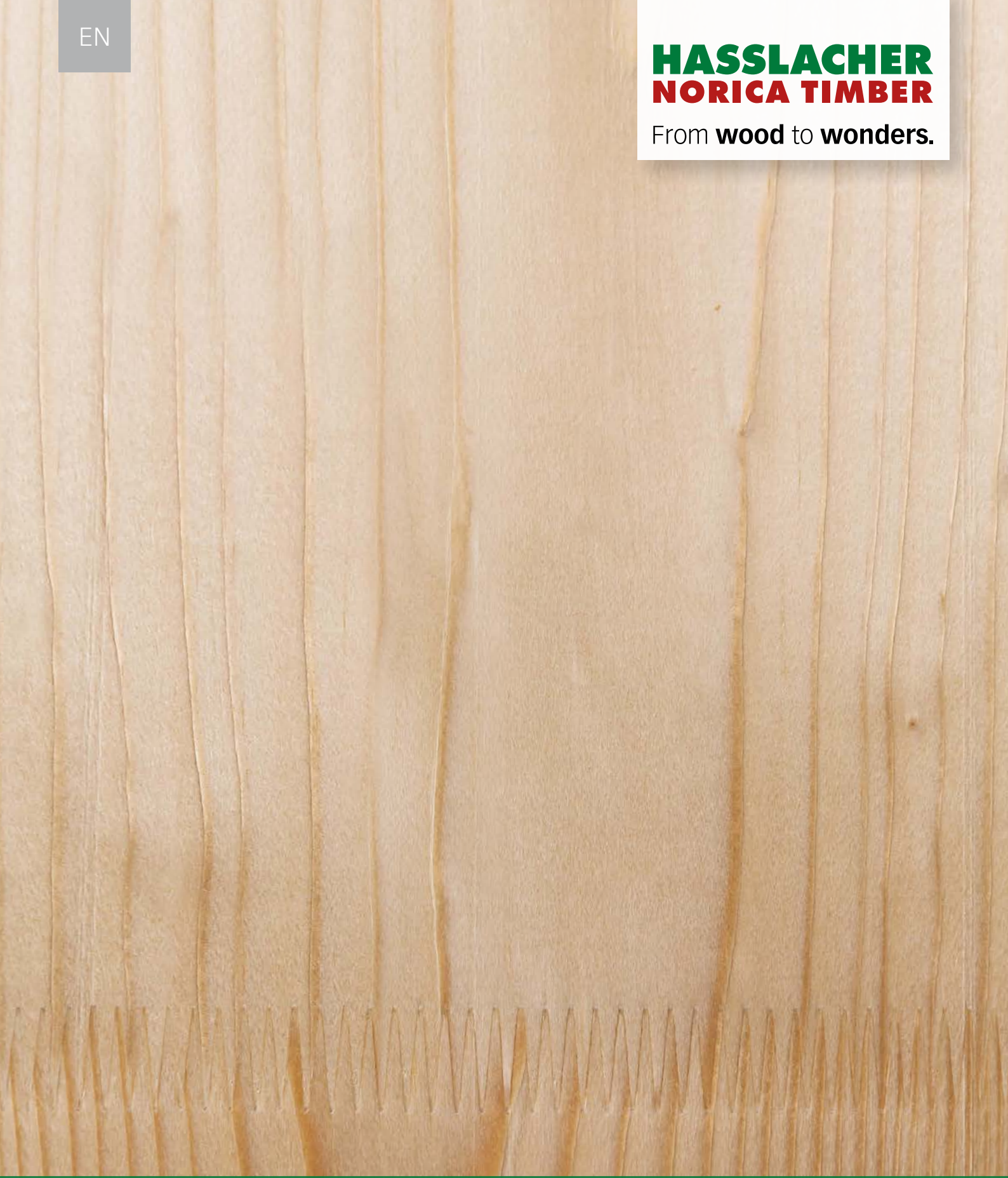
EN

HASSLACHER NORICA TIMBER

From **wood** to **wonders.**



GLT® – Girder Longitudinally Tensiletested

The individually tested safety guarantor.

01
At a glance

Areas of application

- Construction and industrial buildings
- Multi-storey residential buildings
- Single and multiple family houses
- Engineered timber structures

Fields of use

- Rafter-supporting purlins for building halls
- Rafters and purlins for roof structures
- Wooden beam floors, also visually applied
- Highly-stressed bending beams

Advantages

- Volume and cost savings of up to 30%
- Simple structural design, like that of glued laminated timber
- Maximum finger joint safety through tensile test
- CE-labelled according to ETA-13/0644
- High loadbearing capacity with a low density
- Transparent glue line of the finger joint
- Cut to an exact length of up to 18 m
- Covered in conventional design software applications
- Available in visual and industrial quality

02

Overview

Product standard/certification

ETA-13/0644

Tensile proof loading

ETA-13/0644
ON B 4125

Surface qualities

Visual quality
Industrial quality

Maximum cross sections + steps

Heights: 120 to 280 mm in 20 mm steps
Widths: 60 mm to 140 mm in 20 mm steps
Lengths: Standard – 13 m
Specific lengths from 2.50 m up to 18.0 m are possible

Strength classes

GLT®24

Wood species

Spruce/fir

Certification

The current certificates are available in the download area of our website at HASSLACHER.COM.

Sustainability

The HASSLACHER group stands for a careful use of wood as a resource. Our raw materials come from sustainable and controlled forestry. Our locations are certified according to the strict PEFC standards.

PEFC
PEFC/08-32-12
Promoting Sustainable Forest Management
www.pefc.org

03
Your cost advantages

Costs savings through price advantages compared to glued laminated timber

GLT® is the cost-efficient alternative to glued laminated timber. Its loadbearing capacity corresponds to that of glued laminated timber. GLT® can therefore be used as a substitute for this timber product.

Example:

Glued laminated timber GL24	120/240 mm	100%
GLT®24	120/240 mm	80%
Cost advantage		**20%**

Achieving the same performance and loadbearing capacity, you save up to 20% of costs (up to EUR 80 per m³) if compared to glued laminated timber.

Costs savings through volume reductions compared to solid structural timber

The design of GLT® can take place on a higher safety level, as its loadbearing capacity is guaranteed by the patented tensile test procedure.

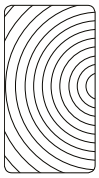
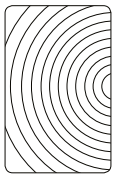
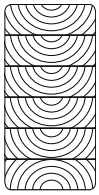
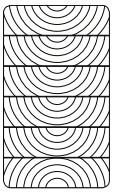
Example:

Solid structural timber	120/240 mm	100%
GLT®24	100/240 mm	105%
Cost advantage		**12%**

Due to the pronounced increase of the performance of GLT®, up to 12% of costs (up to EUR 30 per m³) can be saved if compared to solid structural timber.

Example of cost savings

Rafter-supporting purlin on a hall roof (in total 500 lm are required)
Span = 5.0 m (single span beam)
Clearance e = 1.0 m
Service class 1
Persistent load g_k = 0.5 kN/m²
Snow load s_k = 2.0 kN/m

Building material	GLT®24	Solid structural timber C24	Glued laminated timber GL24H	Glued laminated timber GL24C
Cross section	 120/220	 140/220	 120/240	 140/240
Price per linear metre	EUR 10.30	EUR 11.46	EUR 14.17	EUR 16.13
Costs in EUR/500 lm	EUR 5,150.00	EUR 5,730.00	EUR 7,085.00	EUR 8,065.00
Ratio in %	–27%	–19%	±0%	+14%

04

GLT® – Girder Longitudinally Tensiletested

Triple security

Which is completely tested, is the safest! Each individual GLT® – girder longitudinally tensiletested as well as its finger joint connections are tested under extreme conditions.

Safety step 1:
Quality grading

Specifically selected and certified sawn timber is produced in our sawmill, where it is technically dried and carefully pre-graded by our specialists.

Safety step 2:
High-Tech strength grading

Using state-of-the-art X-ray and laser technology, strength-relevant wood defects are detected and eliminated without any compromise.

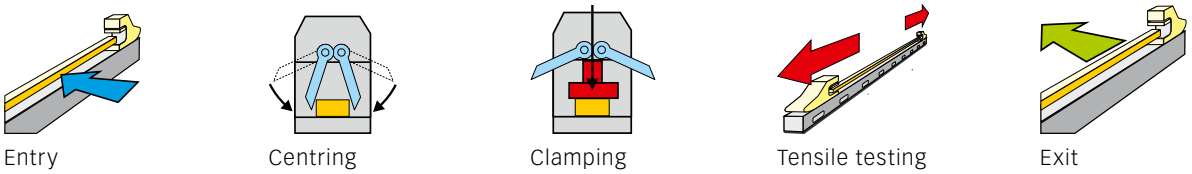
Saftey step 3:
Patented tensile test

In common, the strength of loadbearing components is only monitored on a random basis – not in case of GLT®. Here, each individual GLT®, without exception, is subjected to the patented tensile test procedure according to ON B 4125, thus ensuring a complete level of quality.

Advantages

- Safety in the finger joints' loadbearing behaviour
- Safety in the grading process
- The same design as glued laminated timber
- Up to 20% of material savings if compared to conventional solid construction timber
- Up to 15% in cost savings if compared to glued laminated timber

Tensile test procedure according to ON B 4125



Entry | Centring | Clamping | Tensile testing | Exit

05
Technical data

Bonding
Polyurethane adhesive type I according to EN 301, approved for bonding loadbearing and non-loadbearing timber components, both indoors and outdoors

Moisture content
15% ±3%

Density
In dependence of the strength class, approximately 450 kg/m³ to 500 kg/m³ in average

Thermal conductivity
λ = 0.13 W/mK

Diffusion resistance
According to EN ISO 10456
μ = 50 (dry) to 20 (wet)

Formaldehyde emissions
E1 according to EN 717-1 (<0.1 ppm)
Polyurethane adhesive is free of formaldehyde.

Tensile stresses due to testing
60% of the characteristic tensile strength
GLT®24 8.4 N/mm²

Fire behaviour
D-s2, d0
D_{fl}-s1, when used as floor covering

Structural fire resistance
0.80 mm/min in accordance to EN 1995-1-2

Shrinkage and swelling behaviour
Perpendicular to the grain direction
$\alpha_{u,90}$ = 0.24% per 1% change in moisture content

Parallel to the grain direction
$\alpha_{u,0}$ = 0.01% per 1% change in moisture content

Dimensional tolerances
Cross section: in accordance to EN 15497
Twist/warping: in accordance to DIN 4074-1
Length: in accordance to EN 14080

Service classes (EN 1995-1-1)
Service class 1 heated interior
Service class 2 roofed outdoor area

06
Product range

Package units

Height in mm	t	m³	t	m³	t	m³	t	m³	t	m³
	unit	cm	unit	cm	unit	cm	unit	cm	unit	cm
280	2.4	5.24	2.6	5.82	2.6	5.82	2.4	5.24		
	24	112 x 36	**20**	112 x 40	**16**	112 x 40	**12**	112 x 36		
260	2.2	4.87	2.4	5.41	2.4	5.41				
	24	104 x 36	**20**	104 x 40	**16**	104 x 40				
240	2.0	4.49	2.2	4.99	2.2	4.99	2.0	4.49	2.4	5.24
	24	96 x 36	**20**	96 x 40	**16**	96 x 40	**12**	96 x 36	**12**	96 x 42
220	2.3	5.15	2.6	5.72	2.6	5.72	2.3	5.15	2.7	6.01
	30	110 x 36	**25**	110 x 40	**20**	110 x 40	**15**	110 x 36	**15**	110 x 42
200	2.1	4.68	2.3	5.20	2.3	5.20	2.1	4.68	2.5	5.46
	30	100 x 36	**25**	100 x 40	**20**	40 x 40	**15**	100 x 36	**15**	100 x 42
180	2.3	5.05	2.5	5.62	2.5	5.62	2.3	5.05	2.7	5.90
	36	108 x 36	**30**	108 x 40	**24**	108 x 40	**18**	108 x 36	**18**	108 x 42
160	2.4	5.24	2.6	5.82	2.6	5.82	2.4	5.24	2.8	6.12
	42	112 x 36	**35**	112 x 40	**28**	112 x 40	**21**	112 x 36	**21**	112 x 42
140	2.4	5.24	2.6	5.82	2.6	5.82	2.4	5.24	2.8	6.12
	48	112 x 36	**40**	112 x 40	**32**	112 x 40	**24**	108 x 36	**24**	112 x 42
120	2.3	5.05	2.5	5.62	2.5	5.62	2.3	5.05		
	54	108 x 36	**45**	108 x 40	**36**	108 x 40	**27**	108 x 36		
Width in mm	60		80		100		120		140	

Information on further cross sections is available on request .

07

Quality description

Parameters	Visual Quality	Industrial Quality
Description	For loadbearing and non-loadbearing components in visual form, such as visible rafters, visible beams, etc.	For loadbearing and non-loadbearing components in non-visual form, e.g. as lightweight timber construction, covered rafters and purlins, etc.
Wood species	Spruce	Spruce (fir is also permitted) or pine
Mistletoe infestation	Not permitted	Not permitted
Moisture content	Maximum of 18%	Maximum of 18%
Cut type	Separated at the core	Separated at the core
Bark embedding	Nor permitted	To be treated as knots
Pitch pockets	Up to 5 mm wide, no clusters	Permitted
Surface	Cleanly planed and chamfered on all sides	Planed and chamfered on all sides, rough areas are permitted
Dimensional accuracy	Dimensional accuracy of the cross section according to EN 15497, of the length according to EN 390. In case of visual and standard quality, undersize of up to 2 mm is possible.	
Finishes	Trimmed square, dimensional accuracy of length according to EN 390	
Wane	Not permitted	Up to 10% of the cross section's side
Knots[(1)]	Up to 40% of the cross section's side[(2)]	Up to 40% of the cross section's side
Average annual ring width[(3)]	Up to 6 mm	Up to 6 mm
Grain slope	Up to 12 cm/m	Up to 12 cm/m
Shrinkage cracks	Crack width of up to 3 mm	Permissible crack depth of up to 50%
Edge cracks	Not permitted	Permitted
Lightning/frost cracks, ring shake	Not permitted	Not permitted
Blue stains	Not permitted	Permitted
Nailing stripes (red, brown)	Not permitted	Permitted
Red and white rots	Not permitted	Not permitted
Compression wood/ glassy wood/redwood	Up to 40% of the surface	Up to 40% of the surface
Insect attack	Not permitted	Permissible up to a diameter of 2 mm
Scope of validity	The specified surface qualities are valid at time of delivery.	

(1) A knot diameter of up to 40% of the cross section's height or width is permitted.
(2) Loose knots, falling-out knots, knocked-out and isolated knots with black rimmed knots are permitted up to 20 mm of the knot diameter
(3) The average annual ring width according to EN 1310 is applicable. Thereby, an area of 25 mm around the pith is not taken into account. For reasons of inevitable grading errors and variability of moisture content within the cross sections, the requirements and grading criteria specified in the table must be complied in 95% of the supplied pieces. In case of mechanical grading, related parameters are according to EN 14081. Therefore, deviations from the ones shown in the table may occur.

08
Mechanical properties

Strength and stiffness properties according to ETA-13/0644

Strength class			GLT®24
Bending strength	$f_{m,k}$ [1)]	N/mm²	24 x k_{pl}
Tensile strength	$f_{t,0,k}$	N/mm²	14 x k_{pl}
	$f_{t,90,k}$	N/mm²	0,4
Compressive strength	$f_{c,0,k}$ [1)]	N/mm²	21 x k_{pl}
	$f_{c,90,k}$	N/mm²	2,5
Shear strength	$f_{v,k}$ [2)]	N/mm²	4,0
Modulus of elasticity	$E_{0,mean}$	N/mm²	11,600
	$E_{0,05}$	N/mm²	7,400
	$E_{90,mean}$	N/mm²	370
Shear modulus	G_{mean}	N/mm²	690
Rolling shear modulus	ρ_k	kg/m³	350
	ρ_{mean}	kg/m³	420

1) For GLT® beams the values for bending strength, tensile strength and compressive strength can be multiplied by the factor kpl according to ETA-13/0644.
2) The shear strength must be multiplied by the factor kcr (crack factor).

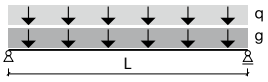
Dimensions according to technical assessment

Design values for tension, compression and bending are determined by
k_{pl} = 1.05 ... proof-loading coefficient

$$f_d = \frac{f_k \cdot k_{mod}}{\gamma_m} \cdot k_{pl}$$

09
Tables for preliminary design

Girder Longitudinally Tensiletested GLT®24, single span beams



Maximum span length in m for a single span beam																		
Height in mm	Width in mm	Persistent loads q incl. imposed load p in kN/m																
		1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	15	20	25
240	140	7.36	6.55	6.01	5.62	5.31	5.06	4.85	4.67	4.52	4.26	4.05	3.80	3.59	3.40	2.65	2.00	1.60
200		6.19	5.50	5.04	4.70	4.44	4.23	4.05	3.90	3.77	3.56	3.38	3.17	2.99	2.84	2.22	1.67	1.34
140		4.40	3.89	3.55	3.31	3.12	2.97	2.85	2.74	2.65	2.50	2.37	2.23	2.10	1.99	1.56	1.17	0.94
240	120	7.05	6.26	5.74	5.36	5.06	4.82	4.62	4.45	4.30	4.05	3.76	3.52	3.32	3.16	2.28	1.71	1.37
200		5.92	5.25	4.80	4.48	4.23	4.02	3.86	3.71	3.59	3.38	3.14	2.94	2.77	2.63	1.90	1.43	1.15
160		4.78	4.22	3.86	3.60	3.39	3.23	3.09	2.98	2.88	2.71	2.52	2.36	2.22	2.11	1.52	1.15	0.92
120		3.61	3.19	2.91	2.71	2.55	2.43	2.32	2.24	2.16	2.04	1.89	1.77	1.67	1.59	1.15	0.86	0.69
280	100	7.75	6.88	6.30	5.88	5.56	5.29	5.07	4.88	4.72	4.32	4.01	3.75	3.54	3.30	2.22	1.67	1.34
240		6.69	5.93	5.42	5.06	4.77	4.54	4.35	4.19	4.05	3.71	3.44	3.22	3.04	2.84	1.90	1.43	1.15
200		5.61	4.96	4.54	4.23	3.99	3.80	3.64	3.50	3.38	3.10	2.87	2.69	2.54	2.37	1.59	1.19	0.96
160		4.52	3.99	3.64	3.39	3.20	3.04	2.91	2.80	2.71	2.48	2.30	2.15	2.03	1.90	1.27	0.96	0.77
140		3.97	3.50	3.19	2.97	2.80	2.67	2.55	2.46	2.37	2.17	2.01	1.89	1.78	1.67	1.11	0.84	0.67
120		3.42	3.01	2.74	2.55	2.41	2.29	2.19	2.11	2.04	1.87	1.73	1.62	1.53	1.43	0.96	0.72	0.57
280	80	7.26	6.43	5.88	5.48	5.18	4.93	4.72	4.46	4.23	3.87	3.59	3.30	2.94	2.65	1.78	1.34	1.07
240		6.26	5.53	5.06	4.71	4.45	4.23	4.05	3.83	3.63	3.32	3.08	2.84	2.53	2.28	1.52	1.15	0.92
200		5.25	4.63	4.23	3.94	3.71	3.53	3.38	3.20	3.03	2.77	2.57	2.37	2.11	1.90	1.27	0.96	0.77
160		4.22	3.72	3.39	3.16	2.98	2.83	2.71	2.56	2.43	2.22	2.06	1.90	1.69	1.52	1.02	0.77	0.61
140		3.71	3.26	2.97	2.77	2.61	2.48	2.37	2.24	2.13	1.95	1.80	1.67	1.48	1.34	0.89	0.67	0.54
120		3.19	2.80	2.55	2.37	2.24	2.13	2.04	1.93	1.83	1.67	1.55	1.43	1.27	1.15	0.77	0.57	0.46
280	60	6.67	5.88	5.37	5.00	4.72	4.38	4.10	3.87	3.68	3.30	2.84	2.49	2.22	2.00	1.34	1.00	0.80
240		5.74	5.06	4.62	4.30	4.05	3.76	3.52	3.32	3.16	2.84	2.44	2.14	1.90	1.71	1.15	0.86	0.69
200		4.80	4.23	3.86	3.59	3.38	3.14	2.94	2.77	2.63	2.37	2.04	1.78	1.59	1.43	0.96	0.72	0.57
160		3.86	3.39	3.09	2.88	2.71	2.52	2.36	2.22	2.11	1.90	1.63	1.43	1.27	1.15	0.77	0.57	0.46
140		3.39	2.97	2.71	2.52	2.37	2.20	2.06	1.95	1.85	1.67	1.43	1.25	1.11	1.00	0.67	0.50	0.40
120		2.91	2.55	2.32	2.16	2.04	1.89	1.77	1.67	1.59	1.43	1.23	1.07	0.96	0.86	0.57	0.43	0.35

The table only represents a feature for preliminary design and therefore does not replace the necessary static proof.

Calculation example:

Persistent load	g = 1.80 kN/m²
Variable load	p = 1.70 kN/m²
Total load	q = g + p = 3.4 kN/m
Tabular value	3.5 kN/m
Beam's span length	4.50 m
Possible cross sections	100/240 mm, 80/280 mm

10

HASSLACHER group product range

Sawn timber

Surfaced timber

Structural finger jointed solid timber & GLT®

Glued solid timber Duo/Trio

Glued laminated timber

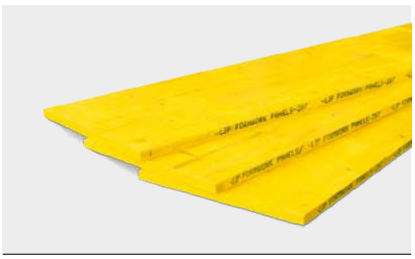
Gluedceilingsystems

Cross Laminated Timber

Glued laminated timber special components

Solid wood boards

Pellets



Formwork panels

Pallets & packaging solutions

HASSLACHER
NORICA TIMBER

From **wood** to **wonders.**

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