

TBS EVO

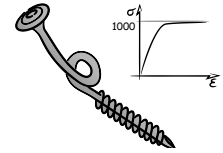
Large head screw

Carbon steel with organic anti-rust coating in an epoxy resin base



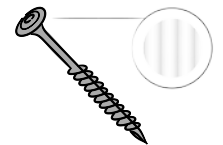
SPECIAL STEEL

Highly ductile (moves with the wood) and resistant steel ($f_{y,k} = 1000 \text{ N/mm}^2$).



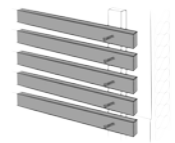
EVO C4 COATING

Nanocoating surface treatment with high corrosion resistance, class C4.

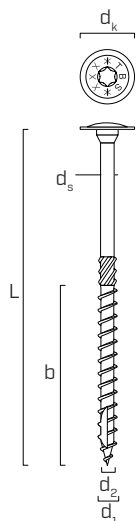


FIELDS OF USE

Exterior use; appropriate for service classes 1-2-3.



GEOMETRY AND MECHANICAL CHARACTERISTICS



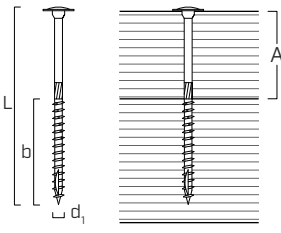
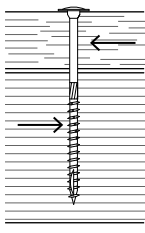
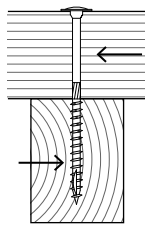
TBS EVO SCREW				
Nominal diameter	d_1	[mm] [inch]	6 1/4 "	8 5/16 "
Head diameter	d_k	[mm] [inch]	15.50 0.610	19.00 0.748
Tip diameter	d_2	[mm] [inch]	3.95 0.156	5.40 0.213
Shank diameter	d_s	[mm] [inch]	4.30 0.169	5.80 0.228
Pre-drilling diameter	d_v	[mm] [inch]	4.00 0.157	5.00 0.197
Bending strength	F_{yb}	[N/mm²] [psi]	1000 145038	1000 145038
Characteristic tensile strength	$f_{tens,k}$	[kN] [lbf]	11.3 2.540	20.1 4.519

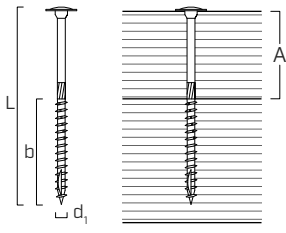
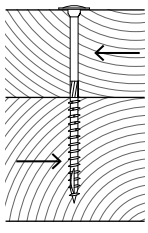
PRODUCT CODES AND PIECES PER PACKAGE

d ₁	Length L	CODE	pcs
[mm] [inch]	[mm]		
6 1/4"	60	TBSEV0660	100
	80	TBSEV0680	100
	100	TBSEV06100	100
	120	TBSEV06120	100
	140	TBSEV06140	100
	160	TBSEV06160	100
8 5/16"	100	TBSEV08100	50
	120	TBSEV08120	50
	140	TBSEV08140	50
	160	TBSEV08160	50
	180	TBSEV08180	50
	200	TBSEV08200	50
	220	TBSEV08220	50
	240	TBSEV08240	50

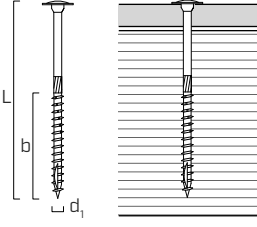
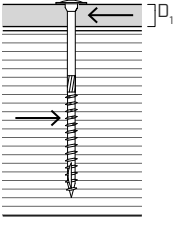
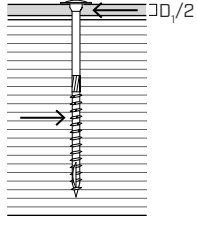


STATIC VALUES: SHEAR WOOD-WOOD

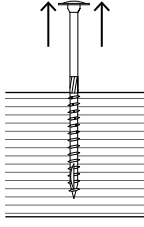
GEOMETRY							WOOD-WOOD Z//				WOOD-WOOD Z _{mL}			
														
							REFERENCE LATERAL DESIGN VALUE (Z) FOR:				REFERENCE LATERAL DESIGN VALUE (Z) FOR:			
d ₁	Length L		Thread length b		Side member A		G=0.35 Z//	G=0.42 Z//	G=0.50 Z//	G=0.55 Z//	G=0.33 Z _{mL}	G=0.42 Z _{mL}	G=0.50 Z _{mL}	G=0.55 Z _{mL}
[mm] [inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]
6 1/4"	60	2 3/8"	40	1 5/8"	20	0.787	99	124	152	171	99	124	152	171
	80	3 1/8"	50	2"	30	1.181	113	143	182	210	113	143	182	210
	100	4"	60	2 3/8"	40	1.575	128	166	195	213	128	166	195	213
	120	4 3/4"	75	2 3/4"	45	1.772	138	166	195	213	138	166	195	213
	140	5 1/2"	75	2 3/4"	65	2.559	140	166	195	213	140	166	195	213
	160	6 1/4"	75	2 3/4"	85	3.346	140	166	195	213	140	166	195	213
8 5/16"	100	4"	52	2"	48	1.890	254	283	308	323	150	181	218	239
	120	4 3/4"	80	3 1/8"	40	1.575	229	264	303	323	140	166	197	217
	140	5 1/2"	80	3 1/8"	60	2.362	258	283	308	323	169	201	225	239
	160	6 1/4"	100	4"	60	2.362	258	283	308	323	169	201	225	239
	180	7 1/8"	100	4"	80	3.150	258	283	308	323	179	201	225	239
	200	7 7/8"	100	4"	100	3.937	258	283	308	323	179	201	225	239
	220	8 5/8"	100	4"	120	4.724	258	283	308	323	179	201	225	239
	240	9 1/2"	100	4"	140	5.512	258	283	308	323	179	201	225	239

GEOMETRY							WOOD-WOOD $Z_{\perp}$			
										
							REFERENCE LATERAL DESIGN VALUE (Z) FOR:			
d_1	Length L		Thread length b		Side member A		G=0.35 $Z_{\perp}$	G=0.42 $Z_{\perp}$	G=0.50 $Z_{\perp}$	G=0.55 $Z_{\perp}$
$\frac{[mm]}{[inch]}$	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[lbf]	[lbf]	[lbf]	[lbf]
6 $\frac{1}{4}$ "	60	2 3/8"	40	1 5/8"	20	0.787	99	124	152	171
	80	3 1/8"	50	2"	30	1.181	113	143	182	210
	100	4"	60	2 3/8"	40	1.575	128	166	195	213
	120	4 3/4"	75	2 3/4"	45	1.772	138	166	195	213
	140	5 1/2"	75	2 3/4"	65	2.559	140	166	195	213
	160	6 1/4"	75	2 3/4"	85	3.346	140	166	195	213
8 $\frac{5}{16}$ "	100	4"	52	2"	48	1.890	127	166	206	223
	120	4 3/4"	80	3 1/8"	40	1.575	128	154	185	206
	140	5 1/2"	80	3 1/8"	60	2.362	155	183	208	223
	160	6 1/4"	100	4"	60	2.362	155	183	208	223
	180	7 1/8"	100	4"	80	3.150	160	183	208	223
	200	7 7/8"	100	4"	100	3.937	160	183	208	223
	220	8 5/8"	100	4"	120	4.724	160	183	208	223
	240	9 1/2"	100	4"	140	5.512	160	183	208	223

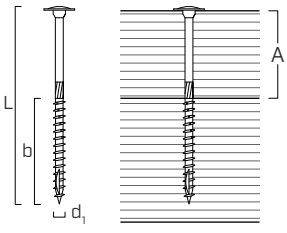
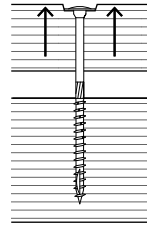
STATIC VALUES: SHEAR WOOD-STEEL

GEOMETRY							WOOD-STEEL (thickness= D_t) $Z_{ }$				WOOD-STEEL (thickness= $D_t/2$) $Z_{ }$			
														
							REFERENCE LATERAL DESIGN VALUE (Z) FOR:				REFERENCE LATERAL DESIGN VALUE (Z) FOR:			
d_1	Length L		Thread length b		Side member A		$G=0.35$ $Z_{ }$	$G=0.42$ $Z_{ }$	$G=0.50$ $Z_{ }$	$G=0.55$ $Z_{ }$	$G=0.35$ $Z_{ }$	$G=0.42$ $Z_{ }$	$G=0.50$ $Z_{ }$	$G=0.55$ $Z_{ }$
[mm] [inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]
6 1/4"	60	2 3/8"	40	1 5/8"	20	0.787	196	231	269	292	157	183	211	228
	80	3 1/8"	50	2"	30	1.181	196	231	269	292	157	183	211	228
	100	4"	60	2 3/8"	40	1.575	196	231	269	292	157	183	211	228
	120	4 3/4"	75	2 3/4"	45	1.772	196	231	269	292	157	183	211	228
	140	5 1/2"	75	2 3/4"	65	2.559	196	231	269	292	157	183	211	228
	160	6 1/4"	75	2 3/4"	85	3.346	196	231	269	292	157	183	211	228
8 5/16"	100	4"	52	2"	48	1.890	357	389	423	442	281	305	329	343
	120	4 3/4"	80	3 1/8"	40	1.575	357	389	423	442	281	305	329	343
	140	5 1/2"	80	3 1/8"	60	2.362	357	389	423	442	281	305	329	343
	160	6 1/4"	100	4"	60	2.362	357	389	423	442	281	305	329	343
	180	7 1/8"	100	4"	80	3.150	357	389	423	442	281	305	329	343
	200	7 7/8"	100	4"	100	3.937	357	389	423	442	281	305	329	343
	220	8 5/8"	100	4"	120	4.724	357	389	423	442	281	305	329	343
	240	9 1/2"	100	4"	140	5.512	357	389	423	442	281	305	329	343

STATIC VALUES: TRACTION THREAD WITHDRAWAL

WITHDRAWAL				
				
d_1	$G=0.33$ W	$G=0.42$ W	$G=0.50$ W	$G=0.55$ W
[mm] [inch]	[lbs/in]	[lbs/in]	[lbs/in]	[lbs/in]
6 1/4"	126	166	216	249
8 5/16"	157	206	268	309

STATIC VALUES: TRACTION HEAD PENETRATION

GEOMETRY							HEAD-PULL THROUGH W_H			
										
d_1	Length L		Head Diameter (d_k)		Side Member Thickness A		$G=0.35$ W_H	$G=0.42$ W_H	$G=0.50$ W_H	$G=0.55$ W_H
	[mm] [inch]	[mm] [inch]	[mm] [inch]	[mm] [inch]	[mm] [inch]	[mm] [inch]	[lbs]	[lbs]	[lbs]	[lbs]
6 1/4"	60	2 3/8"	16	0.610	20	13/16"	128	184	260	315
	80	3 1/8"	16	0.610	30	1 1/8"	191	275	390	472
	100	4"	16	0.610	40	1 5/8"	247	356	504	610
	120	4 3/4"	16	0.610	45	1 5/8"	247	356	504	610
	140	5 1/2"	16	0.610	65	2 3/8"	247	356	504	610
	160	6 1/4"	16	0.610	85	3 1/8"	247	356	504	610
8 5/16"	100	4"	19	0.748	48	1 5/8"	371	535	758	917
	120	4 3/4"	19	0.748	40	1 5/8"	313	450	638	772
	140	5 1/2"	19	0.748	60	2 3/8"	371	535	758	917
	160	6 1/4"	19	0.748	60	2 3/8"	371	535	758	917
	180	7 1/8"	19	0.748	80	3 1/8"	371	535	758	917
	200	7 7/8"	19	0.748	100	4"	371	535	758	917
	220	8 5/8"	19	0.748	120	4 3/4"	371	535	758	917
	240	9 1/2"	19	0.748	140	5 1/2"	371	535	758	917

NOTES

- Values based on the "Technical Design Guide USA", download from www.rothoblaas.com
- Values were calculated considering the threaded part as being completely inserted into the wood
- Reference lateral design values (Z) are based on NDS 2018. Characteristic values of mechanical properties and geometries are in accordance with ETA-11/0030
- Reference lateral design values (W) are based on NDS 2018. Characteristic values of mechanical properties and geometries are in accordance with ETA-11/0030
- The axial thread-extraction resistance was calculated considering a 90° angle between the grain and the connector and for a fixing length of b
- The shear characteristic resistances are calculated considering the case of a thick plate ($S_{PLATE} \geq d_1$)
- The shear characteristic resistances are calculated considering the case of a thin plate ($S_{PLATE} \leq 0.5 d_1$)
- Reference lateral design values (W_H) are based on NDS 2018. Characteristic values of mechanical properties and geometries are in accordance with ETA-11/0030
- The axial resistance to head penetration was calculated using wood elements. In the case of steel-wood connections, generally the steel tensile strength is binding with respect to head separation or penetration
- Download the latest version of this document from www.rothoblaas.com

GENERAL PRINCIPLES

- The reference resistance values for connections shall be multiplied by all applicable adjustment factors (ref. NDS Table 11.3.1)
- Sizing and verification of the wooden elements, panels and steel plates must be done separately
- For different calculation methods, the My Project software is available free of charge (www.rothoblaas.com)
- The characteristic resistances were calculated using solid wood or glulam. In the case of joints with CLT elements, the resistance values may be different and should be calculated taking into account the characteristics of the panel and the connection configuration
- ASTM A36 steel side plates. Bearing strength $F_e=87.000$ [psi]