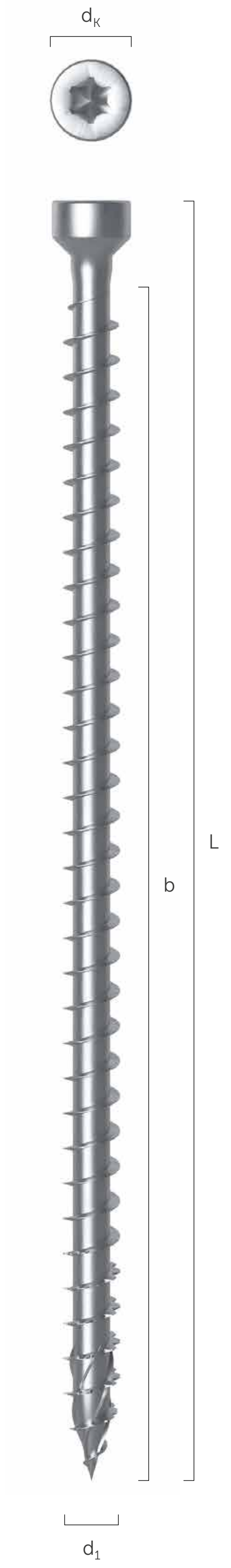
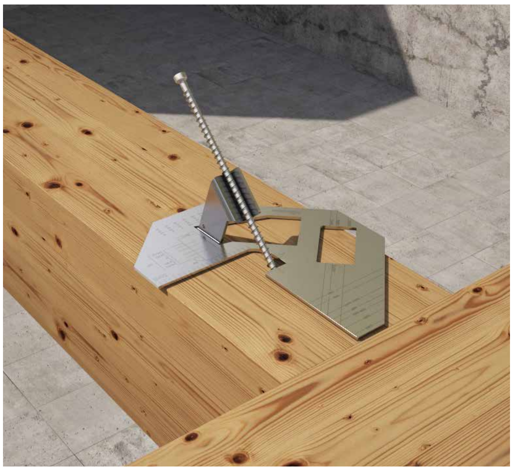


GWZ

CE
ETA

FULL THREAD SCREW WITH CYLINDRICAL HEAD

- Ideal for joining beams by concealed fastening without visible hardware, for sewing the joints of CLT ceiling and wall panels
- The cylindrical head is ideal for concealed joints. Guarantees fire protection and seismic performance
- Deep thread and high resistance steel for excellent tensile performance
- Ideal for making gazebos and terrace substructures



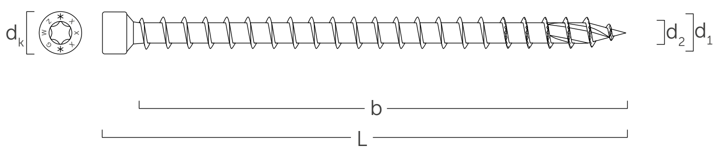
MATERIAL: carbon steel with bright zinc plated

d_1 [mm]	d_K [mm]	CODE	L [mm]	b [mm]	pcs
6 TX 30	8,00	GWZ6100	100	90	25
		GWZ6120	120	110	25
		GWZ6140	140	130	25
		GWZ6160	160	150	25
		GWZ6180	180	170	25
		GWZ6200	200	190	25
		GWZ6220	220	210	25
8 TX 40	11,00	GWZ8120	120	110	25
		GWZ8140	140	130	25
		GWZ8160	160	150	25
		GWZ8180	180	170	25
		GWZ8200	200	190	25
		GWZ8220	220	210	25
		GWZ8240	240	230	25
		GWZ8260	260	250	25
		GWZ8280	280	270	25
		GWZ8300	300	290	25
		GWZ8320	320	310	25
		GWZ8340	340	330	25
		GWZ8360	360	350	25
		GWZ8380	380	370	25
		GWZ8400	400	390	25

SPREADSHEET "GWZ CALCULATOR"

Download "GWZ calculator" from www.holztechnic.com

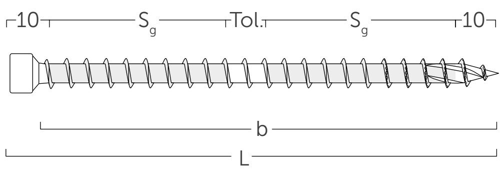
GEOMETRY AND MECHANICAL CHARACTERISTICS



nominal diameter	d_1	[mm]	6	8
head diameter	d_K	[mm]	8,00	11,00
thread diameter	d_2	[mm]	4,00	5,20
pre-drilling hole diameter(1)	d_V	[mm]	4,0	5,0
characteristic yield moment	$M_{y,k}$	[Nm]	10,0	20,0
characteristic withdrawal-resistance parameter(2)	$f_{ax,k}$	[N/mm²]	11,0	11,0
characteristic tensile strength	$f_{tens,k}$	[kN]	12,0	21,0
characteristic yield strength	$f_{y,k}$	[kN]	1000	1000

(1) Pre-drilling valid for softwood.
(2) Associated density ρ_a = 350 kg/m³.

EFFECTIVE THREAD USED IN CALCULATION



b = L - 10 mm — represents the entire length of the threaded part

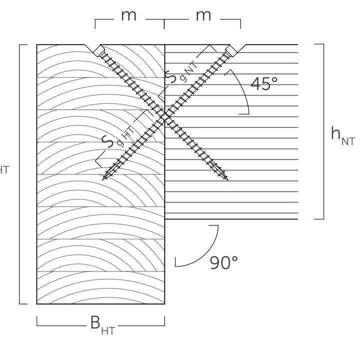
S_g = (L - 10 mm - 10 mm - Tol.)/ 2 — represents the partial length of the threaded part net of a laying tolerance (Tol.) of 10 mm

The timber to timber withdrawal, shear and sliding values were calculated considering the centre of gravity of the connector placed in correspondence with the shear plane.

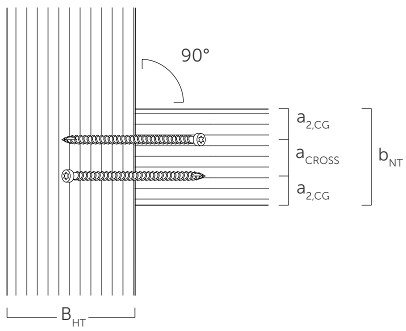
MINIMUM DISTANCES FOR CROSS SCREWS

SHEAR CONNECTION WITH CROSSED CONNECTORS

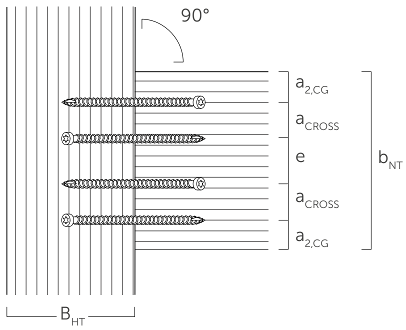
section



plan - 1 pair



plan - 2 or more pairs



MINIMUM RECOMMENDED DISTANCES

d_1 [mm]	$a_{2,CG}$ [mm]	a_{CROSS} [mm]	e [mm]
6	24	9	21
8	32	12	28

STRUCTURAL VALUES

SHEAR CONNECTION WITH CROSSED CONNECTORS
90-DEGREE JOINT - MAIN BEAM / SECONDARY BEAM

d_1 [mm]	L [mm]	$S_{g\,HT}$ (1) [mm]	$S_{g\,NT}$ (1) [mm]	$B_{HT\,min}$ [mm]	$H_{HT\,min} = h_{NT\,min}$ [mm]	$b_{NT\,min}$ [mm]	No. pairs	withdrawal $R_{1V,k}$ (2) [kN]	instability $R_{2V,k}$ (2) [kN]	m(3) [mm]
6	140	40	70	65	120	57	1	4,0	10,2	63
						87	2	7,5	19,0	
						117	3	10,8	27,4	
	160	60	70	75	135	57	1	6,0	10,2	63
						87	2	11,3	19,0	
						117	3	16,2	27,4	
	180	75	75	80	150	57	1	6,9	10,2	66
						87	2	12,8	19,0	
						117	3	18,5	27,4	
	200	85	85	90	160	57	1	7,8	10,2	74
						87	2	14,5	19,0	
						117	3	20,9	27,4	
	220	95	95	95	175	57	1	8,7	10,2	81
						87	2	16,2	19,0	
						117	3	23,4	27,4	
8	200	65	105	90	165	76	1	8,7	17,6	89
						116	2	16,3	32,8	
						156	3	23,5	47,3	
	220	85	105	95	175	76	1	11,4	17,6	89
						116	2	21,3	32,8	
						156	3	30,7	47,3	
	240	105	105	100	190	76	1	12,8	17,6	89
						116	2	23,9	32,8	
						156	3	34,5	47,3	
	260	115	115	110	205	76	1	14,0	17,6	96
						116	2	26,2	32,8	
						156	3	37,7	47,3	
	280	125	125	115	220	76	1	15,3	17,6	103
						116	2	28,5	32,8	
						156	3	41,0	47,3	
	300	135	135	125	235	76	1	16,5	17,6	110
						116	2	30,8	32,8	
						156	3	44,3	47,3	
	320	145	145	130	250	76	1	17,7	17,6	117
						116	2	33,0	32,8	
						156	3	47,6	47,3	
	340	155	155	140	260	76	1	18,9	17,6	124
						116	2	35,3	32,8	
						156	3	50,9	47,3	
	360	165	165	145	275	76	1	20,1	17,6	131
						116	2	37,6	32,8	
						156	3	54,2	47,3	
	380	175	175	150	290	76	1	21,4	17,6	138
						116	2	39,9	32,8	
						156	3	57,4	47,3	
	400	185	185	160	305	76	1	22,6	17,6	145
						116	2	42,2	32,8	
						156	3	60,7	47,3	

NOTES

(1) The values given are calculated considering a distance $a_{1,CG} \geq 5d$. In some cases the asymmetrical laying of connectors is needed ($S_{g\,HT} \neq S_{g\,NT}$).
(2) The compression design strength of the connector is the lower between the withdrawal-side design strength ($R_{1V,d}$) and the instability design strength ($R_{2V,d}$).

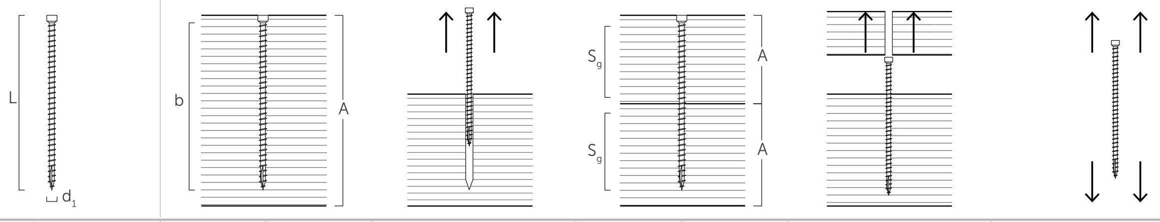
$$R_{V,d} = min \begin{cases} \dfrac{R_{1V,k} \cdot k_{mod}}{\gamma_M} \\ \dfrac{R_{2V,k}}{\gamma_{M1}} \end{cases}$$

The coefficients γ_M and k_{mod} should be taken according to the current regulations used for the calculation.
(3) The assembly height (m) applies in the event of symmetrical installation of the flush connectors ($S_{g\,HT} = S_{g\,NT}$) above the elements.
In the case of asymmetric installation, it is necessary to provide for installation of the connectors on the main beam side with the head buried so as to guarantee the effective lengths ($S_{g\,HT}$, $S_{g\,NT}$) indicated in the table.

GENERAL PRINCIPLES

- Characteristic values comply with the EN 1995:2014 standard in accordance with ETA-12/0471.
- For the calculation process a timber characteristic density ρ_k = 385 kg/m^3 has been considered.
- During calculation, an effective thread length equal to S_g = (L - 10 mm - 10 mm - Tol.) /2 with Tol. = installation tolerance 10 mm is considered.
- The thread axial resistance to withdrawal has been evaluated considering an effective thread length equal to S_g. The connectors must be inserted at 45° with respect to the shear plane.
- Dimensioning and verification of the timber elements must be carried out separately.
- For different calculation methods, the GWZ calculator spreadsheet is available (www.holztechnic.com).

STRUCTURAL VALUES



		TENSION(1)							
geometry		total thread withdrawal(2)			partial thread withdrawal(2)			steel tension	
				timber			timber	steel	
d_1 [mm]	L [mm]	b [mm]	A_{MIN} [mm]	$R_{ax,k}$ [kN]	S_g [mm]	A_{MIN} [mm]	$R_{ax,k}$ [kN]	$R_{tens,k}$ [kN]	
6	100	90	110	6,41	35	55	2,49	12,00	
	120	110	130	7,84	45	65	3,21		
	140	130	150	9,26	55	75	3,92		
	160	150	170	10,68	65	85	4,63		
	180	170	190	12,11	75	95	5,34		
	200	190	210	13,53	85	105	6,05		
	220	210	230	14,96	95	115	6,77		
8	120	110	130	10,45	45	65	4,27	21,00	
	140	130	150	12,35	55	75	5,22		
	160	150	170	14,25	65	85	6,17		
	180	170	190	16,15	75	95	7,12		
	200	190	210	18,04	85	105	8,07		
	220	210	230	19,94	95	115	9,02		
	240	230	250	21,84	105	125	9,97		
	260	250	270	23,74	115	135	10,92		
	280	270	290	25,64	125	145	11,87		
	300	290	310	27,54	135	155	12,82		
	320	310	330	29,44	145	165	13,77		
	340	330	350	31,34	155	175	14,72		
	360	350	370	33,24	165	185	15,67		
	380	370	390	35,14	175	195	16,62		
	400	390	410	37,04	185	205	17,57		

NOTES

(1) The connector design resistance is the lowest between the timber side design resistance ($R_{ax,d}$) and the steel side resistance ($R_{tens,d}$).

$$R_{ax,d} = min \begin{cases} \dfrac{R_{ax,k} \cdot k_{mod}}{\gamma_M} \\ \dfrac{R_{tens,k}}{\gamma_{M2}} \end{cases}$$

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

(2) The axial resistance of the thread to withdrawal was calculated considering a 90° angle between the fibres and the connector and for an effective thread length of b or S_g. For intermediate values of S_g it is possible to linearly interpolate.

GENERAL PRINCIPLES

- Characteristic values comply with the EN 1995:2014 standard in accordance with ETA-12/0471.
- For the calculation process a timber characteristic density ρ_k = 385 kg/m^3 has been considered.
- Dimensioning and verification of the timber elements must be carried out separately.