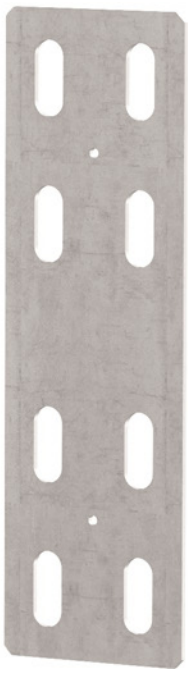
VGU PLATE T TIMBER

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

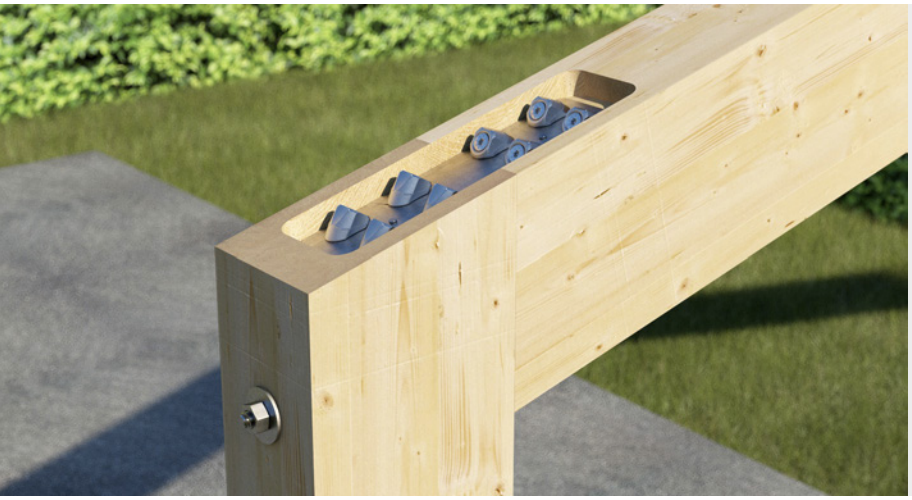
MATERIAL

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

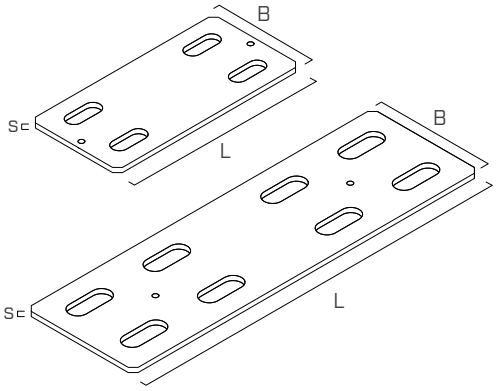
Thanks to the interlocking beam-column joint that can be created with VGU PLATE T, VGU and VGS, small portals can be easily built.

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



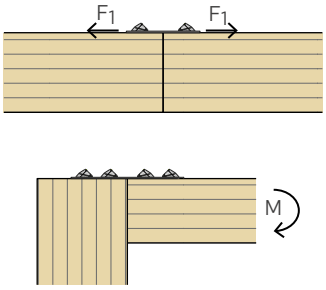
MATERIAL AND DURABILITY

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

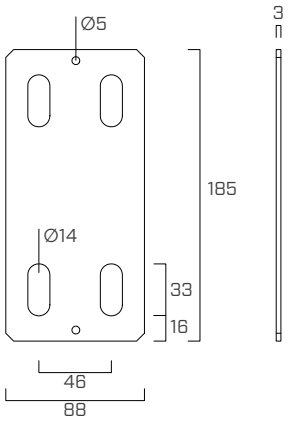


ADDITIONAL PRODUCTS

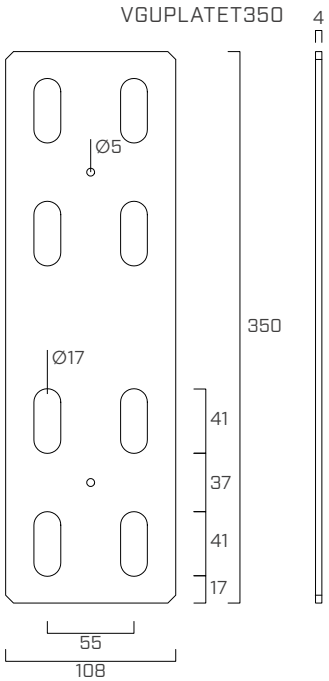
type	description		d [mm]	support	page
VGS	full thread screw		9-11		564
VGU	45° washer		9-11		124

GEOMETRY

VGUPLATET185



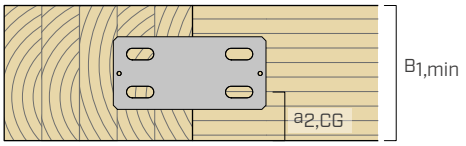
VGUPLATET350



INSTALLATION AND MINIMUM DISTANCES

DISTANCE FROM EDGE $a_{4,C}$

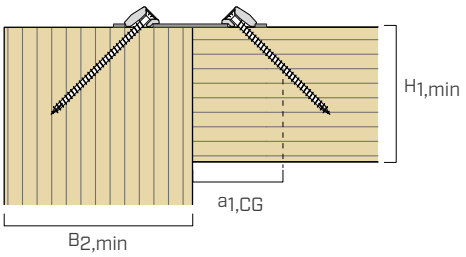
	d screw [mm]	$a_{4,c}$ [mm]		$B_{1,min}$ [mm]
VGUPLATET185	9	≥ 4d	36	120
VGUPLATET350	11	≥ 4d	44	150



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

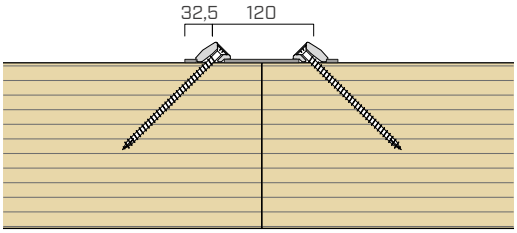
	d screw [mm]	$a_{1,CG}$ [mm]		$L_{screw,min}$ [mm]	$H_{1,min}$ [mm]	$B_{2,min}$ [mm]
VGUPLATET185	9	≥ 10d	90	120	90	150
VGUPLATET350	11	≥ 10d	110	175	125	260

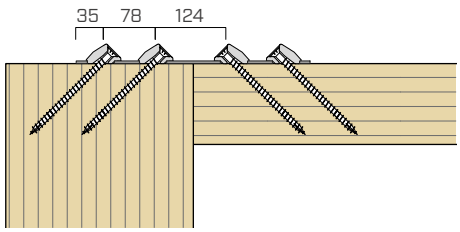
(1) Valid limit value considering the centerline of the plate centered at the interface of the timber elements, using all connectors.



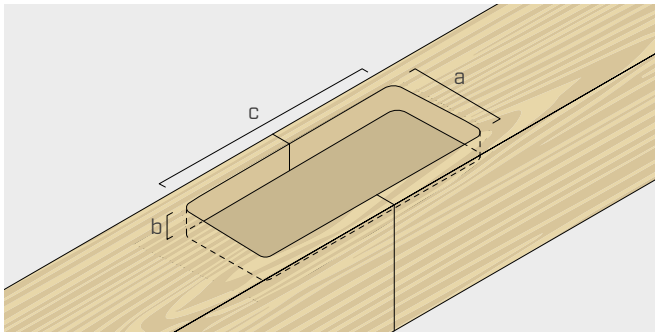
POSITIONING

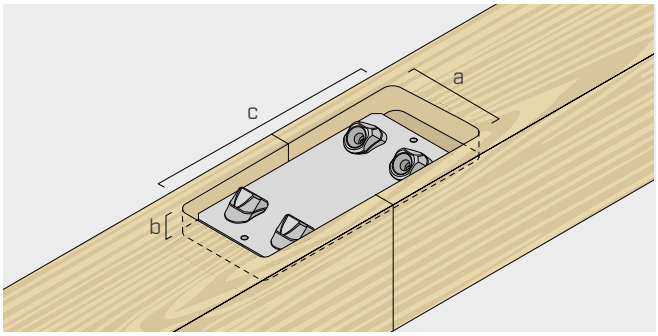
The VGU PLATE T plates can be used in tensile or moment connections; positioning must be carried out in compliance with the minimum distances for inclined screws.
The Ø5 holes are designed to position the plate with LBA Ø4/LBS Ø5 before fastening the inclined screws with washer; for VGU assembly details 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.



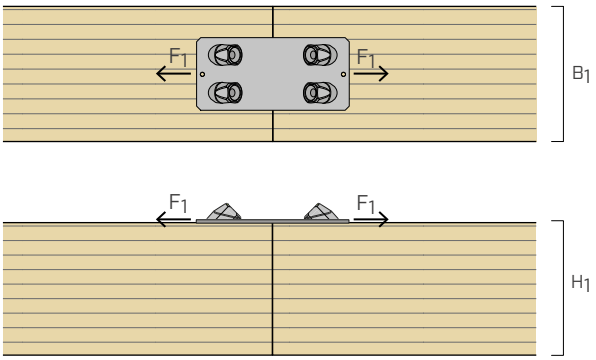


Grooving dimensions

	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
			fasteners			$R_{1,k\ ax}$	$R_{1,k\ tens}$	$R_{1,k\ plate}$
	B_1 [mm]	H_1 [mm]	VGU	VGS - d_1 x L [mm]	n_v pcs	[kN]	[kN]	[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:

$$R_d = min\left\{\frac{R_{1,k\,ax}.k_{mod}}{\gamma_{timber}};\ \frac{R_{1,k\,tens}}{\gamma_{Msteel}};\ \frac{R_{1,k\,steel}}{\gamma_{Msteel}}\right\} \qquad M_d = min\left\{\frac{M_{k\,timber}.k_{mod}}{\gamma_{Mtimber}};\ \frac{M_{k\,steel}}{\gamma_{Msteel}}\right\}$$

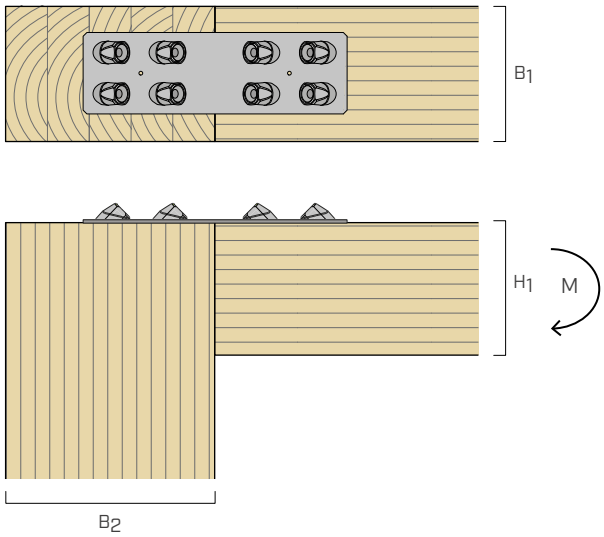
γ_{Msteel} should be taken as γ_{M2}

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 ρ_k = 385 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			fasteners			$M_{k\ timber}$ [2]	$M_{k\ steel}$ [2]
	B_2 [1]	B_1	H_1	VGU	VGS - d_1 x L	n_v		
	[mm]	[mm]	[mm]		[mm]	pcs	[kNm]	[kNm]
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.