

VGU PLATE T TIMBER



PLATE FOR TENSILE LOADS

MOMENT RESISTING JOINT

In combination with the VGU washer and VGS screws, it enables the transfer of moment stresses into the beam-column joints.

TENSION JOINT

Thanks to the use of VGS screws arranged at 45°, the high tensile forces can be transferred.

EASY INSTALLATION

The plate is equipped with slots for housing the VGU washers that allow the VGS screws to be inserted at 45°.



CHARACTERISTICS

FOCUS	beam-column moment joints
TIMBER SECTIONS	from 120 x 120 mm to 280 x 400 mm
MOMENT STRENGTH	M_k up to 20 kNm
FASTENERS	VGU, VGS



MATERIAL

Bright zinc plated carbon steel, two dimensional perforated plate.

FIELDS OF USE

- solid timber and glulam
 - CLT, LVL
- Service classes 1 and 2.



CARPORTS AND PERGOLAS

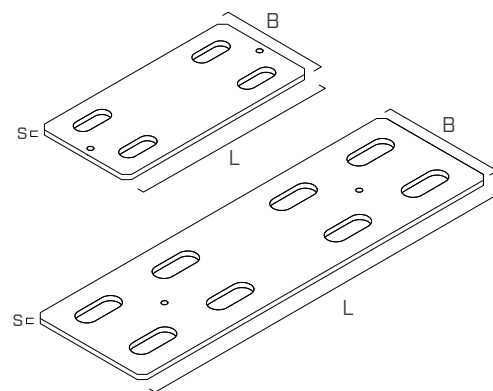
Thanks to the interlocking beam-column joint that can be created with VGU PLATE T, VGU and VGS, small portals can be easily built.

TENSION AND COMPRESSION

The moment joint is broken down into a tension action absorbed by the VGU PLATE T plate and a compression action absorbed by the timber or, as in this case, by the DISC FLAT concealed connector.

CODES AND DIMENSIONS

CODE	B [mm]	L [mm]	s [mm]		pcs
VGUPLATET185	88	185	3	●	1
VGUPLATET350	108	350	4	●	1



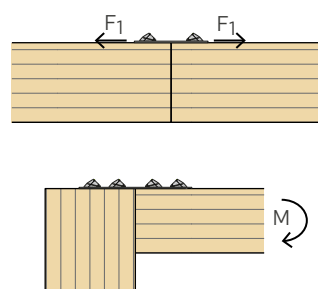
MATERIAL AND DURABILITY

VGU PLATE T: bright zinc plated carbon steel.
To be used in service classes 1 and 2 (EN 1995-1-1)

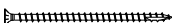
FIELD OF USE

- Timber-to-timber joints

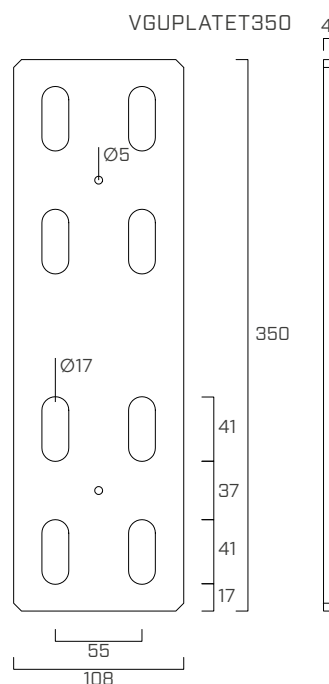
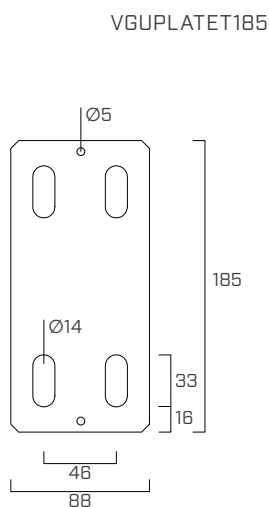
EXTERNAL LOADS



ADDITIONAL PRODUCTS

type	description		d [mm]	support	page
VGS	full thread screw		9-11		564
VGU	45° washer		9-11		124

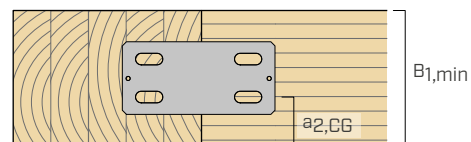
GEOMETRY



■ INSTALLATION AND MINIMUM DISTANCES

DISTANCE FROM EDGE $a_{4,c}$

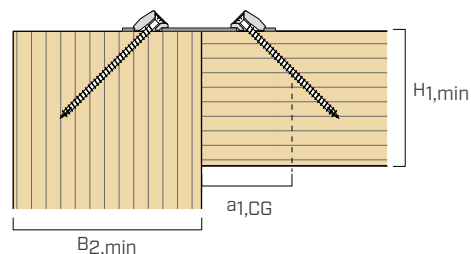
	d screw [mm]	$a_{4,c}$ [mm]	$B_{1,min}$ [mm]
VGUPLATET185	9	$\geq 4d$ 36	120
VGUPLATET350	11	$\geq 4d$ 44	150



DISTANCE BETWEEN SCREW BARICENT AND LOADED END $a_{1,cg}$

	d screw [mm]	$a_{1,cg}$ [mm]	$L_{screw,min}^{(1)}$ [mm]	$H_{1,min}^{(1)}$ [mm]	$B_{2,min}^{(1)}$ [mm]
VGUPLATET185	9	$\geq 10d$ 90	120	90	150
VGUPLATET350	11	$\geq 10d$ 110	175	125	260

⁽¹⁾ Valid limit value considering the centerline of the plate centered at the interface of the timber elements, using all connectors.

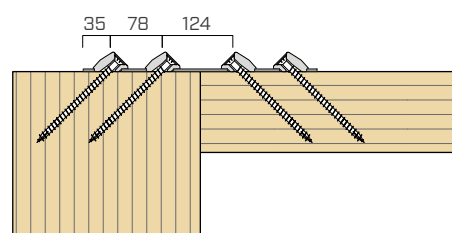
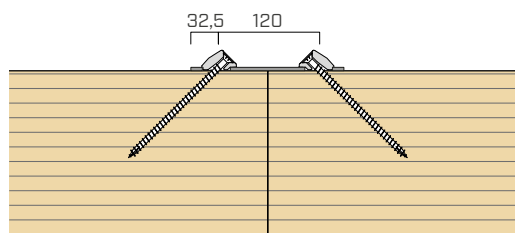


POSITIONING

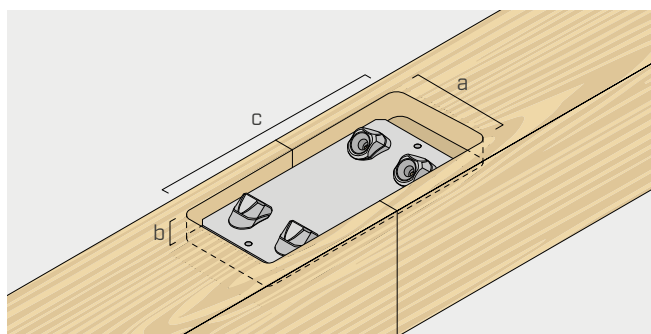
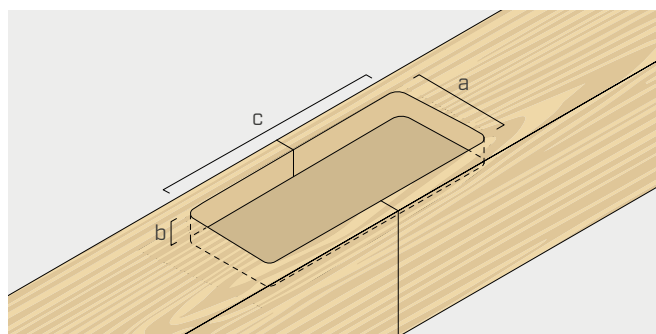
The VGU PLATE T plates can be used in tensile or moment connections; positioning must be carried out in compliance with the minimum distances for inclined screws.

The Ø5 holes are designed to position the plate with LBA Ø4/LBS Ø5 before fastening the inclined screws with washer; for VGU assembly details see page 128-129

The fixed spacing between the connectors for both plates is indicated.



Depending on the design requirements, it is possible to create a concealed connection by grooving the timber elements according to the indications on the table.

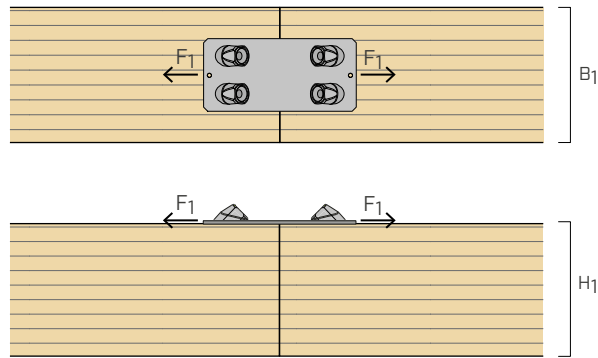


Grooving dimensions

	a [mm]	b [mm]	c [mm]
VGUPLATET185	90	25	215
VGUPLATET350	110	30	380

■ STATIC VALUES

TENSION JOINTS



CODE	element dimensions		R _{1,k} screw					R _{1,k} steel plate
			VGU	fasteners VGS - d ₁ x L [mm]	n _v pcs	R _{1,k} ax [kN]	R _{1,k} tens [kN]	R _{1,k} plate [kN]
VGUPLATET185	120	160	VGU945	9 x 220	2+2	32,1	35,9	39,3
		200		9 x 260	2+2	38,6		
	140	200		9 x 260	2+2	38,6		
		240		9 x 320	2+2	48,2		
	160	240		9 x 320	2+2	48,2		
		280		9 x 380	2+2	57,9		
VGUPLATET350	160	200	VGU1145	11 x 275	4+4	91,6	100,3	95,9
		240		11 x 325	4+4	110,0		
	180	240		11 x 325	4+4	110,0		
		280		11 x 375	4+4	128,3		
	200	280		11 x 375	4+4	128,3		
		320		11 x 450	4+4	155,8		

GENERAL PRINCIPLES:

- Characteristic values are consistent with EN 1995-1-1 and ETA-11/0030.
- The design values are obtained from the characteristic values as follows:

$$R_d = \min \left\{ \begin{array}{l} \frac{R_{1,k \text{ ax}} \cdot k_{mod}}{\gamma_{timber}} \\ \frac{R_{1,k \text{ tens}}}{\gamma_{Msteel}} \\ \frac{R_{1,k \text{ steel}}}{\gamma_{Msteel}} \end{array} \right. \quad M_d = \min \left\{ \begin{array}{l} \frac{M_{k \text{ timber}} \cdot k_{mod}}{\gamma_{Mtimber}} \\ \frac{M_{k \text{ steel}}}{\gamma_{Msteel}} \end{array} \right.$$

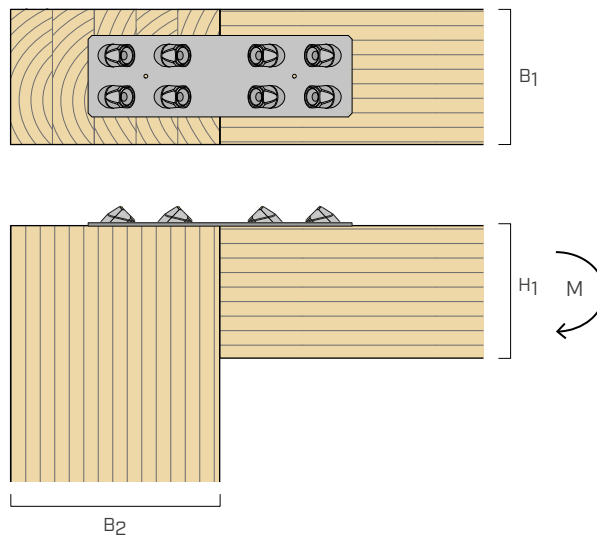
γ_{Msteel} should be taken as γ_{M2}

The coefficients k_{mod} , γ_M and γ_{M2} should be taken according to the current regulations used for the calculation.

- For the calculation process a timber density $\rho_k = 385 \text{ kg/m}^3$ has been considered.
- Dimensioning and verification of the timber elements must be carried out separately. When used for moment joints, a suitable connection system must be used to absorb shear loads.
- The strength values of the connection system are valid under the calculation hypotheses listed in the table; for different boundary conditions shall be verified.

■ STATIC VALUES

BEAM-COLUMN MOMENT JOINT



CODE	elements dimensions			VGU	fasteners		M_k timber ⁽²⁾ [kNm]	M_k steel ⁽²⁾ [kNm]
	$B_2^{(1)}$ [mm]	B_1 [mm]	H_1 [mm]		VGS - $d_1 \times L$ [mm]	n_v pcs		
VGUPLATET185	220	120	160	VGU945	9 x 220	2+2	2,9	4,0
	240		200		9 x 260	2+2	4,5	5,0
	240	140	200		9 x 260	2+2	5,1	5,0
	290		240		9 x 320	2+2	7,3	6,0
	290	160	240		9 x 320	2+2	8,1	6,1
	330		280		9 x 380	2+2	11,2	7,1
VGUPLATET350	330	160	200	VGU1145	11 x 275	4+4	6,7	11,6
	370		240		11 x 325	4+4	9,6	13,9
	370	180	240		11 x 325	4+4	10,6	14,0
	400		280		11 x 375	4+4	14,4	16,4
	400	200	280		11 x 375	4+4	15,8	16,5
	460		320		11 x 450	4+4	20,8	18,8

NOTES:

⁽¹⁾ Minimum column dimensions using the screw lengths in the table, considering the plate centred at the interface of the timber elements.

⁽²⁾ Strength moments calculated with elastic-linear bonds, considering the deformability of the screws in the stress distribution.