VGZ

ELC-4645 ESR-4645 UKTA-0836 22/6195 ETA-11/0030

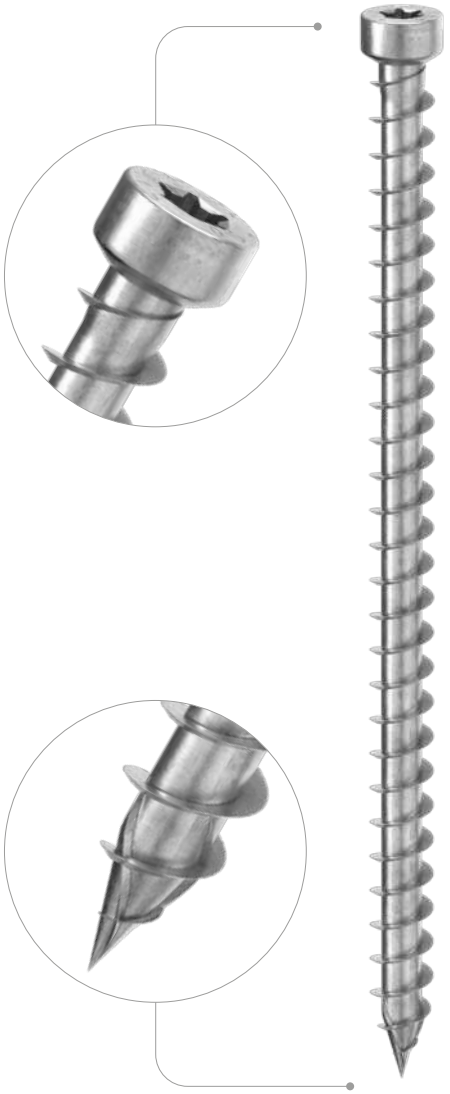
FULL THREADED SCREW WITH CYLINDRICAL HEAD

3 THORNS TIP
Thanks to the 3 THORNS tip, minimum installation distances are reduced. More screws can be used in less space and larger screws in smaller elements. Costs and time for project implementation are reduced.

STRUCTURAL APPLICATIONS
Approved for structural applications subject to stresses in any direction vs the grain (0° - 90°). Cyclical SEISMIC-REV tests according to EN 12512.

CYLINDRICAL HEAD
It allows the screw to penetrate and pass through the surface of the wood substrate. Ideal for concealed joints, timber couplings and structural reinforcements. It is the right choice to ensure strength in fire conditions.

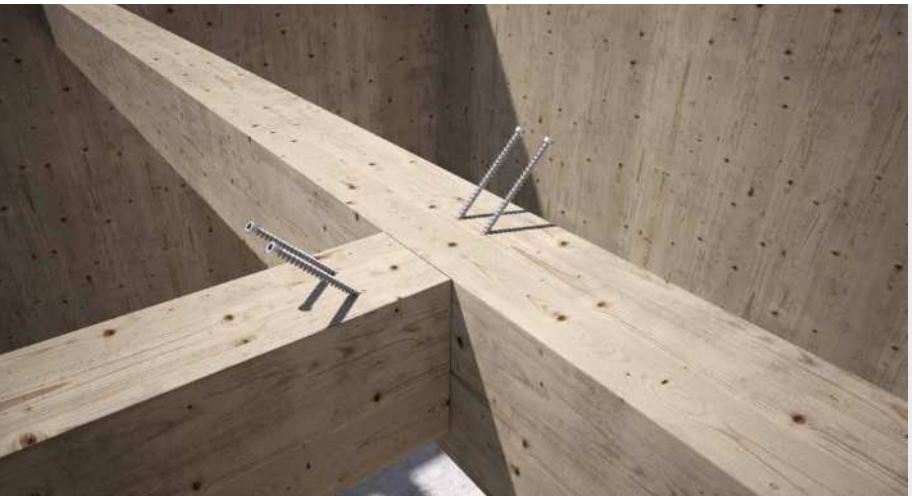
TIMBER FRAME
Also ideal for joining small timber elements such as the crossbeams and uprights of light frame structures.



MY PROJECT SOFTWARE | VIDEO

BIT INCLUDED

DIAMETER [in]	0.20 **0.28** **0.44** 0.44
LENGTH [in]	3 1/8 **3 1/8** **39 3/8** 39 3/8
EXPOSURE CONDITION	EC1 DRY
ATMOSPHERIC CORROSIVITY	C1 C2
WOOD CORROSIVITY	T1 T2
MATERIAL	Zn ELECTRO PLATED electrogalvanized carbon steel



FIELDS OF USE

- timber based panels
- solid timber
- glulam (Glued Laminated Timber)
- CLT and LVL
- high density woods

STRUCTURAL RESTORATION

Ideal for coupling beams in structural renovations and new works. Can also be used parallel to the grain thanks to the special approval.

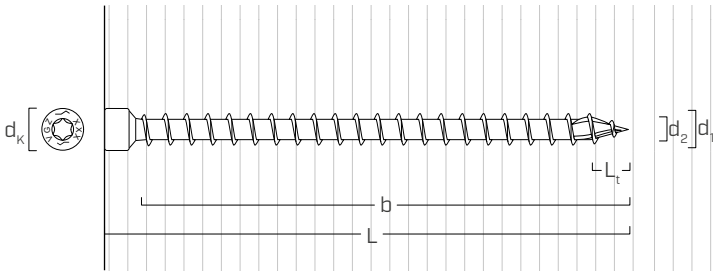
CLT, LVL

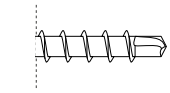
Values also tested, certified and calculated for CLT and high density woods such as LVL, Plywood or other laminated veneer products.

Very high stiffness in side-by-side joining of CLT floors. Application with double inclination at 45°, perfect combined with the JIG VGZ template.

Reinforcement orthogonal to grain for hanging load due to joining of main-secondary beams.

GEOMETRY AND MECHANICAL CHARACTERISTICS





Ø0.36 in | L > 20 1/2"
Ø0.44 in | L > 23 5/8"

GEOMETRY

Nominal diameter	**d_1**	**[in](1)**	**0.28**	**0.36**	**0.44**
Outer thread diameter	**d_1**	[mm]	7	9	11
		[in]	**0.276**	**0.354**	**0.433**
Head diameter	d_K	[in]	0.374	0.453	0.531
Root diameter	d_2	[in]	0.181	0.232	0.260
Tip Length	L_t	[in]	0.276	0.354	0.433
Pre-drilling hole diameter(2)	$d_{V,G\leq 0.55}$	[in]	5/32	13/64	15/64
Pre-drilling hole diameter(3)	$d_{V,G>0.55}$	[in]	13/64	15/64	9/32

(1) The nominal diameter of the screw is converted into imperial units and rounded up to the nearest decimal point.
(2) Pre-drilling applies to timber with G≤0.55 (optional).
(3) Pre-drilling applies to timber with G>0.55 (required).

MECHANICAL PARAMETERS

Nominal diameter	**d_1**	[in]	0.28	0.36	0.44
Tensile strength (allowable)	f_{tens}	[lbf]	1450	2450	3200
Bending yield strength (specified)	$F_{y,b}$	[psi]	195000	180000	170000

Nominal diameter	**d_1**	[in]		0.28	0.36	0.44
Withdrawal (design value)	W_{90}	[lbf/in]	G = 0.35	141	192	207
			G = 0.42	164	220	240
			G = 0.49	185	255	272
			G = 0.55	203	280	298
minimum embedded length		[in]		1 5/8	2 1/8	2 5/8

CODES AND DIMENSIONS

d_1 [mm] [in]	CODE	L [mm]	L [in]	b [mm]	b [in]	pcs	
7 **0.28 #16 TX 30**	**VGZ780**	80	3 1/8	70	2 3/4	50	
	VGZ7100	100	4	90	3 1/2	50	
	VGZ7120	120	4 3/4	110	4 3/8	50	
	VGZ7140	140	5 1/2	130	5 1/8	50	
	VGZ7160	160	6 1/4	150	6	50	
	VGZ7180	180	7 1/8	170	6 3/4	50	
	VGZ7200	200	8	190	7 1/2	50	
	VGZ7220	220	8 5/8	210	8 1/4	50	
	VGZ7240	240	9 1/2	230	9 1/16	50	
	VGZ7260	260	10 1/4	250	10	50	
	VGZ7280	280	11	270	10 5/8	50	
	VGZ7300	300	11 3/4	290	11 7/16	50	
	VGZ7320	320	12 5/8	310	12 3/16	50	
	VGZ7340	340	13 3/8	330	13	50	
	VGZ7360	360	14 1/4	350	13 3/4	50	
	VGZ7380	380	15	370	14 9/16	50	
	VGZ7400	400	15 3/4	390	15 3/8	50	
9 **0.36 TX 40**	**VGZ9160**	160	6 1/4	150	6	50	
	VGZ9180	180	7 1/8	170	6 3/4	50	
	VGZ9200	200	8	190	7 1/2	50	
	VGZ9220	220	8 5/8	210	8 1/4	50	
	VGZ9240	240	9 1/2	230	9 1/16	50	
	VGZ9260	260	10 1/4	250	10	50	
	VGZ9280	280	11	270	10 5/8	50	
	VGZ9300	300	11 3/4	290	11 7/16	50	
	VGZ9320	320	12 5/8	310	12 3/16	50	
	VGZ9340	340	13 3/8	330	13	50	
	VGZ9360	360	14 1/4	350	13 3/4	50	
	VGZ9380	380	15	370	14 9/16	50	
	VGZ9400	400	15 3/4	390	15 3/8	50	
	VGZ9440	440	17 1/4	430	16 15/16	25	
	VGZ9480	480	19	470	18 1/2	25	
	VGZ9520	520	20 1/2	510	20 1/16	25	
	VGZ9560	560	22	550	21 5/8	25	
	VGZ9600	600	23 5/8	590	23 1/4	25	

d_1 [mm] [in]	CODE	L [mm]	L [in]	b [mm]	b [in]	pcs	
11 **0.44 TX 50**	**VGZ11150**	150	6	140	5 1/2	25	
	VGZ11200	200	8	190	7 1/2	25	
	VGZ11250	250	10	240	9 1/2	25	
	VGZ11275	275	10 7/8	265	10 7/16	25	
	VGZ11300	300	11 3/4	290	11 7/16	25	
	VGZ11325	325	12 3/4	315	12 3/8	25	
	VGZ11350	350	13 3/4	340	13 3/8	25	
	VGZ11375	375	14 3/4	365	14 3/8	25	
	VGZ11400	400	15 3/4	390	15 3/8	25	
	VGZ11425	425	16 3/4	415	16 5/16	25	
	VGZ11450	450	17 3/4	440	17 1/4	25	
	VGZ11475	475	18 11/16	465	18 5/16	25	
	VGZ11500	500	19 3/4	490	19 5/16	25	
	VGZ11525	525	20 11/16	515	20 1/4	25	
	VGZ11550	550	21 5/8	540	21 1/4	25	
	VGZ11575	575	22 5/8	565	22 1/4	25	
	VGZ11600	600	23 5/8	590	23 1/4	25	
	VGZ11650	650	25 9/16	640	25 3/16	25	
	VGZ11700	700	27 1/2	690	27 3/16	25	
	VGZ11750	750	29 1/2	740	29 1/8	25	
	VGZ11800	800	31 1/2	790	31 1/8	25	
	VGZ11850	850	33 7/16	840	33 1/16	25	
	VGZ11900	900	35 1/2	890	35 1/16	25	
	VGZ11950	950	37 3/8	940	37	25	
	VGZ111000	1000	39 3/8	990	39	25	

RELATED PRODUCTS

JIG VGZ 45°

TEMPLATE FOR 45° SCREWS

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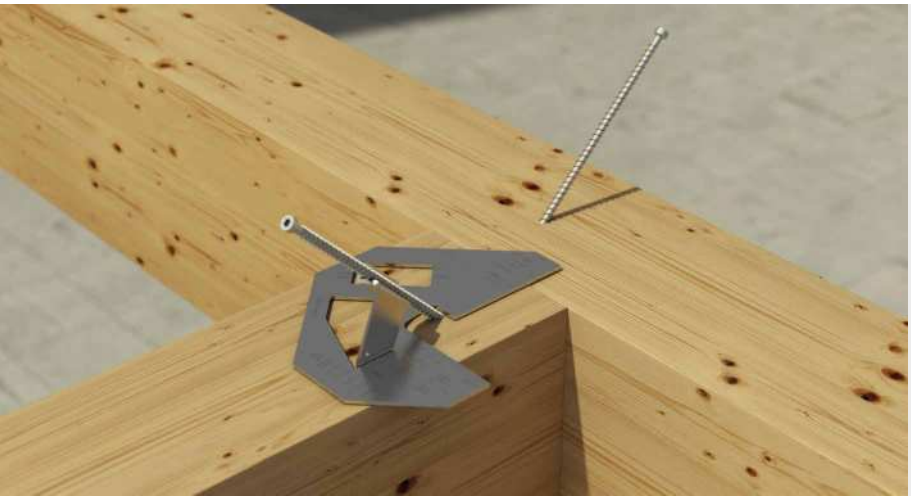
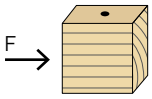


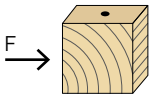
JIG VGZ 45° TEMPLATE

Installation at 45° using the JIG VGZ steel template.

MINIMUM DISTANCES FOR SHEAR LOADS | TIMBER

screws inserted **WITHOUT pre-drilled hole** — **G ≤ 0.50**

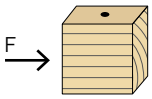


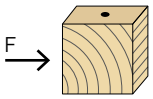


d_1	[in]		0.28	0.36	0.44
	[mm]		7	9	11
a_1	[in]	**15·d**	4 1/8	5 5/16	6 1/2
a_2	[in]	**5·d**	1 3/8	1 3/4	2 3/16
$a_{3,t}$	[in]	**15·d**	4 1/8	5 5/16	6 1/2
$a_{3,c}$	[in]	**10·d**	2 3/4	3 1/2	4 3/8
$a_{4,t}$	[in]	**10·d**	2 3/4	3 1/2	4 3/8
$a_{4,c}$	[in]	**5·d**	1 3/8	1 3/4	2 3/16

	0.28	0.36	0.44
	7	9	11
10·d	2 3/4	3 1/2	4 3/8
5·d	1 3/8	1 3/4	2 3/16
15·d	4 1/8	5 5/16	6 1/2
10·d	2 3/4	3 1/2	4 3/8
10·d	2 3/4	3 1/2	4 3/8
5·d	1 3/8	1 3/4	2 3/16

screws inserted **WITHOUT pre-drilled hole** — **G > 0.50**

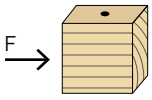


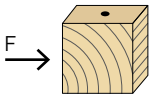


d_1	[in]		0.28	0.36	0.44
	[mm]		7	9	11
a_1	[in]	**15·d**	4 1/8	5 5/16	6 1/2
a_2	[in]	**7·d**	1 15/16	2 1/2	3 1/16
$a_{3,t}$	[in]	**20·d**	5 1/2	7 1/8	8 5/8
$a_{3,c}$	[in]	**15·d**	4 1/8	5 5/16	6 1/2
$a_{4,t}$	[in]	**12·d**	3 5/16	4 1/4	5 3/16
$a_{4,c}$	[in]	**7·d**	1 15/16	2 1/2	3 1/16

	0.28	0.36	0.44
	7	9	11
10·d	2 3/4	3 1/2	4 3/8
7·d	1 15/16	2 1/2	3 1/16
20·d	5 1/2	7 1/8	8 5/8
15·d	4 1/8	5 5/16	6 1/2
12·d	3 5/16	4 1/4	5 3/16
7·d	1 15/16	2 1/2	3 1/16

screws inserted **WITH pre-drilled hole**

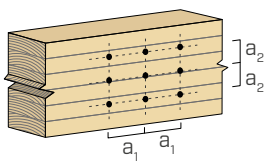




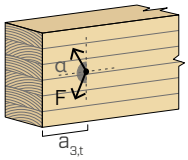
d_1	[in]		0.28	0.36		0.44
	[mm]		7	9		11
a_1	[in]	**10·d**	2 3/4	3 1/2	**5·d**	2 3/16
a_2	[in]	**4·d**	1 1/8	1 7/16	**5·d**	2 3/16
$a_{3,t}$	[in]	**12·d**	3 5/16	4 1/4	**7·d**	3 1/16
$a_{3,c}$	[in]	**7·d**	1 15/16	2 1/2	**4·d**	1 3/4
$a_{4,t}$	[in]	**7·d**	1 15/16	2 1/2	**4·d**	1 3/4
$a_{4,c}$	[in]	**3·d**	13/16	1 1/16	**3·d**	1 5/16

	0.28	0.36		0.44
	7	9		11
5·d	1 3/8	1 3/4	**5·d**	2 3/16
4·d	1 1/8	1 7/16	**5·d**	2 3/16
12·d	3 5/16	4 1/4	**7·d**	3 1/16
7·d	1 15/16	2 1/2	**4·d**	1 3/4
7·d	1 15/16	2 1/2	**4·d**	1 3/4
3·d	13/16	1 1/16	**3·d**	1 5/16

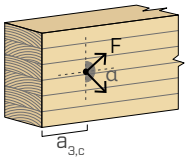
α = load-to-grain angle
d = d_1 = nominal diameter of the screw



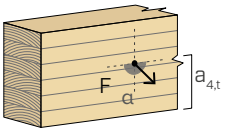
stressed end
-90° < α < 90°



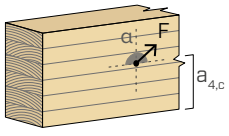
unloaded end
90° < α < 270°



stressed edge
0° < α < 180°



unload edge
180° < α < 360°



NOTES

- The minimum spacing and distances comply with Table 8 of ESR-4645, where d refers to the nominal diameter of the screw;
- Wood member stresses must be checked in accordance with the corresponding Sections of the NDS; end distances, edge distances and fastener spacing may need to be increased accordingly.

MINIMUM DISTANCES FOR AXIAL STRESSES | TIMBER

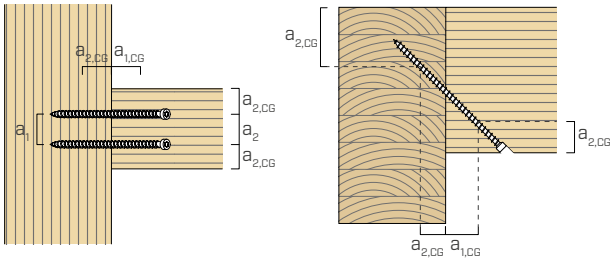
screws inserted **WITHOUT pre-drilled hole**

d_1	[in]		0.28	0.36		0.44
	[mm]		7	9		11
a_1	[in]	**7·d**	1 15/16	2 1/2	**7·d**	3 1/16
a_2	[in]	**4·d**	1 1/8	1 7/16	**5·d**	2 3/16
$a_{1,CG}$	[in]	**10·d**	2 3/4	3 1/2	**10·d**	4 3/8
$a_{2,CG}$	[in]	**4·d**	1 1/8	1 7/16	**4·d**	1 3/4
a_{CROSS}	[in]	**1,5·d**	7/16	9/16	**1,5·d**	11/16

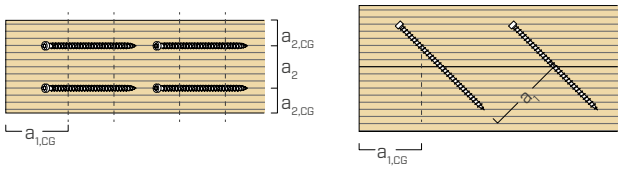
screws inserted **WITH pre-drilled hole**

d_1	[in]		0.28	0.36		0.44
	[mm]		7	9		11
a_1	[in]	**7·d**	1 15/16	2 1/2	**5·d**	2 3/16
a_2	[in]	**3·d**	13/16	1 1/16	**5·d**	2 3/16
$a_{1,CG}$	[in]	**7·d**	1 15/16	2 1/2	**4·d**	1 3/4
$a_{2,CG}$	[in]	**3·d**	13/16	1 1/16	**3·d**	1 5/16
a_{CROSS}	[in]	**1,5·d**	7/16	9/16	**1,5·d**	11/16

SCREWS UNDER TENSION INSERTED WITH AN ANGLE α WITH RESPECT TO THE GRAIN

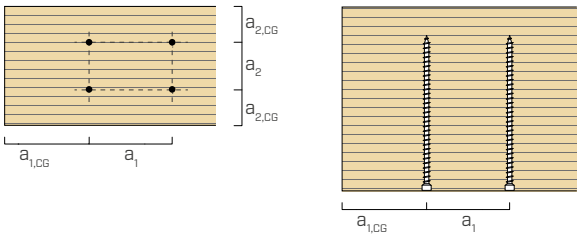


plan front



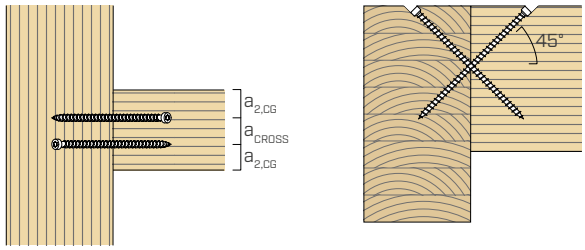
plan front

SCREWS INSERTED WITH α = 90° ANGLE WITH RESPECT TO THE GRAIN



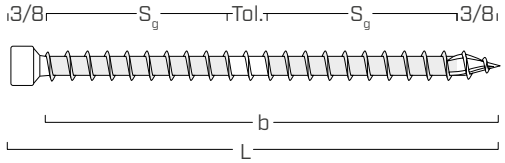
plan front

CROSSED SCREWS INSERTED WITH AN ANGLE α WITH RESPECT TO THE GRAIN



plan front

EFFECTIVE THREAD USED IN CALCULATION



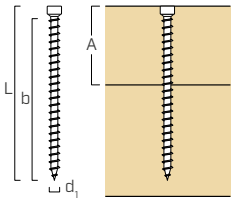
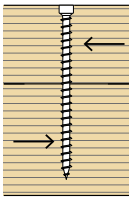
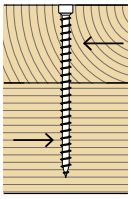
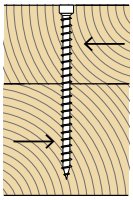
b = $\mathbf{S_{g,tot}}$ = L - 3/8" represents the entire length of the threaded part

$\mathbf{S_g}$ = (L - 3/8" - 3/8" - Tol.)/ 2 represents the partial length of the threaded part net of a laying tolerance (Tol.) of 3/8"

NOTES

- The minimum spacing and distances comply with Table 8 of ESR-4645, where d refers to the nominal diameter of the screw;
- Wood member stresses must be checked in accordance with the corresponding Sections of the NDS; end distances, edge distances and fastener spacing may need to be increased accordingly.

REFERENCE LATERAL DESIGN VALUES (Z) | WOOD-TO-WOOD

geometry					Z_{II}				$Z_{\perp/II}$				$Z_{\perp}$			
																
d_1	L		b	A	G				G				G			
					0.35	0.42	0.49	0.55	0.35	0.42	0.49	0.55	0.35	0.42	0.49	0.55
[mm] [in]	[mm]	[in]	[in]	[in]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]
7 **0.28**	80	3 1/8	2 3/4	1 9/16	118	165	219	263	94	132	175	211	94	132	175	211
	100	4	3 1/2	1 15/16	148	206	242	269	119	165	193	215	119	165	193	215
	120	4 3/4	4 3/8	2 3/8	174	210	242	269	140	168	193	215	140	168	193	215
	140-400	5 1/2-15 3/4	5 1/8-15 3/8	≥ 2 3/4	177	210	242	269	142	168	193	215	142	168	193	215
9 **0.36**	160-600	6 1/4-23 5/8	6-23 1/4	≥ 3 1/8	230	272	313	348	184	217	250	278	184	217	250	278
11 **0.44**	150	6	5 1/2	2 15/16	314	344	372	394	219	252	278	299	178	232	262	285
	200-1000	8-39 3/8	7 1/2-39	≥ 4	314	344	372	394	225	252	278	299	205	234	262	285

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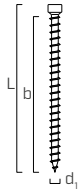
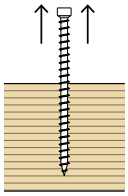
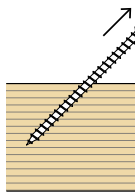
THREAD WITHDRAWAL (W) | WOOD

geometry				thread withdrawal α = 90°				thread withdrawal α = 45°				thread withdrawal α = 0°			
															
d_1	L		b	G				G				G			
				0.35	0.42	0.49	0.55	0.35	0.42	0.49	0.55	0.35	0.42	0.49	0.55
[mm] [in]	[mm]	[in]	[in]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]	[lbf]
7 **0.28**	80	3 1/8	2 3/4	350	407	459	504	318	370	418	458	105	122	138	151
	100	4	3 1/2	461	536	605	663	419	488	550	604	138	161	181	199
	120	4 3/4	4 3/8	572	665	750	823	520	605	683	749	172	200	225	247
	140	5 1/2	5 1/8	683	794	896	983	621	723	815	895	205	238	269	295
	160	6 1/4	6	794	923	1042	1143	722	840	948	1040	238	277	312	343
	180	7 1/8	6 3/4	905	1052	1187	1303	823	958	1080	1185	271	316	356	391
	200	8	7 1/2	1016	1182	1333	1463	924	1075	1213	1331	305	354	400	439
	220	8 5/8	8 1/4	1127	1311	1479	1622	1025	1193	1345	1476	338	393	444	487
	240	9 1/2	9 1/16	1238	1440	1624	1782	1127	1310	1478	1622	371	432	487	535
	260	10 1/4	10	1349	1569	1770	1942	1228	1428	1611	1767	405	471	531	583
	280	11	10 5/8	1460	1698	1916	2102	1329	1545	1743	1913	438	509	575	631
	300	11 3/4	11 7/16	1571	1827	2061	2262	1430	1663	1876	2058	471	548	618	679
	320	12 5/8	12 3/16	1682	1956	2207	2422	1531	1780	2008	2204	505	587	662	726
	340	13 3/8	13	1793	2086	2353	2581	1632	1898	2141	2349	538	626	706	774
	360	14 1/4	13 3/4	1904	2215	2498	2741	1733	2015	2273	2495	571	664	749	822
	380	15	14 9/16	2015	2344	2644	2901	1834	2133	2406	2640	605	703	793	870
	400	15 3/4	15 3/8	2126	2473	2790	3061	1935	2250	2539	2785	638	742	837	918
9 **0.36**	160	6 1/4	6	1066	1221	1416	1554	970	1111	1288	1414	320	366	425	466
	180	7 1/8	6 3/4	1217	1394	1616	1775	1107	1269	1471	1615	365	418	485	532
	200	8	7 1/2	1368	1568	1817	1995	1245	1427	1654	1816	410	470	545	599
	220	8 5/8	8 1/4	1519	1741	2018	2216	1383	1584	1836	2016	456	522	605	665
	240	9 1/2	9 1/16	1671	1914	2219	2436	1520	1742	2019	2217	501	574	666	731
	260	10 1/4	10	1822	2087	2419	2657	1658	1900	2202	2418	547	626	726	797
	280	11	10 5/8	1973	2261	2620	2877	1795	2057	2384	2618	592	678	786	863
	300	11 3/4	11 7/16	2124	2434	2821	3098	1933	2215	2567	2819	637	730	846	929
	320	12 5/8	12 3/16	2275	2607	3022	3318	2071	2372	2750	3019	683	782	907	995
	340	13 3/8	13	2426	2780	3223	3539	2208	2530	2933	3220	728	834	967	1062
	360	14 1/4	13 3/4	2578	2954	3423	3759	2346	2688	3115	3421	773	886	1027	1128
	380	15	14 9/16	2729	3127	3624	3980	2483	2845	3298	3621	819	938	1087	1194
	400	15 3/4	15 3/8	2880	3300	3825	4200	2621	3003	3481	3822	864	990	1148	1260
	440	17 1/4	16 15/16	3182	3646	4227	4641	2896	3318	3846	4223	955	1094	1268	1392
	480	19	18 1/2	3485	3993	4628	5082	3171	3634	4212	4625	1045	1198	1388	1525
	520	20 1/2	20 1/16	3787	4339	5030	5523	3446	3949	4577	5026	1136	1302	1509	1657
	560	22	21 5/8	4089	4686	5431	5964	3721	4264	4942	5427	1227	1406	1629	1789
	600	23 5/8	23 1/4	4392	5032	5833	6405	3997	4579	5308	5828	1318	1510	1750	1921

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