



## Facts on formwork timber beams:

### Wood types

- Spruce / Fir

### Beam height

- 20 cm

### Lengths

- Lengths up to 10 m

### Product standard

- Technical approval certificate  
Z-9.1-146

### Weight

- 4,6 kg / m

## Contents

|                |       |
|----------------|-------|
| Features       | 2 - 3 |
| Technical data | 4     |
| Span table     | 5     |

## Globally recognised quality

HT20plus is the internationally recognised brandname for concrete formwork beams of the Mayr-Melnhof Kaufmann Group. The worldwide unique protective cap system, the high quality finishing and the proven durability have made it what it is today: A successful brand par excellence!

The HT20plus is manufactured at the Reuthe factory in Bregenzwald, Austria and delivered from there to more than 60 worldwide.

The Kaufmann formwork beams have become one of the leading brands over more than 50 years. In the formwork industry the product is renowned for its exceptional quality.



## At a glance

- The shock-resistant, bevelled **protective cap** made of synthetic materials provides protection from splintering at the chord ends.
- Indestructible **finger-joints** between chords and webs.
- **The webs** made of 3-ply, laminated solid wood panels ensure high carrying capacity for continuous use in all climate zones.
- The inscription of the monitoring stamp, the length and production data provide **unique labelling** of the HT 20plus beams.
- **Guaranteed safety** based on certified quality by the German Institute of Structural Engineering.

## Many areas of application

- Ceiling formworks
- Wall formworks
- Bridge formworks
- Tunnel formworks
- Special formworks
- Scaffolding
- Working platforms





## Solid-wall I-joist beam for concrete formwork construction

The 20 cm high HT20plus is produced in various standard lengths. A patented, solid plastic cap prevents premature chipping on the chord ends. Moreover, the superior quality solid wood chords combined with triple laminated solid wood webs guarantee above-average durability.

Customers around the world rely on this quality product «Made in Austria». The HT 20plus does what it says – you can count on it!



**General technical approval certificate**  
Z - 9.1-146 (DIBt)



**Certificate of compliance**  
ÜZ - BWU03 - I 14.24.27  
(MPA Stuttgart)



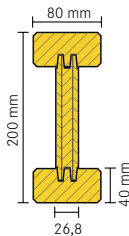
**PEFC**  
Chain of Custody



**ISO 9001**  
Quality management

|                           |  |
|---------------------------|--|
| <b>Product</b>            | Formwork timber beam, glued, solid-wall I-joist beams  |
| <b>Wood types</b>         | Spruce, fir, a mixture of wood types is permitted  |
| <b>Wood moisture</b>      | 12% +/- 3% at the time of delivery   |
| <b>Weight</b>             | 4,6 kg / m   |
| <b>Gluing</b>             | Melamine resin-based adhesive, Adhesive Type I acc. to EN 301 approved for gluing load-bearing timber components.  |
| <b>Chords</b>             | <ul style="list-style-type: none"> <li>Made of carefully selected class S 10 spruce wood according to DIN 4074</li> <li>Finger-jointed, solid wood cross-sections with a dimension of 80 x 40 mm</li> <li>Finger-jointing of the chords according to DIN 68140-1</li> <li>Web milling on the opposing side of the core (left-sided chord surface)</li> <li>Planed and chamfered to approx. 0.4 mm</li> </ul> |
| <b>Webs</b>               | 3-ply solid wood panel, laminated primarily showing vertical growth rings.   |
| <b>Design</b>             | Technical approval certificate Z-9.1-146 in conjunction with DIN 1052 or Eurocode 5 and EN 12812 apply for the design of the HT20plus formwork beams.  |
| <b>Surface protection</b> | The complete beam is waterproofed using a water-repellent colour glaze.  |
| <b>Supports</b>           | Thanks to the 3-ply solid wood webs, HT 20plus formwork beams can be cut into and supported at any lengths.  |

## Dimensions tolerances



| Dimensions <sup>1)</sup> | HT 20 plus | Tolerances <sup>2)</sup> |
|--------------------------|------------|--------------------------|
| <b>Beam height</b>       | 200 mm     | + / - 2,0 mm             |
| <b>Chord height</b>      | 40 mm      | - 1,5%                   |
| <b>Chord width</b>       | 80 mm      | - 1,5%                   |
| <b>Web thickness</b>     | 26,8 mm    | + / - 0,5 mm             |

<sup>1)</sup> These values apply at a wood moisture content of 12%

<sup>2)</sup> According to technical approval certificate Z-9.1-146

## Material properties

| Properties  | DIN1052-1:1988-04                      | DIN1052:2008-12 / Eurocode 5                   |
|---|--|--|
| <b>Strains</b>                                    | Permissible stress values              | Characteristic limits of load-bearing capacity |
| <b>Shear force</b>                                | zul Q = 11,0 kN                        | V <sub>k</sub> = 23,9 kN                       |
| <b>Bending moment</b>                             | zul M = 5,0 kNm                        | M <sub>k</sub> = 10,9 kNm                      |
| <b>Support</b>                                    | -                                      | R <sub>b,k</sub> = 47,8 kN                     |
| <b>Section modulus<sup>1)</sup></b>               | W <sub>x</sub> = 461 cm <sup>3</sup>   |  |
| <b>Geometrical moment of inertia<sup>1)</sup></b> | I <sub>x</sub> = 4.613 cm <sup>4</sup> |  |
| <b>Modulus of elasticity</b>                      | E = 10.000 N / mm <sup>2</sup>         |  |
| <b>Shear modulus</b>                              | G = 600 N / mm <sup>2</sup>            |  |

<sup>1)</sup> The values of the section modulus and the geometrical moment of inertia apply to new or used concrete formwork beams. An analogously increased factor of safety needs to be added for severely worn beams.

## Standard lengths

2,45 / 2,90 / 3,30 / 3,60 / 3,90 / 4,50 / 4,90 / 5,90 m / max. 10,0 m length

## Package units

Standard package  
60 pieces each



Container package  
100 pieces each



## Packaging

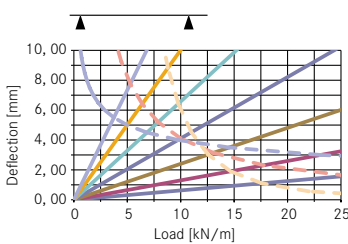
The packages are delivered suitable for the construction site and protected by integrated supporting timber.

## Permissible distances between main beams and supports

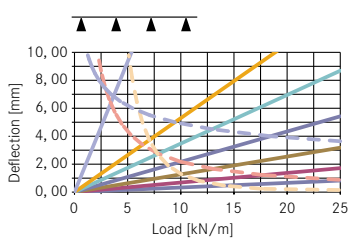
- Max. deflection:  $l / 500$
- Live load:  $1,5 \text{ kN} / \text{m}^2$  or 20% of concrete weight
- Permissible carrying force of the supports: min. 22 kN
- Technical specifications: Permissible moment = 5,0 kNm;  
Permissible shear force  $V = 11,0 \text{ kN}$

| Floor thickness<br>cm | Total load<br>kN / m <sup>2</sup> | Table 1: Crossbeams<br>Distance between crossbeams (m)                           |       |       |      | Table 2: Main beams<br>Selected distance between the main beams (m) |      |      |      |      |      |      |      |      |
|-----------------------|-----------------------------------|--|-------|-------|------|---|------|------|------|------|------|------|------|------|
|                       |                                   | 0,50   | 0,625 | 0,667 | 0,75 | 1,00  | 1,25 | 1,50 | 1,75 | 2,00 | 2,25 | 2,50 | 3,00 | 3,50 |
|                       |                                   | Max. permissible support width of the crossbeam<br>= distance between main beams |       |       |      | Max. permissible support width<br>= distance between supports       |      |      |      |      |      |      |      |      |
| 10                    | 4,35                              | 3,67   | 3,40  | 3,33  | 3,20 | 2,91  | 2,70 | 2,48 | 2,29 | 2,14 | 2,02 | 1,92 | 1,69 | 1,44 |
| 12                    | 4,87                              | 3,47   | 3,22  | 3,15  | 3,03 | 2,75  | 2,55 | 2,34 | 2,17 | 2,03 | 1,91 | 1,81 | 1,51 | 1,29 |
| 14                    | 5,39                              | 3,30   | 3,07  | 3,00  | 2,89 | 2,62  | 2,43 | 2,22 | 2,06 | 1,93 | 1,81 | 1,63 | 1,36 | 1,17 |
| 16                    | 5,91                              | 3,17   | 2,94  | 2,88  | 2,77 | 2,52  | 2,33 | 2,12 | 1,97 | 1,84 | 1,65 | 1,49 | 1,24 | 1,06 |
| 18                    | 6,43                              | 3,05   | 2,83  | 2,77  | 2,67 | 2,42  | 2,23 | 2,04 | 1,89 | 1,71 | 1,52 | 1,37 | 1,14 | 0,98 |
| 20                    | 6,95                              | 2,95   | 2,74  | 2,68  | 2,58 | 2,34  | 2,15 | 1,96 | 1,81 | 1,58 | 1,41 | 1,27 | 1,06 | 0,90 |
| 22                    | 7,47                              | 2,86   | 2,66  | 2,60  | 2,50 | 2,27  | 2,07 | 1,89 | 1,68 | 1,47 | 1,31 | 1,18 | 0,98 | 0,84 |
| 24                    | 7,99                              | 2,79   | 2,59  | 2,53  | 2,43 | 2,21  | 2,00 | 1,83 | 1,57 | 1,38 | 1,22 | 1,10 | 0,92 | 0,79 |
| 26                    | 8,51                              | 2,72   | 2,52  | 2,47  | 2,37 | 2,16  | 1,94 | 1,72 | 1,48 | 1,29 | 1,15 | 1,03 | 0,86 | 0,74 |
| 28                    | 9,03                              | 2,65   | 2,46  | 2,41  | 2,32 | 2,10  | 1,88 | 1,62 | 1,39 | 1,22 | 1,08 | 0,97 | 0,81 | 0,70 |
| 30                    | 9,61                              | 2,59   | 2,41  | 2,36  | 2,27 | 2,04  | 1,82 | 1,53 | 1,31 | 1,14 | 1,02 | 0,92 | 0,76 | 0,65 |
| 35                    | 11,17                             | 2,47   | 2,29  | 2,24  | 2,16 | 1,89  | 1,58 | 1,31 | 1,13 | 0,98 | 0,88 | 0,79 | 0,66 | 0,56 |
| 40                    | 12,73                             | 2,36   | 2,19  | 2,15  | 2,05 | 1,73  | 1,38 | 1,15 | 0,99 | 0,86 | 0,77 | 0,69 | 0,58 | 0,49 |
| 45                    | 14,29                             | 2,27   | 2,11  | 2,05  | 1,93 | 1,54  | 1,23 | 1,03 | 0,88 | 0,77 | 0,68 | 0,62 | 0,51 | 0,44 |
| 50                    | 15,85                             | 2,20   | 2,01  | 1,95  | 1,83 | 1,39  | 1,11 | 0,93 | 0,79 | 0,69 | 0,62 | 0,56 | 0,46 | 0,40 |
| 55                    | 17,41                             | 2,13   | 1,92  | 1,86  | 1,68 | 1,26  | 1,01 | 0,84 | 0,72 | 0,63 | 0,56 | 0,51 | 0,42 | 0,36 |
| 60                    | 18,97                             | 2,05   | 1,84  | 1,74  | 1,55 | 1,16  | 0,93 | 0,77 | 0,66 | 0,58 | 0,52 | 0,46 | 0,39 | 0,33 |
| 65                    | 20,53                             | 1,97   | 1,71  | 1,61  | 1,43 | 1,07  | 0,86 | 0,71 | 0,61 | 0,54 | 0,48 | 0,43 | 0,36 | 0,31 |
| 70                    | 22,09                             | 1,90   | 1,59  | 1,49  | 1,33 | 1,00  | 0,80 | 0,66 | 0,57 | 0,50 | 0,44 | 0,40 | 0,33 | 0,28 |
| 75                    | 23,65                             | 1,84   | 1,49  | 1,40  | 1,24 | 0,93  | 0,74 | 0,62 | 0,53 | 0,47 | 0,41 | 0,37 | 0,31 | 0,27 |
| 80                    | 25,21                             | 1,75   | 1,40  | 1,31  | 1,16 | 0,87  | 0,70 | 0,58 | 0,50 | 0,44 | 0,39 | 0,35 | 0,29 | 0,25 |
| 85                    | 26,77                             | 1,64   | 1,31  | 1,23  | 1,10 | 0,82  | 0,66 | 0,55 | 0,47 | 0,41 | 0,37 | 0,33 | 0,27 | 0,23 |
| 90                    | 28,33                             | 1,55   | 1,24  | 1,16  | 1,04 | 0,78  | 0,62 | 0,52 | 0,44 | 0,39 | 0,35 | 0,31 | 0,26 | 0,22 |
| 95                    | 29,89                             | 1,47   | 1,18  | 1,10  | 0,98 | 0,74  | 0,59 | 0,49 | 0,42 | 0,37 | 0,33 | 0,29 | 0,25 | 0,21 |
| 100                   | 31,45                             | 1,40   | 1,12  | 1,05  | 0,93 | 0,70  | 0,56 | 0,47 | 0,40 | 0,35 | 0,31 | 0,28 | 0,23 | 0,20 |

### Single span beam



### Multispan beam



- $l = 1,25 \text{ m}$
- $l = 1,50 \text{ m}$
- $l = 1,75 \text{ m}$
- $l = 2,00 \text{ m}$
- $l = 2,25 \text{ m}$
- $l = 2,50 \text{ m}$
- $l = 2,75 \text{ m}$
- $zul M$
- $zul Q$
- $zul f$

**Example of calculation:** Floor thickness: 20 cm, distance between crossbeams: 75 cm; we are looking for the distance between the main beams and the supports.

The permissible distance between main beams according to **table 1 = 2,58 m**. The identical or next smaller distance between main beams in **table 2 = 2,5 m**. Look for the permissible distance between supports in table 2, read downwards in column «2,50 m» and sideways in row «20 cm» floor thickness, the result is **1,27 m**. Caution! Examine the supports to ensure the corresponding carrying force.

