LBS

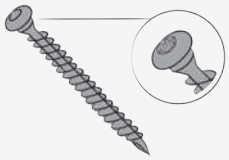
CE
ETA 11/0030

Round-head screw with cylindrical under head

Carbon steel with white galvanic zinc coating

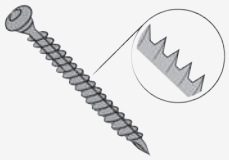
SPECIAL HEAD

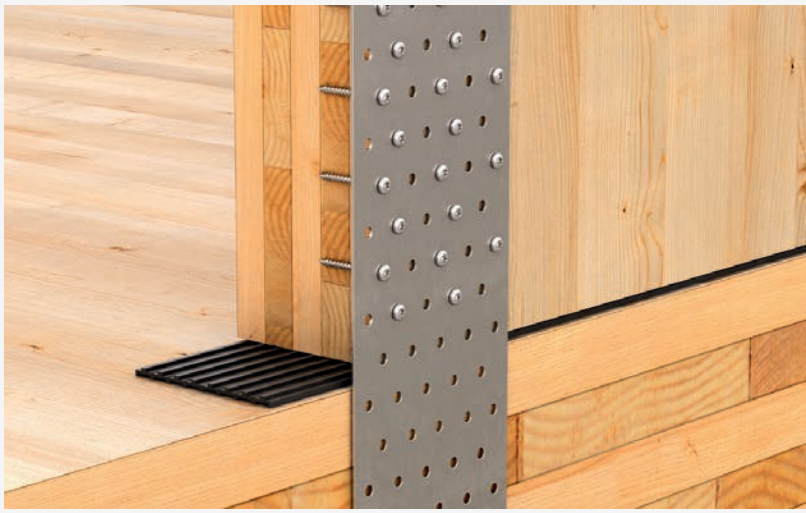
Round head with cylindrical under head, ideal for fastening metal elements



TOTAL THREAD

The total thread allows for versatile and effective fastening





AESTHETICS

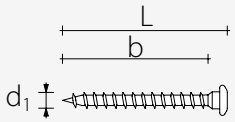
The rounded head provides visible fastenings that are pleasing to the eye, both on metal plates and directly on wood

METAL PLATES

The geometry of the head was carefully designed for fastening to metal plates and corners. The cylindrical under head creates an interlocking effect that improves the static performance of the joint

Codes and dimensions

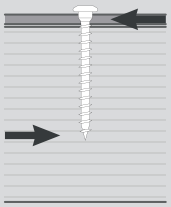
d_1 [mm]	code	L [mm]	b [mm]	pcs/pckg
5 *TX20*	**PF603525**	25	21	500
	PF603540	40	36	
	PF603550	50	46	200
	PF603560	60	56	
	PF603570	70	66	



Carpenter statics

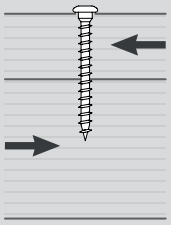
ALLOWABLE VALUES
DIN 1052:1988

SHEAR V_{adm}



STEEL-WOOD

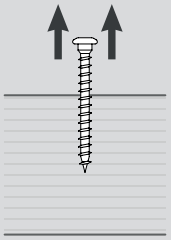
d_1 [mm]	L [mm]	V_{adm}
5	≥ 25	53 kg



WOOD-WOOD [(1)]

d_1 [mm]	L [mm]	V_{adm}
5	≥ 60	40 kg

THREAD WITHDRAWAL N_{adm}



	Length L [mm]				
d_1 [mm]	**25**	**40**	**50**	**60**	**70**
5	53 kg	90 kg	115 kg	140 kg	165 kg

CALCULATION FORMULAS - SHEAR DIN 1052-2:1988

WOOD-WOOD

$V_{adm} = \min \{ 0,4 \cdot A \cdot d_1 ; 1,7 \cdot d_1^{\,2} \}$

d_1 [mm]
A [mm]
V_{adm} [kg]

STEEL-WOOD

$V_{adm} = 1,25 \cdot 1,7 \cdot d_1^{\,2}$

d_1 [mm]
V_{adm} [kg]

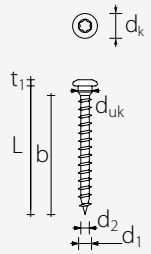
NOTE

- Allowable values in accordance with DIN 1052:1988.
- The allowable extraction values are calculated considering the threaded part as being completely inserted into the wood.

[(1)] The allowable wood-wood shear resistance values were calculated on the basis of an fastenable thickness of 20 mm.

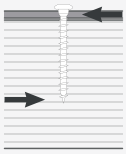
Geometry and minimum distances

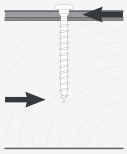
GEOMETRY AND MECHANICAL CHARACTERISTICS



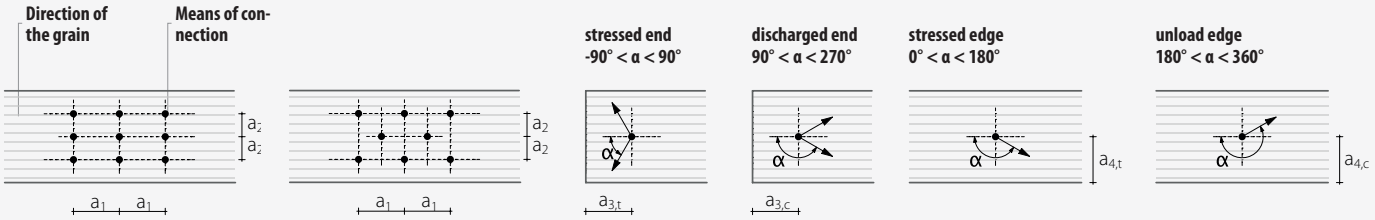
LBS SCREWS		
Nominal diameter	**d_1** [mm]	**5**
Head diameter	d_K [mm]	7,80
Tip diameter	d_2 [mm]	3,00
Underhead diameter	d_{UK} [mm]	4,90
Head thickness	t_1 [mm]	2,40
Pre-bored hole diameter	d_V [mm]	3,0
Characteristic yield moment	$M_{y,k}$ [Nmm]	5417,2
Characteristic extraction-resistance parameter	$f_{ax,k}$ [N/mm²]	11,7
Characteristic head-penetration parameter	$f_{head,k}$ [N/mm²]	10,5
Characteristic tensile strength	$f_{tens,k}$ [kN]	7,9

MINIMUM DISTANCES FOR SHEAR LOADS STEEL-WOOD





		Angle between strength and grain α = 0°	Angle between strength and grain α = 90°
SCREWS INSERTED WITH PRE-BORED HOLES			
		5	**5**
a_1	[mm]	18	14
a_2	[mm]	11	14
$a_{3,t}$	[mm]	60	35
$a_{3,c}$	[mm]	35	35
$a_{4,t}$	[mm]	15	35
$a_{4,c}$	[mm]	15	15
SCREWS INSERTED WITHOUT PRE-BORED HOLES			
		5	**5**
a_1	[mm]	42	18
a_2	[mm]	18	18
$a_{3,t}$	[mm]	75	50
$a_{3,c}$	[mm]	50	50
$a_{4,t}$	[mm]	25	50
$a_{4,c}$	[mm]	25	25

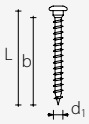
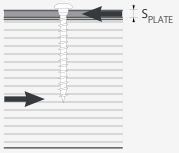


NOTE

- The minimum distances are in accordance with EN 1995:2008, according to ETA-11/0030, considering a mass density of the wood elements of $\rho_k \leq 420$ kg/m³.
- In the case of wood-wood joints, the minimum spacings (a_1, a_2) must be multiplied by a coefficient of 1.5.

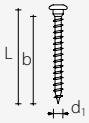
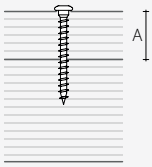
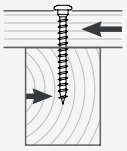
Designer statics

SHEAR STEEL - WOOD [1]

geometry									
									
d_1 [mm]	L [mm]	b [mm]	$R_{V,k}$ [kN] $S_{PLATE} = 1,5$ mm	$S_{PLATE} = 2$ mm	$S_{PLATE} = 2,5$ mm	$S_{PLATE} = 3$ mm	$S_{PLATE} = 4$ mm	$S_{PLATE} = 5$ mm	$S_{PLATE} = 6$ mm
5	25	21	0,90	0,88	0,87	0,98	1,23	1,47	1,43
	40	36	1,48	1,46	1,44	1,58	1,88	2,15	2,11
	50	46	1,86	1,85	1,83	1,92	2,12	2,35	2,35
	60	56	2,05	2,05	2,05	2,15	2,34	2,52	2,50
	70	66	2,20	2,20	2,20	2,30	2,50	2,68	2,66

SHEAR WOOD - WOOD

TRACTION

geometry					thread withdrawal [2]
					
d_1 [mm]	L [mm]	b [mm]	A [mm]	$R_{V,k}$ [kN]	$R_{ax,k}$ [kN]
5	25	21	-	-	1,31
	40	36	15	1,00	2,25
	50	46	20	1,10	2,87
	60	56	25	1,23	3,50
	70	66	30	1,34	4,12

GENERAL PRINCIPLES

- Characteristic values comply with the EN 1995:2008 standard in accordance with ETA-11/0030.
- Design values are obtained from the following characteristic values:

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

The coefficients γ_m and k_{mod} should be taken according to the current regulations used for the calculation.
- For the mechanical resistance values and the geometry of the screws, reference was made to ETA-11/0030.
- In the calculations, the density of the wood elements was considered equal to $\rho_k = 380$ kg/m³.
- Sizing and verification of the wooden elements and steel plates must be done separately.
- The shear characteristic resistances are calculated for screws inserted without pre-bored holes. In the case of screws inserted with pre-bored holes, greater resistance values can be obtained.

NOTE

[1] The shear characteristic resistances are calculated for plates with thickness = S_{PLATE}, considering the case of a thin plate ($S_{PLATE} \leq 0,5\ d_1$), intermediate plate ($0,5\ d_1 < S_{PLATE} < d_1$) or thick ($S_{PLATE} \geq d_1$) .

[2] The axial thread-extraction resistance was calculated considering a 90° angle between the grain and the connector and for a fixing length of b.