PRODUCT DATA SHEET

CONNECTO

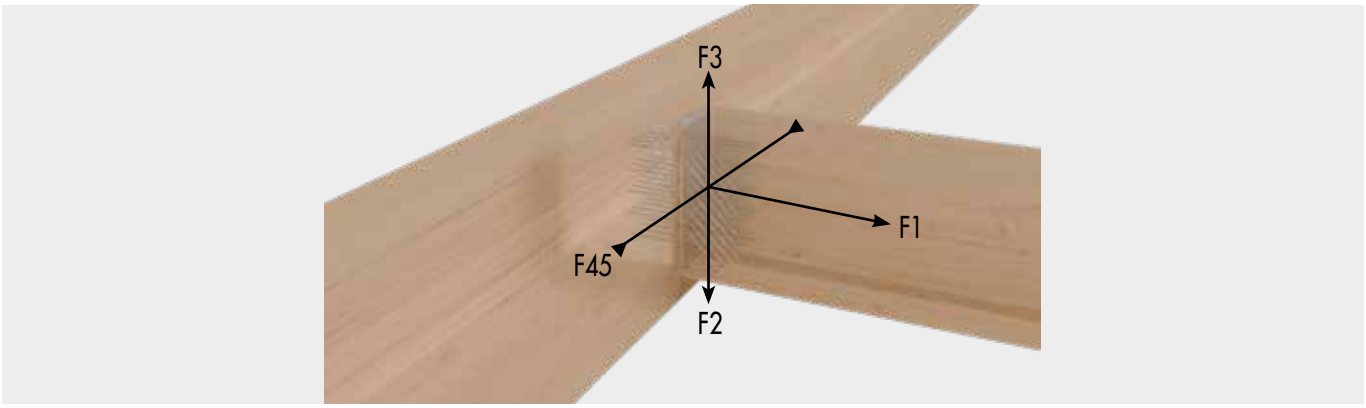
PRODUCT DESCRIPTION

Connecto is an innovative concealed timber-to-timber connector that provides high load carrying capacity for beam to beam and beam to column connections. The connectors are made of aluminium grade AW 6063-T66 with higher mechanical properties. Connecto connectors are suitable for Service Class 1 and 2 conditions. The screws are included in the scope of delivery.

ADVANTAGES / SPECIFICATIONS

- Easy installation
- High degree of prefabrication
- High load capacity
- Concealed connections

TECHNICAL INFORMATION



Principal force directions for Connecto connectors.

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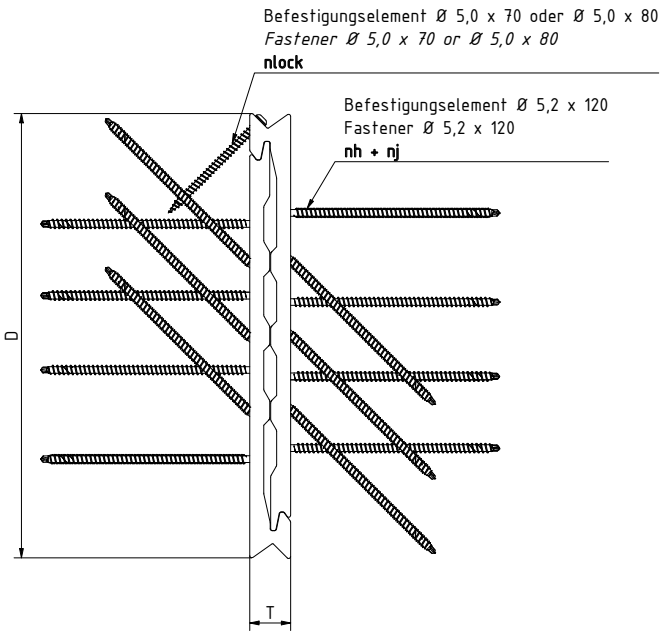
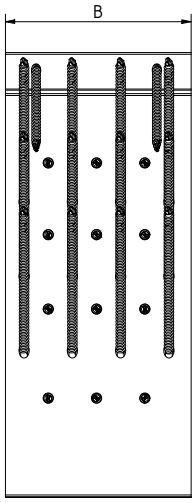
TECHNICAL INFORMATION





Connecto dimensions and number of screws							
Type	Width [b] [mm]	Depth [d] [mm]	Thickness [t] [mm]	Screw diameter [mm]	Header/Joist n_{90}	Header/Joist n_{45}	n_{lock}
Connecto H135 B50	50	135	22	5.2	3	2	1
Connecto H175 B50	50	175	22	5.2	3	4	1
Connecto H175 B75	75	175	22	5.2	6	6	2
Connecto H215 B75	75	215	22	5.2	6	9	2
Connecto H240 B75	75	240	22	5.2	8	9	2
Connecto H265 B100	100	265	22	5.2	12	16	2
Connecto H290 B100	100	290	22	5.2	15	16	2
Connecto H240 B125	125	240	22	5.2	16	15	2

The Table provides information with regards to connector dimensions and number of screws at 90° and at 45° as well as the number of locking screws for the connectors.

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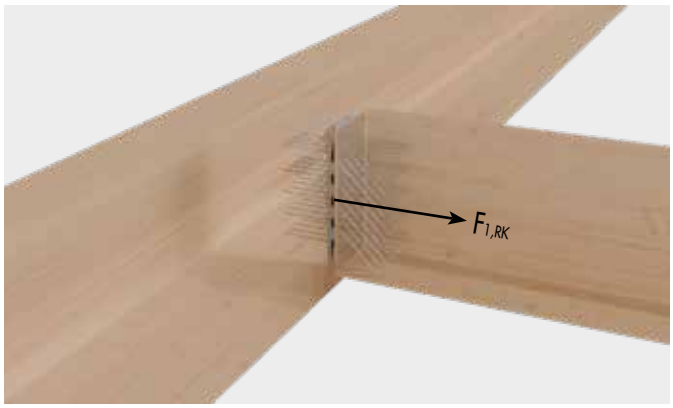
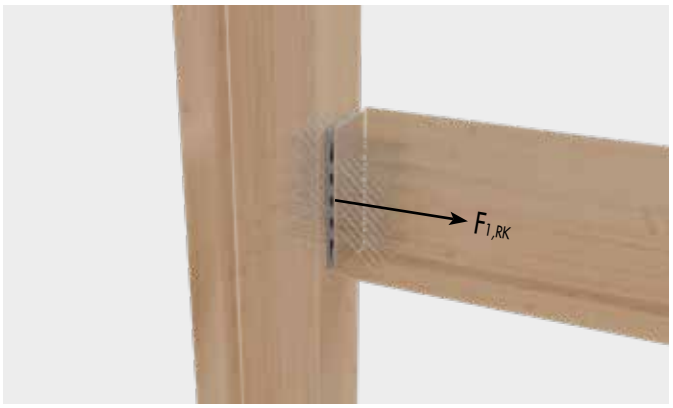
CONNECTOR CAPACITY TABLES

Characteristic axial load carrying capacity [$F_{1,Rk}$]

Characteristic $F_{1,Rk}$ capacity of Connecto connectors				
Type	Size B x D x T [mm]	Fastener Ø 5.2 x 120 $n_h + n_j$ [pcs]	$F_{1,Rk,timber}$ GL24h [kN]	$F_{1,Rk,alu}$ [kN]
Connecto H135 B50	50 x 135 x 22	5 + 5 = 10	8.4	21.7
Connecto H175 B50	50 x 175 x 22	7 + 7 = 14	8.4	16.7
Connecto H175 B75	75 x 175 x 22	12 + 12 = 24	15.8	28.4
Connecto H215 B75	75 x 215 x 22	15 + 15 = 30	15.8	26.8
Connecto H240 B75	75 x 240 x 22	17 + 17 = 34	20.4	21.9
Connecto H265 B100	100 x 265 x 22	28 + 28 = 56	29.4	42.5
Connecto H290 B100	100 x 290 x 22	31 + 31 = 62	35.9	32.2
Connecto H240 B125	125 x 240 x 22	31 + 31 = 62	38.1	40.1





Connection force direction $F_{1,Rk}$ in beam-to-beam and beam-to-column

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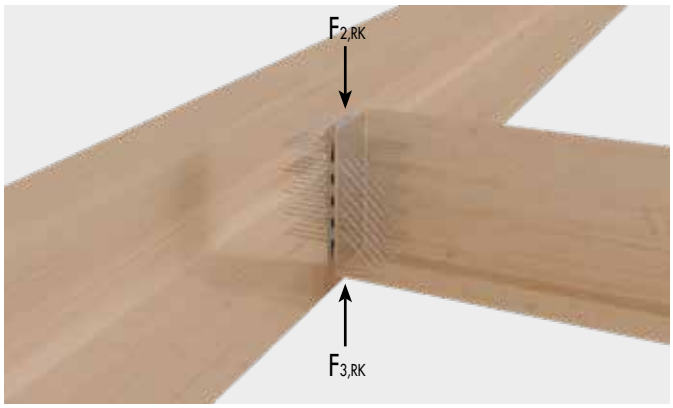
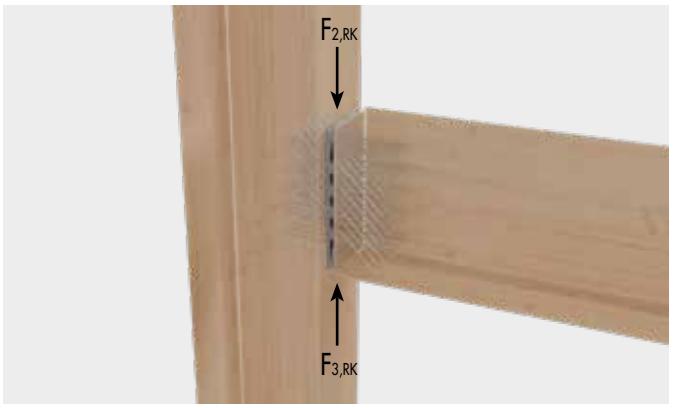
CONNECTOR CAPACITY TABLES

Vertical shear load carrying capacity [$F_{2,Rk}$ & $F_{3,Rk}$]

Characteristic $F_{2,Rk}$ and $F_{3,Rk}$ capacity of Connecto connectors						
Type	Size B x D x T [mm]	Fastener Ø 5.2 x 120 $n_h + n_j$ [pcs]	$F_{2,Rk,timber}$ GL24h [kN]	$F_{2,Rk,alu}$ [kN]	Fastener n_{lock} [pcs]	$F_{3,Rk,timber}$ GL24h [kN]
Connecto H135 B50	50 x 135 x 22	5 + 5 = 10	16.1	61.3	1	3.5
Connecto H175 B50	50 x 175 x 22	7 + 7 = 14	32.3	82.2	1	3.5
Connecto H175 B75	75 x 175 x 22	12 + 12 = 24	48.4	118.3	2	7
Connecto H215 B75	75 x 215 x 22	15 + 15 = 30	72.2	136.8	2	7
Connecto H240 B75	75 x 240 x 22	17 + 17 = 34	72.7	133.5	2	7
Connecto H265 B100	100 x 265 x 22	28 + 28 = 56	129.2	216.1	2	7
Connecto H290 B100	100 x 290 x 22	31 + 31 = 62	129.2	201.2	2	7
Connecto H240 B125	125 x 240 x 22	31 + 31 = 62	121.1	276.4	2	7





Connection force direction $F_{2,Rk}$ and $F_{3,Rk}$ in beam-to-beam and beam-to-column

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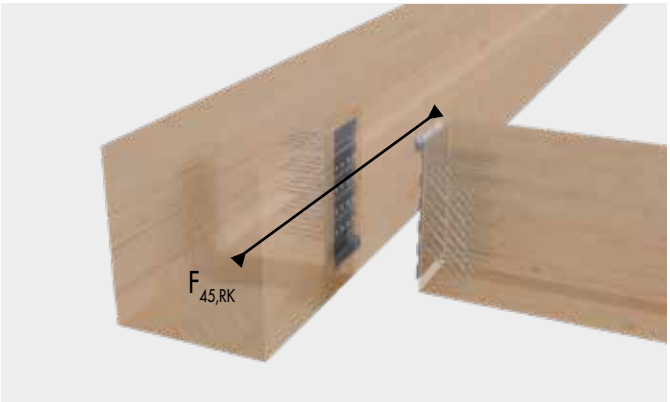
PRODUCT DATA SHEET CONNECTO

CONNECTOR CAPACITY TABLES

Characteristic horizontal shear load carrying capacity [$F_{45,Rk}$]

Characteristic typo $F_{45,Rk}$ capacity of Connecto connectors				
Type	Size B x D x T [mm]	Main beam recessing B_H x H_H [mm]	Bearing area [mm²]	$F_{45,Rk,timber}$ GL24h [kN]
Connecto H135 B50	50 x 135 x 22	140 x 160	1012.5	15.7
Connecto H175 B50	50 x 175 x 22	140 x 200	1312.5	22.7
Connecto H175 B75	75 x 175 x 22	140 x 200	1312.5	27.6
Connecto H215 B75	75 x 215 x 22	140 x 240	1612.5	33.9
Connecto H240 B75	75 x 240 x 22	140 x 280	1800	37.8
Connecto H265 B100	100 x 265 x 22	140 x 280	1987.5	41.7
Connecto H290 B100	100 x 290 x 22	140 x 320	2175	45.7
Connecto H240 B125	125 x 240 x 22	140 x 280	1800	37.8



Connection force direction in beam-to-beam

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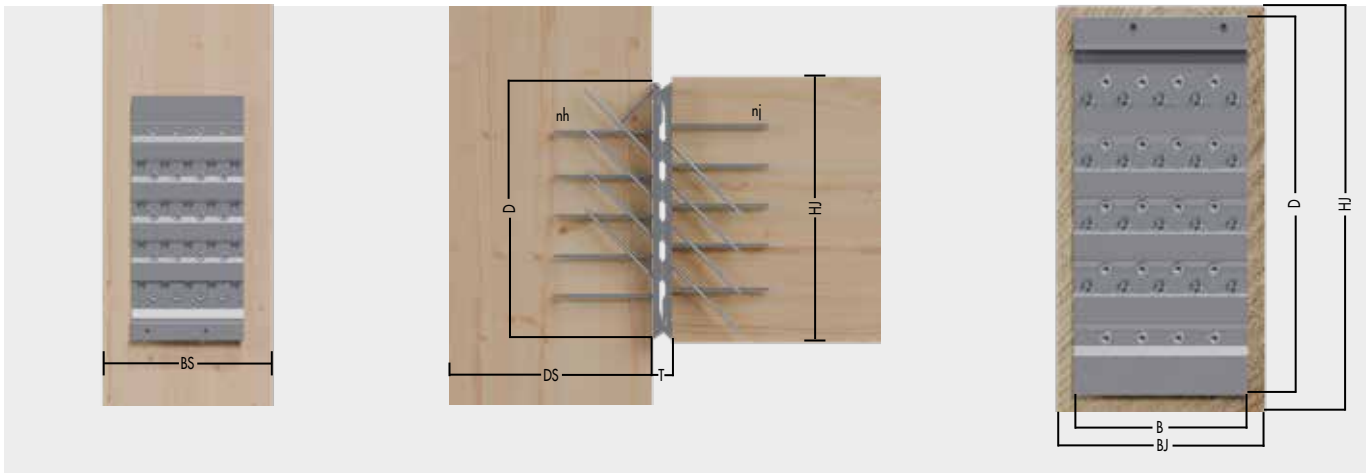
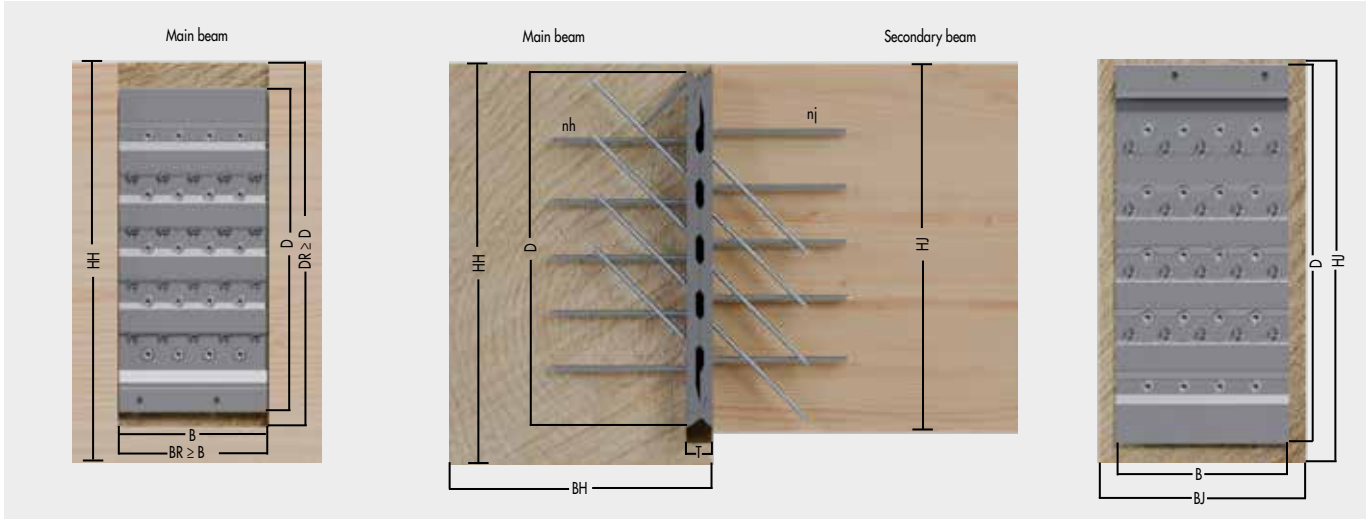


Exposed beam-to-column installation



Concealed beam-to-beam installation

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Required minimum structural member sections					
Type	Size B x D x T [mm]	Fastener Ø 5.2 x 120 $n_h + n_j$ [pcs]	Column* B_S x D_S [mm]	Main beam* B_H x H_H [mm]	Secondary beam* B_J x H_J [mm]
Connecto H135 B50	50 x 135 x 22	5 + 5 = 10	80 x 140	140 x 160	80 x 160
Connecto H175 B50	50 x 175 x 22	7 + 7 = 14	80 x 140	140 x 200	80 x 200
Connecto H175 B75	75 x 175 x 22	12 + 12 = 24	100 x 140	140 x 200	100 x 200
Connecto H215 B75	75 x 215 x 22	15 + 15 = 30	100 x 140	140 x 240	100 x 240
Connecto H240 B75	75 x 240 x 22	17 + 17 =34	100 x 140	140 x 280	100 x 280
Connecto H265 B100	100 x 265 x 22	28 + 28 = 56	120 x 140	140 x 280	120 x 280
Connecto H290 B100	100 x 290 x 22	31 + 31 = 62	120 x 140	140 x 320	120 x 320
Connecto H240 B125	125 x 240 x 22	31 + 31 = 62	140 x 140	140 x 280	140 x 280

* The minimum required cross-sections specified for the column and main beam are based on a single-sided connection using Connecto connectors. In the case of a double-sided connection, the column and beam dimensions must be increased accordingly to prevent interference between screw groups from opposing sides.
* Furthermore, the influence of fire protection has not been accounted for in the derivation of the aforementioned minimum member sizes. A detailed design assessment is required to ensure that the connectors are provided with an adequate protective layer to satisfy the specified fire resistance duration.

GENERAL NOTES

- The design and structural verification of the timber elements must be conducted independently. Specifically, for loading conditions acting perpendicular to the longitudinal axis of the beams, it is advisable to perform a splitting failure assessment on both timber components.
- The structural design of the Connecto connectors allows flexibility in the number of 90° screws, as these screws are solely responsible for resisting axial forces (F_1). If no axial F_1 force is present in the connection, the necessity for installing 90° screws may be determined at the discretion of the Project Structural Engineer.
- The resistance of Connecto connectors to loads acting in the F_2 direction relies exclusively on the 45° screws. Consequently, it is imperative that all designated holes for 45° screws in the connector plate are fully populated to ensure structural integrity.
- Similarly, the resistance of Connecto connectors to loading in the F_3 direction is entirely provided by the locking screws. It is recommended to install these screws even in the absence of F_3 loading, as they contribute to the overall stability of the connection during structural assembly. The coefficients k_{mod} and γ_M should be taken according to the current regulations used for the calculation.
- Recessing of the Connecto connectors should be limited to the main beam when F_{45} directional loading is present. In the absence of such loading, the connectors may alternatively be recessed into the secondary beam or column.
- The following verification shall be satisfied for combined loading:

$$\left(\frac{F_{1,Ed}}{F_{1,Rd}}\right)^2 + \left(\frac{F_{2,Ed}}{F_{2,Rd}}\right)^2 + \left(\frac{F_{3,Ed}}{F_{3,Rd}}\right)^2 + \left(\frac{F_{45,Ed}}{F_{45,Rd}}\right)^2 \leq 1$$

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- $F_{2,d}$ and $F_{3,d}$ are forces acting in opposite directions. Therefore, only one of the forces $F_{2,d}$ and $F_{3,d}$ can act in combination with the forces $F_{1,d}$ or $F_{45,d}$.
- Characteristic values calculated according to EN 1995:2014 and ETA-11/0024 for screws without pre-drilling hole and GL24h timber elements with density of ρ_k = 385 kg/m³.
- Particular attention must be given to the precision of routing execution in the primary or secondary timber elements to minimize the risk of lateral displacement within the connection. A tolerance gap of no more than 2 mm should also be maintained.
- In accordance with Eurocode 5 (EN 1995-1-1), design values are derived from characteristic values by applying the appropriate partial safety factor γ_M and the modification factor k_{mod} to account for load duration and service class conditions. The design value R_d is calculated as follows:

$$R_{1,d} = \min\left\{\frac{R_{1,k,timber} \cdot k_{mod}}{\gamma_M}, \frac{R_{1,k,alu}}{\gamma_{M2}}\right\}$$

$$R_{2,d} = \min\left\{\frac{R_{2,k,timber} \cdot k_{mod}}{\gamma_M}, \frac{R_{2,k,alu}}{\gamma_{M2}}\right\}$$

$$R_{3,d} = \frac{R_{3,k,timber} \cdot k_{mod}}{\gamma_M}$$

$$R_{45,d} = \frac{R_{45,k,timber} \cdot k_{mod}}{\gamma_M}$$

Where:

- R_d = design value
- R_k = characteristic value
- k_{mod} = modification factor (dependent on load duration and service class)
- γ_M = partial safety factor (material-specific, typically 1.3 for solid timber in ULS design)
- γ_{M2} represents the partial safety factor for aluminium components subjected to tensile stress. Its value should be determined in accordance with the applicable national design standards. In the absence of specific national provisions, it is recommended to adopt the value specified in EN 1999-1-1, namely γ_{M2} = 1.25.

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PRODUCT TABLE

Connecto			
Art. no.	Designation	Dimension [mm]	PU
944010	Connecto H135 B50	135 x 50	10
944011	Connecto H175 B50	175 x 50	10
944012	Connecto H175 B75	175 x 75	10
944013	Connecto H215 B75	215 x 75	10
944015	Connecto H265 B75	240 x 75	10
944017	Connecto H215 B100	240 x 125	10
944019	Connecto H265 B100	265 x 100	10
944022	Connecto H265 B125	290 x 100	10

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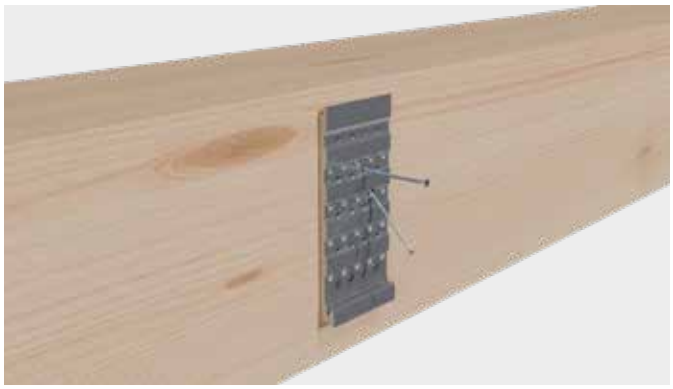
ASSEMBLY INSTRUCTIONS – EXPOSED



Step 1: Position the Connecto on the main beam and fasten the screws.

Step 2: Position the Connecto on the secondary beam and fasten the screws.

Step 3: Hook the secondary beam in from top to bottom. Ensure that both Connecto parts are aligned parallel to each other to avoid excessive stress during assembly.

Step 4: Finally, secure the Connecto using the locking screws provided (Ø 5 mm).

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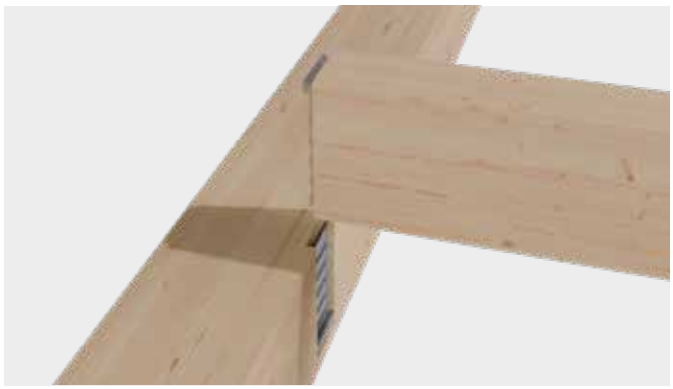
PRODUCT DATA SHEET CONNECTO

ASSEMBLY INSTRUCTIONS – CONCEALED

Step 1: Position the Connecto on the main beam and fasten the screws.

Step 2: Position the Connecto on the secondary beam and fasten the screws.



Step 3: Hook the secondary beam in from top to bottom. Ensure that both Connecto parts are aligned parallel to each other to avoid excessive stress during assembly.

Step 4: Finally, secure the Connecto using the locking screws provided (Ø 5 mm).

If you are not familiar with how this product is used, and particularly with the product's intended use, please contact our Application Technology department (Technik@eurotec.team).

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