WHERE
IDEAS
CAN
GROW.

MAYR MELNHOF HOLZ

# MM vistaline

duo and trio beams

# WHERE IDEAS CAN GROW.

Mayr-Melnhof Holz Holding AG is one of the most prominent companies in the European wood-processing industry. As the market leader in the glued laminated timber (glulam) sector, it is a driving force behind the advancement of cross-laminated timber, the building material of the future. It is only companies with strong roots that are able to grow and surpass themselves, and indeed, Mayr-Melnhof Holz's roots go back as far as 1850. The corporate group draws on over 170 years of experience in processing the raw material, wood, which it sources exclusively from sustainably managed forests. For Mayr-Melnhof Holz, secure sources of supply, consistent traceability of the raw material's origin, transparent quality assurance of products and ongoing optimization of processes lay the foundations for reliability and product quality.

## Mayr-Melnhof Holz products

**MM masterline**
Glued laminated timber (glulam)

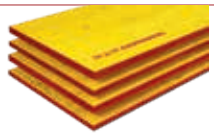
**MM vistaline**
Duo and trio beams

**MM profideck**
Glulam floor panels

**MM blockdeck**
Glulam boards

**MM HBE**
Solid wood building elements

**MM crosslam**
Cross-laminated timber (CLT)



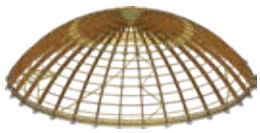
**K1 yellowplan**
Shuttering panels

**HT 20plus**
Formwork beams

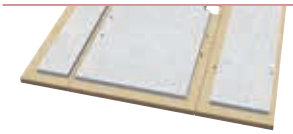
**MM sawn timber**

**MM royalpellets**

## Engineered glulam and engineering services



**MM complete**
Timber engineering
and complete systems
By HUTTEMANN



Wood-concrete composite elements
By MK

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# MM vistaline

duo and trio beams

## Unique quality for visible timber structures

**MM vista**line are rectangular, glued lamella beams which are predominantly used as visible structures in residential and commercial buildings. These solid wood beams, produced by Mayr-Melnhof Holz, consist of two or more softwood lamellas which are glued together vertically. Original sawing techniques, rigorous selection of raw materials and careful drying of the spruce wood are what give the finished product its unrivalled visual quality. **MM vista**line products are subjected to strict quality controls before being PEFC-certified.

## Advantages

- High structural strength with low self-weight compared to bulk density
- Excellent strength of shape and dimensional stability
- Watertight bonding with a light-coloured joint based on melamine resin adhesive
- No visible joints on the vertical sides
- Strength-graded lamellas made from FOHC timber
- Precise sizing for individual project requirements

## Areas of application

- Ceiling joists
- Roof structures
- Mullion-transom structures
- Building methods using timber frames and prefabricated elements

CE

Certified according to the Construction Products Regulation (CPR)
EN 14080:2013

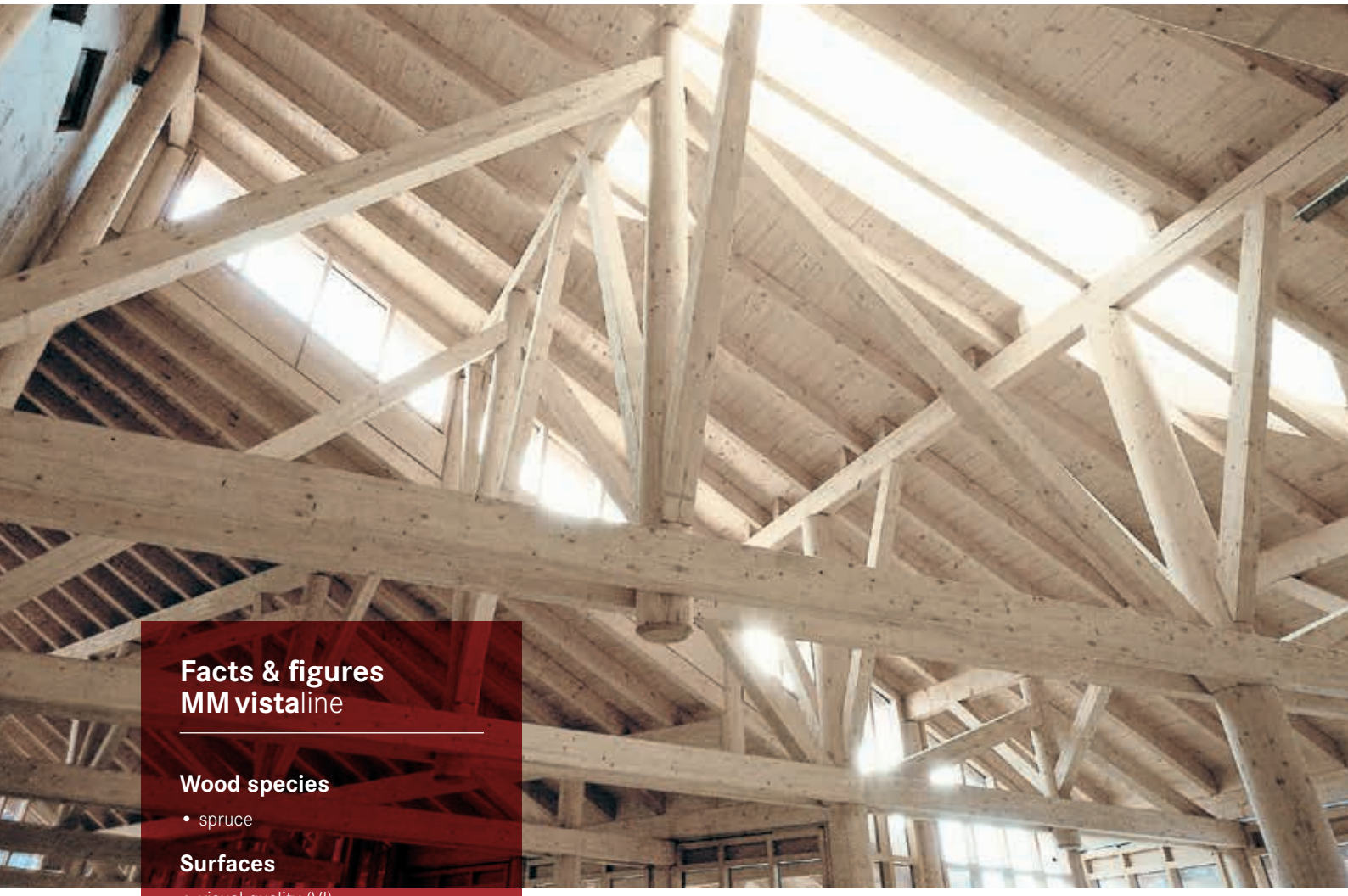
PEFC

PEFC/06-38-79

Promoting Sustainable Forest Management

www.pefc.org

Seal of approval for healthy living environments
(IBR Rosenheim)



## Facts & figures MM vistaline

### Wood species
- spruce

### Surfaces
- visual quality (VI)

### Dimensions
- width: 8 cm to 24 cm
- height: 10 cm to 24 cm
- length: 12.00 m to 13.50 m

### Product standard
- EN 14080:2013

### Strength class
- C24

## Dimensional stability, dry and minimum cracks

Duo and trio beams for demanding designs.

Depending on the application, the exposed beams from the **MM vista**line range consist of two, three or four lamellas glued together. The beams are available in 33 different cross-sections.

The strength of the spruce lamellas used is standardized and the visual quality is carefully selected. **MM vista**line components are highly regarded by architects and building contractors as dimensionally stable, crack-resistant lamella beams without visible joints on the vertical sides. It is these properties that make these high-quality products so popular for use in living areas, restaurants, exhibition halls or hotel complexes. Duo and trio beams in non-visual quality are also used in high-quality timber frame and prefabricated building methods, as, unlike traditional structural timber, they are not subject to twisting.

# Technical data

## Product

Lamella beams consisting of two or three board lamellas bonded together with the grain running parallel.

## Wood species

Spruce (*Picea abies*).

## Grading of timber

Grading according to EN 14081 and DIN 4074-1.

## Product standard

EN 14080:2013

## Lamella thickness

**MM vista**line is produced with a lamella thickness of 50, 60, 70 or 80 mm for service classes 1 and 2 (i.e. indoor areas and sheltered outdoor areas).

## Strength class C24

| | | | |
|---|---|---|---|
| **Bending strength** | $f_{m,k}$ | [N/mm²] | 24 |
| **Tensile strength** | $f_{t,0,k}$ | [N/mm²] | 14.50 |
| | $f_{t,90,k}$ | [N/mm²] | 0.40 |
| **Compressive strength** | $f_{c,0,k}$ | [N/mm²] | 21 |
| | $f_{c,90,k}$ | [N/mm²] | 2.50 |
| **Shear strength** | $f_{v,k}$ | [N/mm²] | 4 |
| **Modulus of elasticity** | $E_{0,mean}$ | [N/mm²] | 11,000 |
| | $E_{0,k}$ | [N/mm²] | 7,400 |
| | $E_{90,mean}$ | [N/mm²] | 370 |
| **Shear modulus** | $G_{mean}$ | [N/mm²] | 690 |
| **Rolling shear modulus** | $\rho_k$ | [kg/m³] | 350 |
| | $\rho_{mean}$ | [kg/m³] | 420 |

## Bonding

Adhesive based on melamine resin (MUF), type 1 according to EN 301, approved for bonding load-bearing wood components in indoor and outdoor areas.

Adhesive for finger joints: MUF (EN 301-I-90-FJ-0,3-S).
Adhesive for surface bonding: MUF (EN 301-I-90-GP-0.3-S).

## Planing

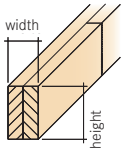
Four smoothly-planed sides.

## Edges

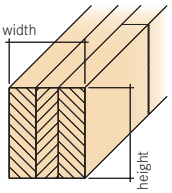
Four sides with a gentle chamfer.

## Definition of dimensions

**MM vista**line duo




**MM vista**line trio




Lengths: 12.00 m and 13.50 m (can also be made to order on request).

## Wood moisture content

12% (±2%)

## Bulk density (mean value)

Spruce ..... approx. 430 kg/m³

## Thermal conductivity

$\lambda$ = 0.13 W/(mK)

## Water vapour resistance factor

$\mu$ = 20 to 40 (with a 12% moisture content)

## Reaction to fire

- Building material class B2 (normally inflammable) according to DIN 4102-4 and Euroclass D, s2, d0 according to EN 13501.
- Calculated charring rate: 0.7 mm/min

## Emission class

This product is well within the limit values of emission class E1 (≤ 0.1 ppm HCHO).

## Surface quality

**Visual quality (VI):** timber sawn free of heart centre (FOHC), absence of abnormal discolouration, sound-knotted (any errors are corrected).

**Non-visual quality (NVI; on request only):** loose knots, blue stain and red stripe colour deviations permitted.

## Shrinkage and swelling

In width and height, **MM vista**line elements are subject to an average swelling and shrinkage ratio of 0.24% per 1% change in wood moisture content. In most cases, changes in length corresponding to 0.01% can be ignored.

In closed, normally ventilated rooms, a wood moisture content of 9% is to be expected. This corresponds to an equilibrium moisture content at a room temperature of 20 °C and a relative humidity of 50%.

As a result of the shrinkage and swelling behaviour of wood, which is natural and therefore unavoidable, small shrinkage cracks can occur depending on the indoor climate.

## Dimensional tolerances

Maximum permitted deviations from the nominal dimensions for glued laminated timber according to EN 14080:2013.

| | | |
|---|---|---|
| Widths and heights: | ±1.0 mm | b, h ≤ 10 cm |
| | ±1.5 mm | b, h > 10 cm |
| Length: | ±3.0 mm | l ≤ 10 m |
| | ±5.0 mm | l > 10 m |

Maximum deviation of the cross-section angle from the right angle: 1 to 50 (1:50).

## Marking

**MM vista**line lamella beams are identified as glued laminated timber and bear the CE marking in accordance with EN 14080:2013, attesting to their compliance with the Construction Products Regulation (CPR).

CE

## Packaging

Delivered in film-wrapped packages (see list of packed units). Individually wrapped on request.

- The film protects the components from dirt and splash water during transport.
- The film only provides limited protection of the component against UV radiation and water absorption.
- The packing is not suitable for storing over long periods of time.

Temporary water infiltration is not in itself a defect. If damp or water infiltrates the package, cut and remove the plastic film to ensure good air circulation around the damp components concerned.

# Product portfolio

| Width | Height | Length | Items per package | Items per layer | Number of layers | Package width | Package height |
|---|---|---|---|---|---|---|---|
| [mm] | [mm] | [m] | | | | [mm] | [mm] |
| **MM vistaline duo consisting of two lamellas** | | | | | | | |
| 80 | 100 | 12.00 and 13.50 | 48 | 12 | 4 | 1,200 | 320 |
| 80 | 120 | 12.00 and 13.50 | 40 | 10 | 4 | 1,200 | 320 |
| 80 | 140 | 12.00 and 13.50 | 32 | 8 | 4 | 1,120 | 320 |
| 80 | 160 | 12.00 and 13.50 | 28 | 7 | 4 | 1,120 | 320 |
| 80 | 180 | 12.00 and 13.50 | 24 | 6 | 4 | 1,080 | 320 |
| 80 | 200 | 12.00 and 13.50 | 24 | 6 | 4 | 1,200 | 320 |
| 100 | 140 | 12.00 and 13.50 | 32 | 8 | 4 | 1,120 | 400 |
| 100 | 160 | 12.00 and 13.50 | 28 | 7 | 4 | 1,120 | 400 |
| 100 | 180 | 12.00 and 13.50 | 24 | 6 | 4 | 1,080 | 400 |
| 100 | 200 | 12.00 and 13.50 | 24 | 6 | 4 | 1,200 | 400 |
| 100 | 240 | 12.00 and 13.50 | 20 | 5 | 4 | 1,200 | 400 |
| 120 | 120 | 12.00 and 13.50 | 20 | 10 | 2 | 1,200 | 240 |
| 120 | 160 | 12.00 and 13.50 | 14 | 7 | 2 | 1,120 | 240 |
| 120 | 180 | 12.00 and 13.50 | 12 | 6 | 2 | 1,080 | 240 |
| 120 | 200 | 12.00 and 13.50 | 12 | 6 | 2 | 1,200 | 240 |
| 120 | 220 | 12.00 and 13.50 | 10 | 5 | 2 | 1,100 | 240 |
| 120 | 240 | 12.00 and 13.50 | 10 | 5 | 2 | 1,200 | 240 |
| 140 | 140 | 12.00 and 13.50 | 16 | 8 | 2 | 1,120 | 280 |
| 140 | 200 | 12.00 and 13.50 | 12 | 6 | 2 | 1,200 | 280 |
| 140 | 240 | 12.00 and 13.50 | 10 | 5 | 2 | 1,200 | 280 |
| 160 | 160 | 12.00 and 13.50 | 14 | 7 | 2 | 1,120 | 320 |
| 160 | 200 | 12.00 and 13.50 | 12 | 6 | 2 | 1,200 | 320 |
| 160 | 240 | 12.00 and 13.50 | 10 | 5 | 2 | 1,200 | 320 |
| **MM vistaline trio consisting of three lamellas** | | | | | | | |
| 180 | 180 | 12.00 and 13.50 | 12 | 6 | 2 | 1,080 | 360 |
| 180 | 200 | 12.00 and 13.50 | 12 | 6 | 2 | 1,200 | 360 |
| 180 | 220 | 12.00 and 13.50 | 10 | 5 | 2 | 1,100 | 360 |
| 180 | 240 | 12.00 and 13.50 | 10 | 5 | 2 | 1,200 | 360 |
| 200 | 200 | 12.00 and 13.50 | 12 | 6 | 2 | 1,200 | 400 |
| 200 | 240 | 12.00 and 13.50 | 10 | 5 | 2 | 1,200 | 400 |
| 240 | 240 | 12.00 and 13.50 | 5 | 5 | 1 | 1,200 | 240 |

Delivered in film-wrapped packages.

# Spans

## Design table for single-span beam

These tables are provided for reference purposes only when carrying out the preliminary design. Prior to implementation, an accurate structural verification must be carried out in accordance with the currently valid design standards.

### Assumptions re system

- Uniform loading.
- The beam is held in place to prevent it from moving laterally; prevents the risk of tipping over.
- Shear and creep deformations are not taken into account.
- The uniform loading q is composed of:
  g ... constant load (incl. the beam dead load);
  p ... imposed load or snow load.

### Assumptions re material

| | | |
|---|---|---|
| Modulus of elasticity: | E = 11,000 | [N/mm²] |
| Permissible bending stress: | $\rho_{b,zul}$ = 10 | [N/mm²] |
| Permissible shear stress: | $\pi_{zul}$ = 0.90 | [N/mm²] |
| Permissible deformation: | $F_{zul}$ = l/300 | [m] |

## Example

### Where:

| | |
|---|---|
| Span: | L = 3.50 m |
| Load: | Q = 6.00 kN/m |

### Chosen sections:

- Cross-section of 120/220 mm:
  max. length (l) = 3.59 m > reference length (l) = 3.50 m
- Cross-section of 140/200 mm:
  max. length (l) = 3.53 m > reference length (l) = 3.50 m

### Decisive calculation criterion

| | W* | H* | Permanent loads [g] incl. imposed load [q] — unit: kN/m | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [mm] | | 1.00 | 1.50 | 2.00 | 2.50 | 3.00 | 3.50 | 4.00 | 4.50 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.00 | 15.00 |
| Duo | 80 | 100 | 2.63 | 2.30 | 2.05 | 1.90 | 1.80 | 1.70 | 1.60 | 1.55 | 1.45 | 1.35 | 1.25 | 1.15 | 1.05 | 0.95 | 0.65 |
| | 80 | 120 | 3.14 | 2.75 | 2.50 | 2.30 | 2.15 | 2.05 | 1.95 | 1.85 | 1.75 | 1.60 | 1.45 | 1.35 | 1.30 | 1.15 | 0.75 |
| | 80 | 140 | 3.65 | 3.20 | 2.90 | 2.70 | 2.50 | 2.35 | 2.20 | 2.10 | 2.00 | 1.80 | 1.70 | 1.60 | 1.50 | 1.35 | 0.90 |
| | 80 | 160 | 4.16 | 3.65 | 3.30 | 3.05 | 2.85 | 2.70 | 2.50 | 2.35 | 2.25 | 2.05 | 1.90 | 1.80 | 1.70 | 1.55 | 1.05 |
| | 80 | 180 | 4.67 | 4.10 | 3.70 | 3.45 | 3.25 | 3.05 | 2.85 | 2.65 | 2.50 | 2.30 | 2.15 | 1.95 | 1.90 | 1.75 | 1.15 |
| | 80 | 200 | 5.18 | 4.55 | 4.15 | 3.80 | 3.60 | 3.40 | 3.15 | 3.00 | 2.80 | 2.60 | 2.40 | 2.20 | 2.10 | 1.95 | 1.30 |
| | 100 | 140 | 3.92 | 3.40 | 3.10 | 2.90 | 2.70 | 2.60 | 2.50 | 2.35 | 2.25 | 2.05 | 1.90 | 1.75 | 1.65 | 1.55 | 1.15 |
| | 100 | 160 | 4.45 | 3.90 | 3.55 | 3.30 | 3.10 | 2.95 | 2.80 | 2.65 | 2.50 | 2.30 | 2.15 | 2.00 | 1.90 | 1.80 | 1.30 |
| | 100 | 180 | 5.00 | 4.40 | 4.00 | 3.70 | 3.50 | 3.35 | 3.15 | 2.95 | 2.80 | 2.60 | 2.40 | 2.25 | 2.10 | 2.00 | 1.45 |
| | 100 | 200 | 5.55 | 4.90 | 4.45 | 4.10 | 3.85 | 3.65 | 3.50 | 3.30 | 3.15 | 2.90 | 2.65 | 2.50 | 2.35 | 2.25 | 1.60 |
| | 100 | 240 | 6.60 | 5.80 | 5.30 | 4.95 | 4.65 | 4.40 | 4.20 | 3.95 | 3.75 | 3.45 | 3.20 | 3.00 | 2.85 | 2.70 | 1.90 |
| | 120 | 120 | 3.55 | 3.10 | 2.85 | 2.60 | 2.45 | 2.35 | 2.25 | 2.15 | 2.10 | 1.95 | 1.80 | 1.70 | 1.60 | 1.50 | 1.15 |
| | 120 | 160 | 4.70 | 4.15 | 3.75 | 3.50 | 3.30 | 3.10 | 3.00 | 2.85 | 2.75 | 2.50 | 2.35 | 2.20 | 2.05 | 1.95 | 1.55 |
| | 120 | 180 | 5.30 | 4.65 | 4.25 | 3.95 | 3.70 | 3.50 | 3.35 | 3.25 | 3.10 | 2.85 | 2.65 | 2.45 | 2.35 | 2.20 | 1.75 |
| | 120 | 200 | 5.85 | 5.15 | 4.70 | 4.35 | 4.10 | 3.90 | 3.75 | 3.60 | 3.45 | 3.15 | 2.95 | 2.70 | 2.60 | 2.45 | 1.95 |
| | 120 | 220 | 6.45 | 5.65 | 5.15 | 4.80 | 4.50 | 4.30 | 4.10 | 3.95 | 3.80 | 3.50 | 3.25 | 3.00 | 2.85 | 2.70 | 2.15 |
| | 120 | 240 | 7.00 | 6.15 | 5.65 | 5.20 | 4.90 | 4.65 | 4.50 | 4.30 | 4.15 | 3.75 | 3.50 | 3.30 | 3.10 | 2.95 | 2.35 |
| | 140 | 140 | 4.35 | 3.80 | 3.45 | 3.20 | 3.05 | 2.90 | 2.75 | 2.65 | 2.55 | 2.40 | 2.20 | 2.05 | 1.95 | 1.85 | 1.45 |
| | 140 | 200 | 6.10 | 5.40 | 4.95 | 4.60 | 4.30 | 4.10 | 3.95 | 3.80 | 3.65 | 3.40 | 3.15 | 2.95 | 2.80 | 2.65 | 2.15 |
| | 140 | 240 | 7.30 | 6.45 | 5.90 | 5.50 | 5.15 | 4.90 | 4.70 | 4.55 | 4.40 | 4.05 | 3.80 | 3.55 | 3.35 | 3.20 | 2.60 |
| | 160 | 160 | 5.15 | 4.55 | 4.10 | 3.80 | 3.60 | 3.45 | 3.30 | 3.15 | 3.05 | 2.90 | 2.70 | 2.55 | 2.40 | 2.25 | 1.85 |
| | 160 | 200 | 6.35 | 5.55 | 5.15 | 4.75 | 4.50 | 4.30 | 4.10 | 3.95 | 3.80 | 3.60 | 3.35 | 3.15 | 3.00 | 2.85 | 2.30 |
| | 160 | 240 | 7.60 | 6.75 | 6.10 | 5.70 | 5.40 | 5.15 | 4.90 | 4.70 | 4.55 | 4.30 | 4.05 | 3.80 | 3.60 | 3.40 | 2.80 |
| Trio | 180 | 180 | 5.95 | 5.30 | 4.80 | 4.45 | 4.20 | 4.00 | 3.85 | 3.70 | 3.60 | 3.40 | 3.20 | 3.00 | 2.85 | 2.70 | 2.20 |
| | 180 | 200 | 6.55 | 5.85 | 5.35 | 4.95 | 4.70 | 4.50 | 4.25 | 4.10 | 4.00 | 3.75 | 3.55 | 3.35 | 3.15 | 3.00 | 2.45 |
| | 180 | 220 | 7.25 | 6.40 | 5.85 | 5.45 | 5.15 | 4.90 | 4.70 | 4.50 | 4.35 | 4.10 | 3.90 | 3.70 | 3.50 | 3.30 | 2.70 |
| | 180 | 240 | 7.85 | 6.95 | 6.40 | 5.90 | 5.60 | 5.30 | 5.10 | 4.90 | 4.75 | 4.50 | 4.25 | 4.05 | 3.80 | 3.60 | 2.95 |
| | 200 | 200 | 6.80 | 6.00 | 5.50 | 5.10 | 4.85 | 4.60 | 4.40 | 4.25 | 4.10 | 3.85 | 3.70 | 3.50 | 3.35 | 3.15 | 2.60 |
| | 200 | 240 | 8.10 | 7.15 | 6.55 | 6.15 | 5.80 | 5.50 | 5.25 | 5.10 | 4.90 | 4.65 | 4.45 | 4.25 | 4.00 | 3.80 | 3.10 |
| | 240 | 240 | 8.40 | 7.60 | 6.95 | 6.50 | 6.10 | 5.85 | 5.60 | 5.40 | 5.25 | 4.90 | 4.70 | 4.50 | 4.35 | 4.15 | 3.40 |

* W = width; H = height
The design tables are intended as an aid for the preliminary design but are not a substitute for a structural design.

# Notes

# Notes

# Our sites

Sweden

**Bergkvist Siljan Insjön**
saw mill

**Bergkvist Siljan Blyberg**
saw mill

**Bergkvist Siljan Mora**
saw mill

**Bergkvist Siljan Skog**
round timber procurement

**Mayr-Melnhof Holz Wismar**
second transformation

Germany

The Czech Republic

**Mayr-Melnhof Holz Paskov**
saw mill, pellets production

**Mayr-Melnhof Holz Olsberg**
second transformation

Austria

**Mayr-Melnhof Holz Reuthe**
second transformation,
pellets production

KAUFMANN
BAUSYSTEME

**Mayr-Melnhof Holz Gaishorn am See**
second transformation

MMK

**Mayr-Melnhof Holz Leoben**
saw mill, pellets production,
second transformation

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