood, especially outside, is enormous due to fluctuations of temperature and humidity. Shrink fissures can occur in glulam wood, although to a much smaller extent than in solid wood. Owing to the varying material behavior of the glued lamellas between glue and wood, the shrink fissures often run parallel to the glue joints. These are not mis-glueings but material-related qualities.

## **Weathering, graying**

If GLT are exposed to weather conditions, degradation products of the lignin destroyed by UV rays will be washed out by rain water. This natural weathering of the wood amounts to an average of 1 mm in 10 years and results in relief formation on the surface of the element. When GLT are used outside, it is principally possible to forgo chemical wood protection. There are some building law regulations in place in this context that demand structural or chemical wood protection. If untreated wood is exposed to weather conditions, the graying process sets in after a few months. The gray coloration and subsequent weathering of the element's surface exposed to the weather do not constitute a technical defect.





# BINDERHOLZ GLULAM GLT

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