TBS SOFTWOOD

FLANGE HEAD SCREW

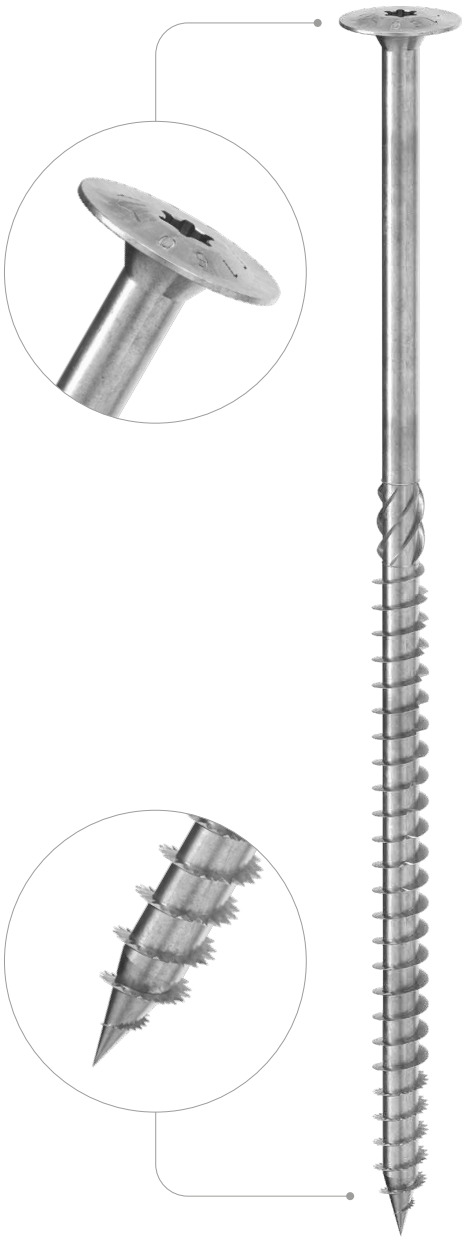
CE
EN 14592

SAW TIP
Special self-perforating tip with serrated thread (SAW tip) that cuts the timber grains, facilitating initial grip and subsequent pull-through.

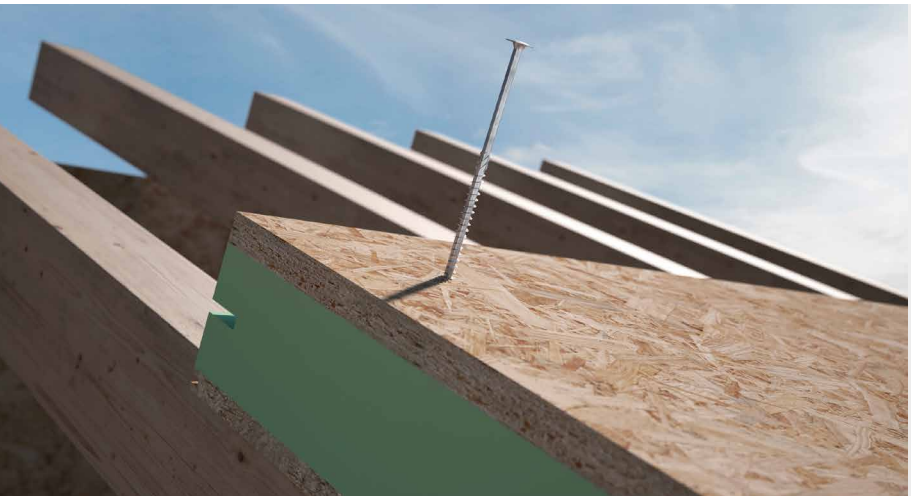
INTEGRATED WASHER
The flange head serves as washer and ensures high head strength and pull-through. Ideal in the presence of wind or variations in timber dimensions.

LONGER THREAD
Greater thread length (60%) to ensure superb joint closure and great versatility.

SOFTWOOD
Optimised geometry for maximum performance on the most common construction timbers.



DIAMETER [mm]	6 (6 – 8) 16
LENGTH [mm]	40 (80 – 400) 1000
SERVICE CLASS	SC1 SC2
ATMOSPHERIC CORROSIVITY	C1 C2
WOOD CORROSIVITY	T1 T2
MATERIAL	Zn ELECTRO PLATED electrogalvanized carbon steel



FIELDS OF USE

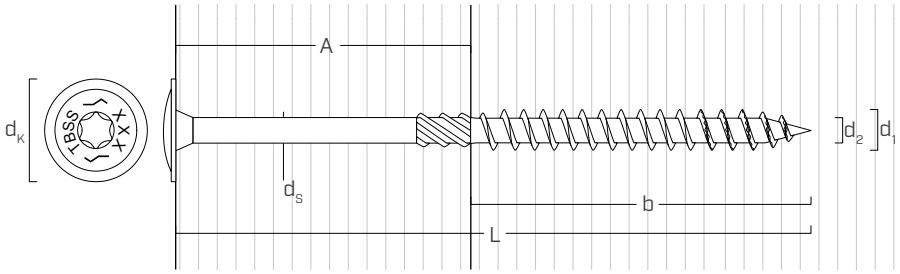
- timber based panels
- fibreboard and MDF panels
- solid timber
- glulam (Glued Laminated Timber)
- CLT and LVL

CODES AND DIMENSIONS

d_1 [mm]	d_K [mm]	CODE	L [mm]	b [mm]	A [mm]	pcs
6 TX 30	15,5	TBSS680	80	50	30	100
		TBSS6100	100	60	40	100
		TBSS6120	120	75	45	100
		TBSS6140	140	80	60	100
		TBSS6160	160	90	70	100

d_1 [mm]	d_K [mm]	CODE	L [mm]	b [mm]	A [mm]	pcs
8 TX 40	19,0	TBSS8180	180	100	80	50
		TBSS8200	200	100	100	50
		TBSS8220	220	100	120	50
		TBSS8240	240	100	140	50
		TBSS8260	260	100	160	50
		TBSS8280	280	100	180	50
		TBSS8300	300	100	200	50
		TBSS8320	320	120	200	50
		TBSS8340	340	120	220	50
		TBSS8360	360	120	240	50
		TBSS8380	380	120	260	50
		TBSS8400	400	120	280	50

GEOMETRY AND MECHANICAL CHARACTERISTICS



GEOMETRY

Nominal diameter	d_1	[mm]	6	8
Head diameter	d_K	[mm]	15,50	19,00
Thread diameter	d_2	[mm]	3,95	5,40
Shank diameter	d_S	[mm]	4,30	5,80
Pre-drilling hole diameter (softwood)(1)	d_V	[mm]	4,0	5,0

(1) For high density materials, pre-drilled holes are recommended based on the wood specie.

CHARACTERISTIC MECHANICAL PARAMETERS

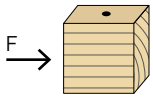
Nominal diameter	d_1	[mm]	6	8
Tensile strength	$f_{tens,k}$	[kN]	12,0	19,0
Yield moment	$M_{y,k}$	[Nm]	9,5	18,5
Withdrawal resistance parameter	$f_{ax,k}$	[N/mm^2]	12,0	12,0
Associated density	ρ_a	[kg/m^3]	350	350
Head-pull-through parameter	$f_{head,k}$	[N/mm^2]	13,0	13,0
Associated density	ρ_a	[kg/m^3]	350	350

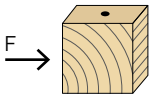
TIMBER FRAME & SIP PANELS

Range of sizes designed for fastening applications of medium to large structural elements such as lightweight boards and frames up to SIP and Sandwich type panels.

MINIMUM DISTANCES FOR SHEAR LOADS

screws inserted **WITHOUT pre-drilled hole** — $\rho_k \leq 420$ kg/m³

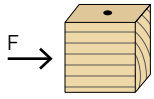


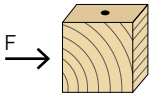


d_1	[mm]		6	8
a_1	[mm]	**12·d**	72	96
a_2	[mm]	**5·d**	30	40
$a_{3,t}$	[mm]	**15·d**	90	120
$a_{3,c}$	[mm]	**10·d**	60	80
$a_{4,t}$	[mm]	**5·d**	30	40
$a_{4,c}$	[mm]	**5·d**	30	40

d_1	[mm]		6	8
a_1	[mm]	**5·d**	30	40
a_2	[mm]	**5·d**	30	40
$a_{3,t}$	[mm]	**10·d**	60	80
$a_{3,c}$	[mm]	**10·d**	60	80
$a_{4,t}$	[mm]	**10·d**	60	80
$a_{4,c}$	[mm]	**5·d**	30	40

screws inserted **WITH pre-drilled hole**

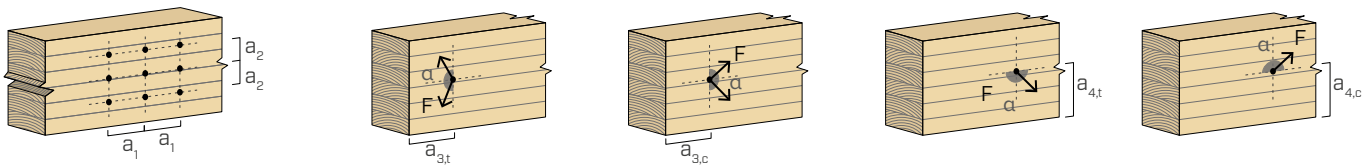




d_1	[mm]		6	8
a_1	[mm]	**5·d**	30	40
a_2	[mm]	**3·d**	18	24
$a_{3,t}$	[mm]	**12·d**	72	96
$a_{3,c}$	[mm]	**7·d**	42	56
$a_{4,t}$	[mm]	**3·d**	18	24
$a_{4,c}$	[mm]	**3·d**	18	24

d_1	[mm]		6	8
a_1	[mm]	**4·d**	24	32
a_2	[mm]	**4·d**	24	32
$a_{3,t}$	[mm]	**7·d**	42	56
$a_{3,c}$	[mm]	**7·d**	42	56
$a_{4,t}$	[mm]	**7·d**	42	56
$a_{4,c}$	[mm]	**3·d**	18	24

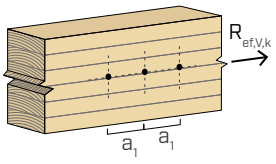
α = load-to-grain angle
d = d_1 = nominal screw diameter



NOTE on page 91.

EFFECTIVE NUMBER FOR SHEAR LOADS

The load-bearing capacity of a connection made with several screws, all of the same type and size, may be lower than the sum of the load-bearing capacities of the individual connection system.
For a row of n screws arranged parallel to the direction of the grain at a distance a_1, the characteristic effective load-bearing capacity is equal to:



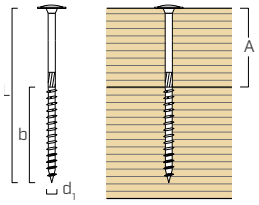
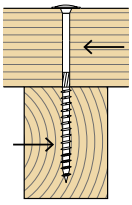
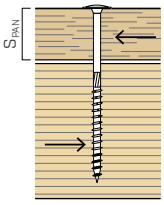
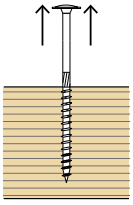
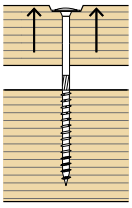
$$R_{ef,V,k} = n_{ef} \cdot R_{V,k}$$

The n_{ef} value is given in the table below as a function of n and a_1.

		a_1(*) 4·d	5·d	6·d	7·d	8·d	9·d	10·d	11·d	12·d	13·d	≥ 14·d
n	2	1,41	1,48	1,55	1,62	1,68	1,74	1,80	1,85	1,90	1,95	2,00
	3	1,73	1,86	2,01	2,16	2,28	2,41	2,54	2,65	2,76	2,88	3,00
	4	2,00	2,19	2,41	2,64	2,83	3,03	3,25	3,42	3,61	3,80	4,00
	5	2,24	2,49	2,77	3,09	3,34	3,62	3,93	4,17	4,43	4,71	5,00

(*)For intermediate a_1 values a linear interpolation is possible.

STRUCTURAL VALUES

				SHEAR			TENSION	
geometry				timber-to-timber ε=90°	panel-to-timber		thread withdrawal	head pull-through
								
d_1 [mm]	L [mm]	b [mm]	A [mm]	$R_{V,90,k}$ [kN]	S_{PAN} [mm]	$R_{V,k}$ [kN]	$R_{ax,90,k}$ [kN]	$R_{head,k}$ [kN]
6	80	50	30	2,07	50	1,92	3,89	3,37
	100	60	40	2,31		2,64	4,66	3,37
	120	75	45	2,33		2,70	5,83	3,37
	140	80	60	2,33		2,70	6,22	3,37
	160	90	70	2,33		2,70	6,99	3,37
8	180	100	80	3,57	65	4,10	10,36	5,06
	200	100	100	3,57		4,10	10,36	5,06
	220	100	120	3,57		4,10	10,36	5,06
	240	100	140	3,57		4,10	10,36	5,06
	260	100	160	3,57		4,10	10,36	5,06
	280	100	180	3,57		4,10	10,36	5,06
	300	100	200	3,57		4,10	10,36	5,06
	320	120	200	3,57		4,10	12,43	5,06
	340	120	220	3,57		4,10	12,43	5,06
	360	120	240	3,57		4,10	12,43	5,06
	380	120	260	3,57		4,10	12,43	5,06
	400	120	280	3,57		4,10	12,43	5,06

STRUCTURAL VALUES

GENERAL PRINCIPLES

- Characteristic values according to EN 1995:2014.
- Design values can be obtained from characteristic values as follows:

$$R_d = \frac{R_k \cdot k_{mod}}{\gamma_M}$$

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

- Mechanical strength values and screw geometry comply with CE marking according to EN 14592.
- Sizing and verification of the timber elements, panels and metal plates must be done separately.
- The characteristic shear resistances are calculated for screws inserted without pre-drilling hole. In the case of screws inserted with pre-drilling hole, greater resistance values can be obtained.
- The values in the table are independent of the load-to-grain angle.
- The screws must be positioned in accordance with the minimum distances.
- The characteristic panel-timber shear strengths are calculated considering an OSB3 or OSB4 panel, as per EN 300, or a particle board panel, as per EN 312, with thickness S_{PAN}.
- The thread withdrawal characteristic strength has been evaluated considering a fixing length equal to b.
- The head pull-through characteristic strength was calculated using timber elements.

NOTES

- The characteristic timber-to-timber shear strengths were evaluated by considering an angle ε of 90° between the grains of the second element and the connector.
- The characteristic panel-timber shear strengths were evaluated considering an angle ε of 90° between the grains of the timber element and the connector.
- The characteristic thread withdrawal strength was evaluated by considering a 90° angle ε between the fibers of the timber element and the connector.
- For the calculation process a timber characteristic density ρ_k = 385 kg/m^3 has been considered.
  For different values of ρ_k, the strength values in the table (timber-to-timber shear, steel-to-timber shear and tensile) can be converted by means of the coefficient k_{dens}.

$$R'_{V,k} = k_{dens,v} \cdot R_{V,k}$$
$$R'_{ax,k} = k_{dens,ax} \cdot R_{ax,k}$$
$$R'_{head,k} = k_{dens,ax} \cdot R_{head,k}$$

ρ_k [kg/m^3]	350	380	**385**	405	425	430	440
C-GL	*C24*	*C30*	*GL24h*	*GL26h*	*GL28h*	*GL30h*	*GL32h*
$k_{dens,v}$	0,90	0,98	1,00	1,02	1,05	1,05	1,07
$k_{dens,ax}$	0,92	0,98	1,00	1,04	1,08	1,09	1,11

Strength values thus determined may differ, for higher safety standards, from those resulting from an exact calculation.

MINIMUM DISTANCES

NOTES

- Minimum distances in accordance with EN 1995:2014.
- The minimum spacing for all panel-to-timber connections (a_1, a_2) can be multiplied by a coefficient of 0,85.