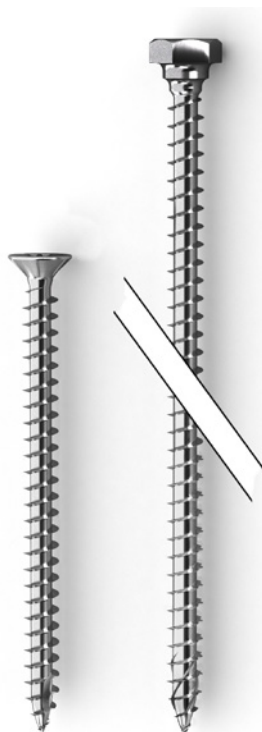


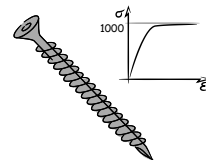
Fully threaded connector with countersunk or hexagonal head

Galvanized carbon steel



SPECIAL STEEL

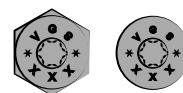
Highly ductile (moves with the wood) and resistant steel ($f_{y,k} = 1000 \text{ N/mm}^2$).



COUNTERSUNK OR HEXAGONAL HEAD

Countersunk head up to $L = 600 \text{ mm}$, ideal for use on plates or for concealed reinforcements.

Hexagonal head $L > 600 \text{ mm}$ to facilitate gripping with screwdriver.

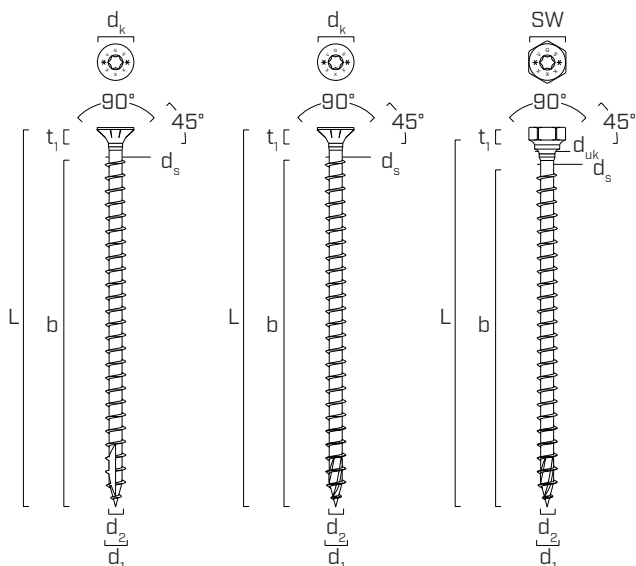


GEOMETRY AND MECHANICAL CHARACTERISTICS

VGS 9 - 11

VGS 13 ($L \leq 600 \text{ mm}$)

VGS 13 ($L > 600 \text{ mm}$)



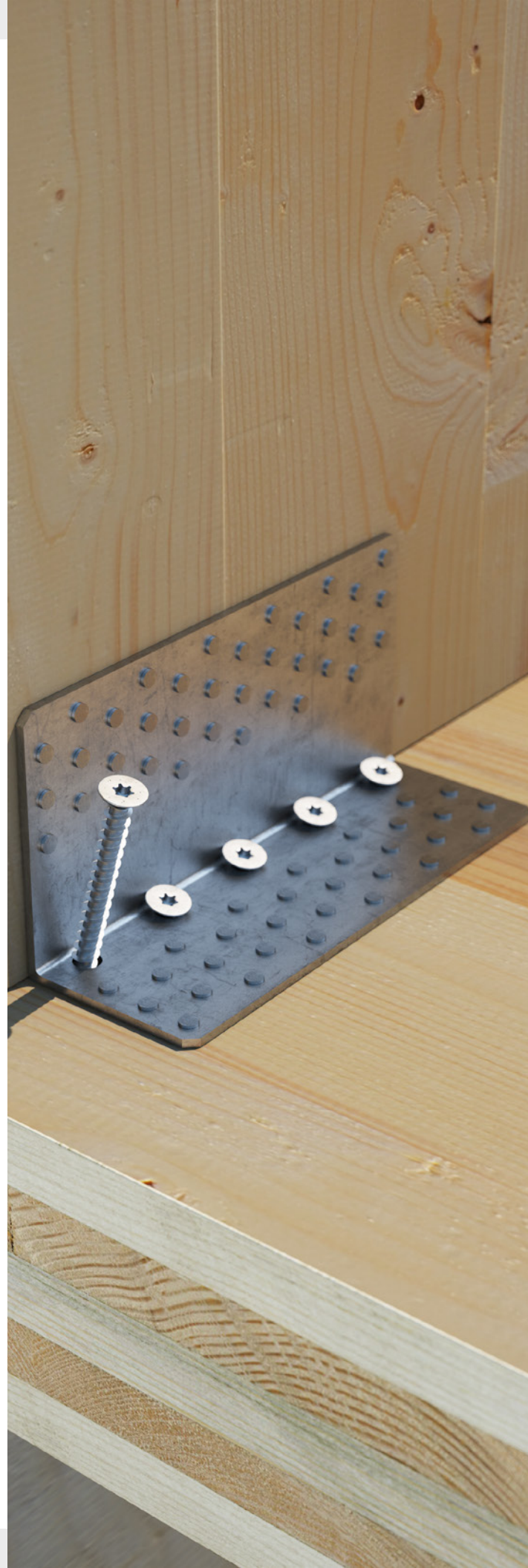
VGS SCREW

			9	11	13 ($L \leq 600 \text{ mm}$)	13 ($L > 600 \text{ mm}$)
Nominal diameter	d_1	[mm] [inch]	9 11/32"	11 7/16"	13 ($L \leq 600 \text{ mm}$) 9/16"	13 ($L > 600 \text{ mm}$) 9/16"
Head diameter	d_k	[mm] [inch]	16.00 0.630	19.30 0.760	22.00 0.866	SW 19.00 SW 0.748
Underhead diameter	d_{uk}	[mm] [inch]	-- --	-- --	-- --	14.8 0.583
Tip diameter	d_2	[mm] [inch]	5.90 0.232	6.60 0.260	8.00 0.315	8.00 0.315
Shank diameter	d_s	[mm] [inch]	6.50 0.256	7.70 0.303	8.00 0.315	8.00 0.315
Head thickness	t_1	[mm] [inch]	6.50 0.256	8.20 0.323	9.40 0.370	7.50 0.295
Pre-drilling diameter	d_v	[mm] [inch]	5.00 0.197	6.00 0.236	7.00 0.276	7.00 0.276
Bending strength	F_{yb}	[N/mm²] [psi]	1000 145038	1000 145038	1000 145038	1000 145038
Characteristic tensile strength	$f_{tens,k}$	[kN] [lbf]	20.1 4.519	31.4 7.059	33.9 7.621	33.9 7.621

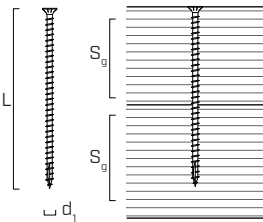
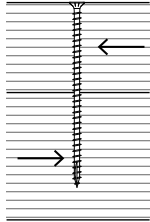
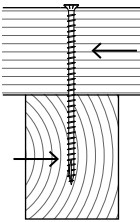
PRODUCT CODES AND PIECES PER PACKAGE

d ₁	Length L	CODE	pcs
[mm] [inch]	[mm]		
9 11/32"	120	VGS9120	25
	140	VGS9140	25
	160	VGS9160	25
	180	VGS9180	25
	200	VGS9200	25
	220	VGS9220	25
	240	VGS9240	25
	260	VGS9260	25
	280	VGS9280	25
	300	VGS9300	25
	320	VGS9320	25
	340	VGS9340	25
	360	VGS9360	25
	380	VGS9380	25
	400	VGS9400	25
	440	VGS9440	25
	480	VGS9480	25
	520	VGS9520	25

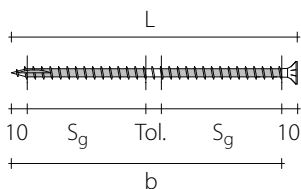
d ₁	Length L	CODE	pcs
[mm] [inch]	[mm]		
11 7/16"	100	VGS11100	25
	125	VGS11125	25
	150	VGS11150	25
	175	VGS11175	25
	200	VGS11200	25
	225	VGS11225	25
	250	VGS11250	25
	275	VGS11275	25
	300	VGS11300	25
	325	VGS11325	25
	350	VGS11350	25
	375	VGS11375	25
	400	VGS11400	25
	450	VGS11450	25
	500	VGS11500	25
	550	VGS11550	25
13 9/16"	600	VGS11600	25
	700	VGS11700	25
	800	VGS11800	25
	100	VGS13100 (NO RIBS)	25
	200	VGS13200 (NO RIBS)	25
	300	VGS13300	25
	400	VGS13400	25
	500	VGS13500	25
	600	VGS13600	25
	700	VGS13700	25
	800	VGS13800	25
	900	VGS13900	25
	1000	VGS131000	25
	1100	VGS131100	25
	1200	VGS131200	25



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		S _g		G=0.35 Z//	G=0.42 Z//	G=0.50 Z//	G=0.55 Z//	G=0.35 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]
9 11/32"	120	4 3/4"	110	4 3/8"	45	1.772	204	245	292	321	127	158	194	217
	140	5 1/2"	130	5 1/8"	55	2.165	250	300	337	353	155	193	232	256
	160	6 1/4"	150	6"	65	2.559	282	309	337	353	174	212	241	256
	180	7 1/8"	170	6 1/4"	75	2.953	282	309	337	353	189	216	241	256
	200	7 7/8"	190	7 1/8"	85	3.346	282	309	337	353	192	216	241	256
	220	8 5/8"	210	7 7/8"	95	3.740	282	309	337	353	192	216	241	256
	240	9 1/2"	230	8 5/8"	105	4.134	282	309	337	353	192	216	241	256
	260	10 1/4"	250	9 1/2"	115	4.528	282	309	337	353	192	216	241	256
	280	11"	270	10 1/4"	125	4.921	282	309	337	353	192	216	241	256
	300	11 7/8"	290	11"	135	5.315	282	309	337	353	192	216	241	256
	320	12 5/8"	310	11 7/8"	145	5.709	282	309	337	353	192	216	241	256
	340	13 3/8"	330	12 5/8"	155	6.102	282	309	337	353	192	216	241	256
	360	14 1/4"	350	13 3/8"	165	6.496	282	309	337	353	192	216	241	256
	380	15"	370	14 1/4"	175	6.890	282	309	337	353	192	216	241	256
	400	15 3/4"	390	15"	185	7.283	282	309	337	353	192	216	241	256
	440	17 1/4"	430	15 3/4"	205	8.071	282	309	337	353	192	216	241	256
480	19"	470	17 1/4"	225	8.858	282	309	337	353	192	216	241	256	
520	20 1/2"	510	19 3/4"	245	9.646	282	309	337	353	192	216	241	256	
11 7/16"	100	4"	90	3 4/8"	35	1.378	188	226	269	296	112	139	171	192
	125	4 3/4"	115	4 3/8"	48	1.870	256	307	365	402	153	189	232	260
	150	6"	140	5 1/2"	60	2.362	323	388	461	496	193	239	292	322
	175	6 1/4"	165	6 1/4"	73	2.854	390	433	473	496	222	269	325	349
	200	7 7/8"	190	7 1/8"	85	3.346	395	433	473	496	242	294	328	349
	225	8 5/8"	215	7 7/8"	98	3.839	395	433	473	496	261	294	328	349
	250	9 1/2"	240	9 1/2"	110	4.331	395	433	473	496	261	294	328	349
	275	10 1/4"	265	10 1/4"	123	4.823	395	433	473	496	261	294	328	349
	300	11 7/8"	290	11"	135	5.315	395	433	473	496	261	294	328	349
	325	12 5/8"	315	11 7/8"	148	5.807	395	433	473	496	261	294	328	349
	350	13 3/8"	340	13 3/8"	160	6.299	395	433	473	496	261	294	328	349
	375	14 1/4"	365	14 1/4"	173	6.791	395	433	473	496	261	294	328	349
	400	15 3/4"	390	15"	185	7.283	395	433	473	496	261	294	328	349
	450	17 1/4"	440	17 1/4"	210	8.268	395	433	473	496	261	294	328	349
	500	19 3/4"	490	19"	235	9.252	395	433	473	496	261	294	328	349
	550	20 1/2"	540	20 1/2"	260	10.236	395	433	473	496	261	294	328	349
600	23 5/8"	590	22"	285	11.220	395	433	473	496	261	294	328	349	
700	23 5/8"	690	23 5/8"	335	13.189	395	433	473	496	261	294	328	349	
800	23 5/8"	790	23 5/8"	385	15.157	395	433	473	496	261	294	328	349	
13 9/16"	100	4"	90	3 4/8"	35	1.378	196	235	280	308	113	140	172	193
	200	7 7/8"	190	7 1/8"	85	3.346	427	467	510	535	242	294	345	367
	300	11 7/8"	290	11"	135	5.315	427	467	510	535	274	308	345	367
	400	15 3/4"	390	15"	185	7.283	427	467	510	535	274	308	345	367
	500	19 3/4"	490	19"	235	9.252	427	467	510	535	274	308	345	367
	600	23 5/8"	590	22"	285	11.220	427	467	510	535	274	308	345	367
	700	23 5/8"	690	23 5/8"	335	13.189	427	467	510	535	274	308	345	367
	800	23 5/8"	790	23 5/8"	385	15.157	427	467	510	535	274	308	345	367
	900	23 5/8"	890	23 5/8"	435	17.126	427	467	510	535	274	308	345	367
	1000	23 5/8"	990	23 5/8"	485	19.094	427	467	510	535	274	308	345	367
	1100	23 5/8"	1090	23 5/8"	535	21.063	427	467	510	535	274	308	345	367
	1200	23 5/8"	1190	23 5/8"	585	23.031	427	467	510	535	274	308	345	367

EFFECTIVE THREAD USED IN CALCULATION

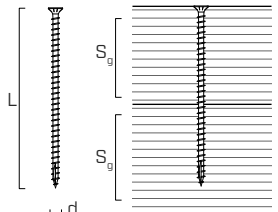
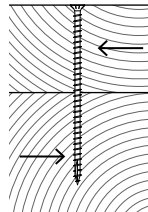


b = L - 10 mm represents the entire length of the threaded part
S_g = (L - 10 mm - 10 mm - Tol.) / 2 represents the partial length of the threaded part net of a laying tolerance (Tol.) of 10 mm

The extraction, shear and sliding values were calculated placing the centre of gravity of the connector in correspondence with the shear plane and considering an effective thread of S_g.

The allowable extraction values are calculated considering the threaded part (b or S_g) as being completely inserted into the wood.

STATIC VALUES: SHEAR WOOD-WOOD

GEOMETRY							WOOD-WOOD Z_L			
										
							REFERENCE LATERAL DESIGN VALUE (Z) FOR:			
d_1	Length L		Thread length b		S_g		G=0.35 Z_L	G=0.42 Z_L	G=0.50 Z_L	G=0.55 Z_L
$\frac{[mm]}{[inch]}$	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[lbf]	[lbf]	[lbf]	[lbf]
9 11/32"	120	4 3/4"	110	4 3/8"	45	1.772	93	122	157	180
	140	5 1/2"	130	5 1/8"	55	2.165	114	149	191	220
	160	6 1/4"	150	6"	65	2.559	135	176	220	236
	180	7 1/8"	170	6 1/4"	75	2.953	156	194	220	236
	200	7 7/8"	190	7 1/8"	85	3.346	170	194	220	236
	220	8 5/8"	210	7 7/8"	95	3.740	170	194	220	236
	240	9 1/2"	230	8 5/8"	105	4.134	170	194	220	236
	260	10 1/4"	250	9 1/2"	115	4.528	170	194	220	236
	280	11"	270	10 1/4"	125	4.921	170	194	220	236
	300	11 7/8"	290	11"	135	5.315	170	194	220	236
	320	12 5/8"	310	11 7/8"	145	5.709	170	194	220	236
	340	13 3/8"	330	12 5/8"	155	6.102	170	194	220	236
	360	14 1/4"	350	13 3/8"	165	6.496	170	194	220	236
	380	15"	370	14 1/4"	175	6.890	170	194	220	236
	400	15 3/4"	390	15"	185	7.283	170	194	220	236
	440	17 1/4"	430	15 3/4"	205	8.071	170	194	220	236
11 7/16"	480	19"	470	17 1/4"	225	8.858	170	194	220	236
	520	20 1/2"	510	19 3/4"	245	9.646	170	194	220	236
	100	4"	90	3 4/8"	35	1.378	78	101	130	150
	125	4 3/4"	115	4 3/8"	48	1.870	106	138	177	203
	150	6"	140	5 1/2"	60	2.362	133	174	224	257
	175	6 1/4"	165	6 1/4"	73	2.854	161	210	270	310
	200	7 7/8"	190	7 1/8"	85	3.346	189	246	294	315
	225	8 5/8"	215	7 7/8"	98	3.839	217	259	294	315
	250	9 1/2"	240	9 1/2"	110	4.331	227	259	294	315
	275	10 1/4"	265	10 1/4"	123	4.823	227	259	294	315
	300	11 7/8"	290	11"	135	5.315	227	259	294	315
	325	12 5/8"	315	11 7/8"	148	5.807	227	259	294	315
	350	13 3/8"	340	13 3/8"	160	6.299	227	259	294	315
	375	14 1/4"	365	14 1/4"	173	6.791	227	259	294	315
	400	15 3/4"	390	15"	185	7.283	227	259	294	315
	450	17 1/4"	440	17 1/4"	210	8.268	227	259	294	315
13 9/16"	500	19 3/4"	490	19"	235	9.252	227	259	294	315
	550	20 1/2"	540	20 1/2"	260	10.236	227	259	294	315
	600	23 5/8"	590	22"	285	11.220	227	259	294	315
	700	23 5/8"	690	23 5/8"	335	13.189	227	259	294	315
	800	23 5/8"	790	23 5/8"	385	15.157	227	259	294	315
	100	4"	90	3 4/8"	35	1.378	74	97	125	143
	200	7 7/8"	190	7 1/8"	85	3.346	181	235	303	326
	300	11 7/8"	290	11"	135	5.315	235	268	305	326
	400	15 3/4"	390	15"	185	7.283	235	268	305	326
	500	19 3/4"	490	19"	235	9.252	235	268	305	326
	600	23 5/8"	590	22"	285	11.220	235	268	305	326
	700	23 5/8"	690	23 5/8"	335	13.189	235	268	305	326
	800	23 5/8"	790	23 5/8"	385	15.157	235	268	305	326
	900	23 5/8"	890	23 5/8"	435	17.126	235	268	305	326
	1000	23 5/8"	990	23 5/8"	485	19.094	235	268	305	326
	1100	23 5/8"	1090	23 5/8"	535	21.063	235	268	305	326
	1200	23 5/8"	1190	23 5/8"	585	23.031	235	268	305	326

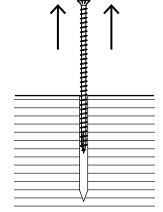
NOTES

- Values based on the "Technical Design Guide USA", download from www.rothoblaas.com
- 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
- 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]

TRACTION THREAD WITHDRAWAL

WITHDRAWAL				
				
d_1	G=0.35 W	G=0.42 W	G=0.50 W	G=0.55 W
$\frac{[mm]}{[inch]}$	[lbs/in]	[lbs/in]	[lbs/in]	[lbs/in]
9 11/32"	171	225	292	337
11 7/16"	199	262	340	392
13 9/16"	226	296	385	444