**HASSLACHER**
**NORICA TIMBER**
From **wood** to **wonders.**

# Glued ceiling systems

The high-performance ceiling system.

# 01
# At a glance

## Areas of application
- Single and multiple family houses
- Multi-storey residential buildings
- Industrial and commercial buildings
- Maintenance of old buildings
- Urban densification

## Field of use
- Floors
- False floors
- Attic floors
- Roof panels

## Advantages
- Quick and easy assembly
- Loads are applicable immediately after assembly
- Lower self-weight than reinforced concrete
- High dimensional stability through bonding and technical drying
- High fire and chemical resistance
- High performance in terms of thermal insulation
- Smallest construction height even under heavy loads
- Transparent glue line
- Pleasant and comfortable room climate

# 02
# Overview

## Product standard/certification

EN 14080

## Surface qualities

Visual quality
Industrial quality

## Cross sections

Heights:   60 to 280 mm in 20 mm steps
Widths:    400 mm to 1,280 mm (steps depend
           on the width of the used raw lamellas)
Lengths:   up to 27 m

## Post-processing

possible up to 1,280 mm

## Strength classes

GL24h, GL28h in accordance to EN 14080
(higher strength classes are available on request)

## Wood species

⊕  Spruce/fir
⊕  Other wood species on request

## 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/06-32-12
Promoting
Sustainable Forest
Management
www.pefc.org

# 03
# Technical data

## Bonding

Melamine resin adhesive with bright glue line, adhesive type I according to EN 301 approved for gluing loadbearing and non-loadbearing timber components, both indoors and outdoors

## Lamella thickness

Up to 45 mm according to EN 14080

## Moisture content

12 % ± 2 % or ÖNORM EN 14080

## Density

Depending on the strength class, approximately 450 kg/m³ to 500 kg/m³ in average

## Thermal conductivity

$\lambda$ = 0.13 W/mK

## Diffusion resistance

According to EN ISO 10456
$\mu$ = 50 (dry) to 20 (wet)

## Formaldehyde emissions

E1 according to EN 717-1 (<0.1 ppm)

## Fire behaviour

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

## Structural fire resistance

0.65 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

## Recommendation

Due to the swelling and shrinkage behaviour and the associated gap formation, the following element widths are recommended:
Visual quality:        400 mm to 600 mm
Industrial quality:    600 mm to 800 mm
In case of a low wood equilibrium moisture content, a corresponding gap formation between the individual elements has to be expected.

## Dimensional tolerances

According to EN 390 or to EN 14080

## Service classes (EN 1995-1-1)

Service class 1   heated interior
Service class 2   roofed outdoor area

# 04
# Quality description

| Characteristics | Visual Quality | Industrial Quality |
|---|---|---|
| **General** | Optimised for a visible use, e.g. as visible rafters and beams for carports and upscale residential areas. All knots are sound knots and knotholes are patched. The occurrence of discolouration such as blue stains, red stripes and/or pitch pockets is minimised. The cracks are minimised and hardly any heart centre is present due to core-free cutting. A homogeneous appearance is aspired. | Optimised for non-visual use, e.g. for industrial and production buildings, farming buildings and roof structures, which are subsequently covered by planks. Discolouration such as brownness (nail-holding), blue stain, and/or red stripes are permitted. Fallen-out knots and pitch pockets may casually occur. |
| **Black knots** | Permitted, as long as they don't fall out | Permitted |
| **Fallen-out knots** | Permitted up to approximately 20 mm, sound knots are permitted | Permitted, the size depends on the strength classes |
| **Wane** | Not permitted | Permitted |
| **Rotten areas** | Not permitted | Not permitted |
| **Pitch pockets** | Permitted up to approximately 5 x 50 mm, larger pockets must be patched | Permitted |
| **Insect infestation** | Not permitted | Permitted up to a diameter of 2 mm |
| **Discolouration** | Up to approximately 5 % of the surface | Permitted |
| **Planing quality** | Rough areas are not permitted. Planer marks up to a length of 10 mm and a depth of 1 mm are permitted | Rough areas and planer marks are permitted |
| **Cracks** | Permitted up to a depth of 1/6th of the component width (per side). The required static load carrying capacity must not be impaired. | Permitted up to a depth of 1/6th of the component width (per side). The required static load carrying capacity must not be impaired. |
| **Scope of validity** | The specified surface qualities are valid at time of delivery. | |
| **Information** | In case of a low wood equilibrium moisture content, a corresponding gap formation between the individual elements has to be expected. In case of a high wood equilibrium moisture content, the elements can swell perpendicular to the layers' fibre direction. | |

# 05
# Design and acoustic elements

## Areas of use
- Offices and public buildings
- Schools and kindergartens
- Gyms
- Auditoriums and rehearsal rooms

## Advantages
- Visually appealing interior architecture
- Enhancement of room acoustics
- Fast and easy assembly

## Surface qualities
Visual quality
Industrial quality

## Cross sections
Thicknesses:    80 mm to 280 mm in 20 mm steps
Widths:         200 to 1,200 mm in 40 mm steps
Lengths:        up to 27 m

## Strength classes
GL24h, GL28h in accordance to EN 14080
Higher strength classes are available on request

## Degree of openness
Approximately 20 % of the visible surface

## Sound absorption coefficient
$\alpha_w = 0.10$

# 06
# Joint formation
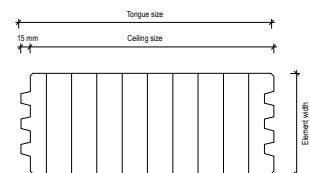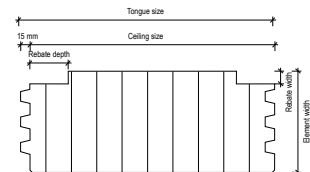
## Tongue and groove

### Element pattern
Element thickness: in 20 mm steps
Element width: in 40 mm steps
Net width = tongue size – 15 mm
Possible length up to 27 m

### Thickness
60, 80 mm
100, 120, 140 mm
160, 180 mm
200, 220, 240 mm
260, 280 mm

### Tongue and Groove
1 Tongue and groove
2 Tongue and groove
3 Tongue and groove
4 Tongue and groove
5 Tongue and groove

## Tongue and groove, including longitudinal rebate

### Element pattern
Element thickness: in 20 mm steps
Element width: in 40 mm steps
Net width = tongue size – 15 mm
Possible length up to 27 m

### Thickness
60, 80 mm
100, 120, 140 mm
160, 180 mm
200, 220, 240 mm

### Rebate
Depth: 60 mm, width: 20 mm

### Tongue and Groove
1 Tongue and groove
2 Tongue and groove
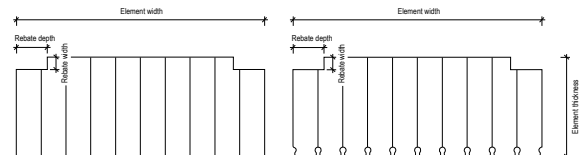3 Tongue and groove
4 Tongue and groove

## Longitudinal rebate

### Element pattern
Element thickness: in 20 mm steps
Element width: in 40 mm steps
Net width = finished size
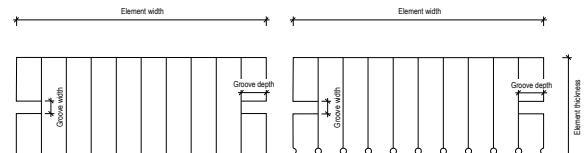Possible length up to 27 m

### Rebate
Depth: 50 mm
Width: 20 mm

## Single groove with loose tongue

### Element pattern
Element thickness: in 20 mm steps
Element width: in 40 mm steps
Net width = finished size
Possible length up to 27 m

### Groove
Depth: 40 mm
Width: 20 mm

## Longitudinal rebate with single groove and loose tongue
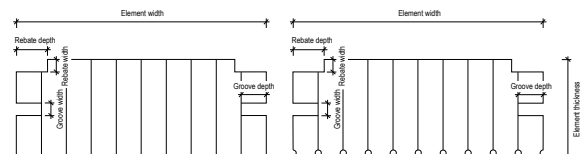
### Element pattern
Element thickness: in 20 mm steps
Element width: in 40 mm steps
Net width = finished size
Possible length up to 27 m

### Rebate
Depth: 50 mm
Width: 20 mm

### Groove
Depth: 40 mm
Width: 20 mm

# 07
# Mechanical properties

## Characteristic strength and stiffness property values

| Strength class | | | acc. to EN 14080 | |
|---|---|---|---|---|
| | | | GL24h | GL28h |
| Bending strength | $f_{m,k}$ [1] | N/mm² | 24 | 28 |
| Tensile strength | $f_{t,0,k}$ | N/mm² | 19.2 | 22.3 |
| | $f_{t,90,k}$ | N/mm² | 0.5 | 0.5 |
| Compressive strength | $f_{c,0,k}$ [1] | N/mm² | 24 | 28 |
| | $f_{c,90,k}$ | N/mm² | 2.5 | 2.5 |
| Shear strength | $f_{v,k}$ | N/mm² | 3.5 | 3.5 |
| Modulus of elasticity | $E_{0,mean}$ | N/mm² | 11,500 | 12,600 |
| | $E_{0,05}$ | N/mm² | 9,600 | 10,400 |
| | $E_{90,mean}$ | N/mm² | 300 | 300 |
| | $E_{90,05}$ | N/mm² | 250 | 250 |
| Shear modulus | $G_{mean}$ | N/mm² | 650 | 650 |
| Rolling shear modulus | $\rho_{k}$ | kg/m³ | 385 | 425 |
| | $\rho_{mean}$ | kg/m³ | 420 | 460 |

1) According to EN 1995-1-1 or DIN 1052, the values for bending strength and compressive strength parallel to grain direction can be multiplied by the system coefficient.

# Tables for preliminary design

## Floors without the verification of vibrations floor class 3

### Single span beam
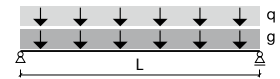


| g + q = p | Span length L | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3.00 m | 3.50 m | 4.00 m | 4.50 m | 5.00 m | 5.50 m | 6.00 m | 6.50 m | 7.00 m | 7.50 m |
| 2.0 kN/m² | 80 mm | 80 mm | 100 mm | 100 mm | 120 mm | 140 mm | 140 mm | 160 mm | 180 mm | 180 mm |
| 3.0 kN/m² | 80 mm | 100 mm | 100 mm | 120 mm | 140 mm | 140 mm | 160 mm | 180 mm | 180 mm | 200 mm |
| 4.0 kN/m² | 80 mm | 100 mm | 120 mm | 140 mm | 140 mm | 160 mm | 180 mm | 180 mm | 200 mm | 220 mm |
| 5.0 kN/m² | 100 mm | 100 mm | 120 mm | 140 mm | 160 mm | 160 mm | 180 mm | 200 mm | 220 mm | 220 mm |
| 6.0 kN/m² | 100 mm | 120 mm | 140 mm | 140 mm | 160 mm | 180 mm | 200 mm | 200 mm | 220 mm | 240 mm |
| 7.0 kN/m² | 100 mm | 120 mm | 140 mm | 160 mm | 160 mm | 180 mm | 200 mm | 220 mm | 240 mm | on request |
| 8.0 kN/m² | 100 mm | 120 mm | 140 mm | 160 mm | 180 mm | 200 mm | 200 mm | 220 mm | 240 mm | on request |

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

### Two-span beam
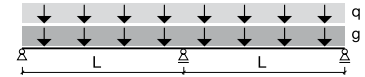


| g + q = p | Span length L | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3.00 m | 3.50 m | 4.00 m | 4.50 m | 5.00 m | 5.50 m | 6.00 m | 6.50 m | 7.00 m | 7.50 m |
| 2.0 kN/m² | 80 mm | 80 mm | 80 mm | 80 mm | 100 mm | 100 mm | 100 mm | 120 mm | 120 mm | 140 mm |
| 3.0 kN/m² | 80 mm | 80 mm | 80 mm | 100 mm | 100 mm | 100 mm | 120 mm | 120 mm | 140 mm | 140 mm |
| 4.0 kN/m² | 80 mm | 80 mm | 80 mm | 100 mm | 100 mm | 120 mm | 120 mm | 140 mm | 160 mm | 160 mm |
| 5.0 kN/m² | 80 mm | 80 mm | 100 mm | 100 mm | 120 mm | 120 mm | 140 mm | 140 mm | 160 mm | 180 mm |
| 6.0 kN/m² | 80 mm | 80 mm | 100 mm | 120 mm | 120 mm | 140 mm | 140 mm | 160 mm | 160 mm | 180 mm |
| 7.0 kN/m² | 80 mm | 100 mm | 100 mm | 120 mm | 120 mm | 140 mm | 160 mm | 160 mm | 180 mm | 180 mm |
| 8.0 kN/m² | 80 mm | 100 mm | 100 mm | 120 mm | 140 mm | 140 mm | 160 mm | 180 mm | 180 mm | 200 mm |

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

### Boundary conditions

- ⊕ Service class 1 in accordance to EN 1995-1-1
- ⊕ Persistent load g without the element's self-weight, as it has already been taken into account.
- ⊕ The share of imposed loads q is in total at least 50 %.
- ⊕ As part of this preliminary design, oscillations are not taken into account.
- ⊕ The load is uniformly distributed, individual/concentrated loads are not taken into account.
- ⊕ Field loads are not taken into account.
- ⊕ For an estimation of the impact of vibrations, the loads can be increased by approximately 35 %.

### Example calculation

| | |
|---|---|
| Imposed load | 2.00 kN/m² |
| Light wall allowance | 0.50 kN/m² |
| Floor covering | 0.10 kN/m² |
| Floor structure, e.g. screed | 1.20 kN/m² |
| Self-weight | is included in the calculation |
| Total load p = | 3.80 kN/m² |

Single-span beam, span length 5 m => element thickness 140 mm

# 09
# HASSLACHER group product range

Sawn timber

Surfaced timber

Structural finger jointed solid timber & GLT®

Glued solid timber Duo/Trio

Glued laminated timber

Glued ceiling systems

Cross laminated timber

Glued laminated timber special components

Solid wood boards

Pellets

Formwork panels

Pallets & packaging solutions