

ROUND HEAD SCREW FOR PLATES

SCREW FOR PERFORATED PLATES

Cylindrical shoulder designed for fastening metal elements. Achieves an interlocking effect with the hole in the plate, thus guaranteeing excellent static performance.

STATICS

These can be calculated in accordance with the CSA-O86 provisions for the lateral resistance of connections. Excellent shear strength values.

NEW-GENERATION WOODS

Tested and certified for use on a wide variety of engineered timbers such as CLT, GL, LVL, OSB and Beech LVL. The LBS5 version up to a length of 40 mm is approved completely without pre-drilling hole on Beech LVL.

DUCTILITY

Excellent ductility behaviour as evidenced by SEISMIC-REV cyclic tests according to EN 12512.



CANADIAN DESIGN VALUES

USA, EU and more design values available online.



DIAMETER [mm]

3,5 ☒ 5 ☐ 7 ☐ 12

LENGTH [mm]

25 ☒ 25 ☐ 100 ☐ 200

SERVICE CONDITION

☒ EC1 ☐ DRY

ATMOSPHERIC CORROSIVITY

☒ C1 ☐ C2

WOOD CORROSIVITY

☒ T1 ☐ T2

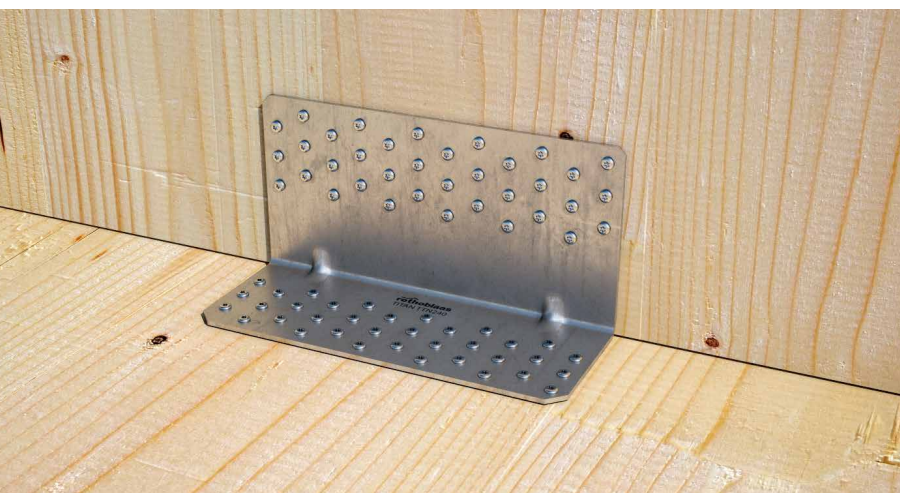
MATERIAL

Zn
ELECTRO
PLATED

electrogalvanized carbon steel

FIELDS OF USE

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



CODES AND DIMENSIONS

d_1 [mm] [in]	CODE	L [mm]	b [mm]	pcs
5 0.20 TX 20	LBS525	25	21	500
	LBS540	40	36	500
	LBS550	50	46	200
	LBS560	60	56	200
	LBS570	70	66	200
7 0.28 TX 30	LBS760	60	55	100
	LBS780	80	75	100
	LBS7100	100	95	100

LBS HARDWOOD EVO

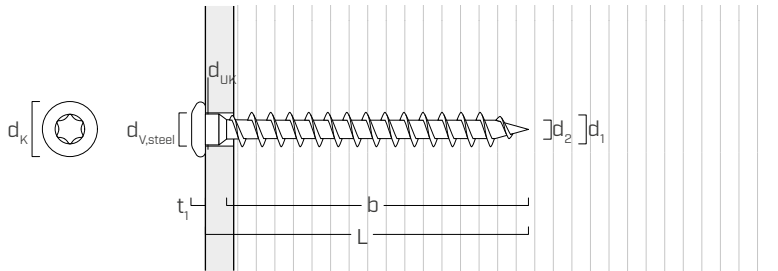
ROUND HEAD SCREW FOR PLATES ON HARDWOODS



DIAMETER [mm]	3	5	7	12
LENGTH [mm]	25	60	200	200

Also available in the LBS HARDWOOD EVO version, L from 60 to 200 mm, diameter Ø5 and Ø7 mm.

GEOMETRY AND MECHANICAL CHARACTERISTICS



GEOMETRY

Nominal diameter	d_1	[mm]	5	7
Head diameter	d_K	[mm]	7,80	11,00
Thread diameter	d_2	[mm]	3,00	4,40
Underhead diameter	d_{UK}	[mm]	4,90	7,00
Head thickness	t_1	[mm]	2,40	3,50
Hole diameter on steel plate	$d_{V,steel}$	[mm]	5,0÷5,5	7,5÷8,0
Pre-drilling hole diameter ⁽¹⁾	$d_{V,S}$	[mm]	3,0	4,0
Pre-drilling hole diameter ⁽²⁾	$d_{V,H}$	[mm]	3,5	5,0

⁽¹⁾ Pre-drilling valid for softwood.

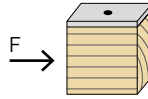
⁽²⁾ Pre-drilling valid for hardwood and beech LVL.

MECHANICAL PARAMETERS

Nominal diameter	d_1	[mm]	5	7
Factored tensile strength	Φf_u	[kN]	5,36	11,59
Bending yield strength	F_{yb}	[MPa]	1066	1102
Specified withdrawal resistance per millimeter of threaded shank (tip included)	Y_w	[N/mm]	G=0.35	52,29
			G=0.42	60,50
			G=0.49	68,44
			G=0.55	75,07

MINIMUM DISTANCES FOR SHEAR LOADS | TIMBER

screws inserted **WITHOUT** pre-drilled hole $G \leq 0.44$

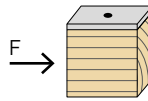


d_1	5 [mm]	0.20 [in]	7 [mm]	0.28 [in]
S_p	12·d [†] 60	2 3/8	84	3 5/16
S_Q	5·d 25	1	35	1 3/8
a_L	15·d [†] 75	2 15/16	105	4 1/8
a	10·d [†] 50	1 15/16	70	2 3/4
e_Q	10·d 50	1 15/16	70	2 3/4
e_p	5·d 25	1	35	1 3/8

[†] For Douglas Fir–Larch and Western Red Cedar, this minimum spacing shall be increased by 50%.

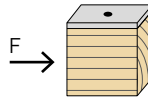
[‡] For Western Red Cedar, this minimum spacing shall be increased by 50%.

screws inserted **WITHOUT** pre-drilled hole $0.44 < G \leq 0.50$



d_1	5 [mm]	0.20 [in]	7 [mm]	0.28 [in]
S_p	18·d 90	3 1/2	126	4 15/16
S_Q	7·d 35	1 3/8	49	1 15/16
a_L	22·d 110	4 3/8	154	6 1/16
a	15·d 75	2 15/16	105	4 1/8
e_Q	12·d 60	2 3/8	84	3 5/16
e_p	7·d 35	1 3/8	49	1 15/16

screws inserted **WITH** pre-drilled hole



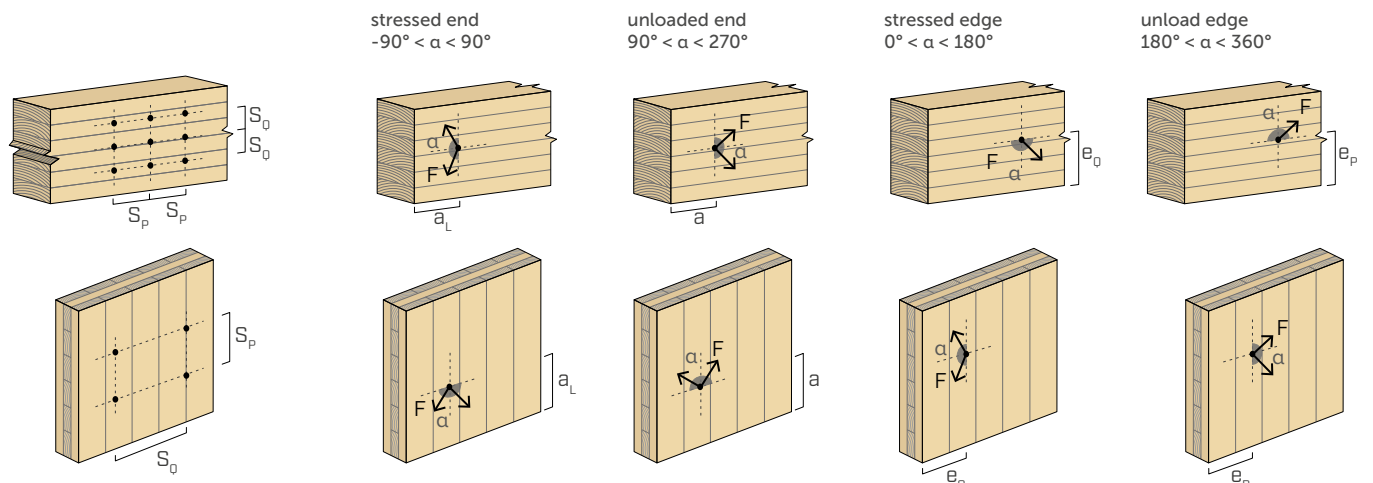
d_1	5 [mm]	0.20 [in]	7 [mm]	0.28 [in]
S_p	5·d [†] 25	1	35	1 3/8
S_Q	4·d 20	13/16	28	1 1/8
a_L	12·d [†] 60	2 3/8	84	3 5/16
a	7·d [†] 35	1 3/8	49	1 15/16
e_Q	7·d 35	1 3/8	49	1 15/16
e_p	3·d 15	9/16	21	13/16

[†] For Douglas Fir–Larch and Western Red Cedar, this minimum spacing shall be increased by 50%.

[‡] For Western Red Cedar, this minimum spacing shall be increased by 50%.

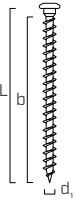
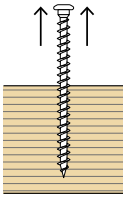
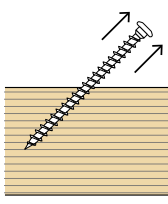
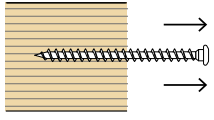
α = load-to-grain angle

$d = d_1$ = nominal diameter of the screw



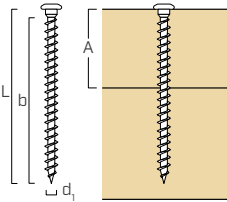
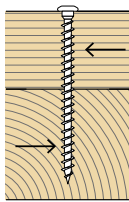
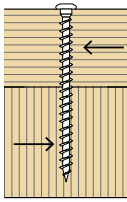
NOTES

- The minimum spacing and distances comply with Clause 12.12.5 of CSA-O86 2024, where d_1 refers to the nominal diameter of the self-tapping screw.

geometry			TENSION ⁽¹⁾											
			thread withdrawal $\alpha = 90^\circ$				thread withdrawal $\alpha = 45^\circ$				thread withdrawal $\alpha = 0^\circ$			
														
d_1 [mm] [in]			factored withdrawal resistance P_{rw}				factored withdrawal resistance P_{rw}				factored withdrawal resistance $P_{rw}^{(2)}$			
			G				G				G			
	L [mm]	b [mm]	0.35 [kN]	0.42 [kN]	0.49 [kN]	0.55 [kN]	0.35 [kN]	0.42 [kN]	0.49 [kN]	0.55 [kN]	0.35 [kN]	0.42 [kN]	0.49 [kN]	0.55 [kN]
5 0.20	25	21	0,59	0,68	0,77	0,84	0,64	0,74	0,84	0,92	0,29	0,34	0,38	0,42
	40	36	1,13	1,31	1,49	1,63	1,24	1,43	1,62	1,78	0,57	0,66	0,74	0,81
	50	46	1,50	1,74	1,96	2,15	1,64	1,89	2,14	2,35	0,75	0,87	0,98	1,08
	60	56	1,87	2,16	2,44	2,68	2,04	2,36	2,67	2,92	0,93	1,08	1,22	1,34
	70	66	2,23	2,58	2,92	3,21	2,44	2,82	3,19	3,50	1,12	1,29	1,46	1,60
7 0.28	60	55	2,05	2,38	2,69	2,95	2,24	2,59	2,93	3,22	1,03	1,19	1,34	1,47
	80	75	2,91	3,37	3,81	4,18	3,17	3,67	4,15	4,56	1,45	1,68	1,90	2,09
	100	95	3,76	4,36	4,93	5,40	4,11	4,75	5,37	5,89	1,88	2,18	2,46	2,70

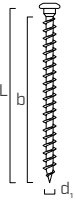
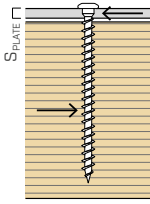
α = screw-to-grain angle

■ STRUCTURAL VALUES | LATERAL RESISTANCE

geometry				SHEAR ⁽³⁾							
				wood-to-wood $\alpha = 90^\circ$				wood-to-wood end grain $\alpha = 0^\circ$			
											
d_1 [mm] [in]				factored lateral resistance N_r				factored lateral resistance $N_r^{(2)}$			
				G				G			
	L [mm]	b [mm]	$A^{(4)}$ [mm]	0.35 [kN]	0.42 [kN]	0.49 [kN]	0.55 [kN]	0.35 [kN]	0.42 [kN]	0.49 [kN]	0.55 [kN]
5 0.20	25	21	7,5	0,25	0,30	0,34	0,39	0,16	0,19	0,22	0,24
	40	36	15	0,45	0,53	0,62	0,69	0,31	0,37	0,42	0,47
	50	46	20	0,58	0,69	0,77	0,84	0,39	0,46	0,54	0,60
	60	56	25	0,70	0,80	0,89	0,98	0,47	0,54	0,61	0,66
	70	66	30	0,78	0,90	0,99	1,06	0,52	0,59	0,66	0,72
7 0.28	60	55	25	0,87	1,03	1,20	1,34	0,58	0,68	0,79	0,88
	80	75	35	1,20	1,42	1,64	1,80	0,78	0,93	1,06	1,16
	100	95	45	1,50	1,73	1,94	2,08	0,94	1,07	1,20	1,30

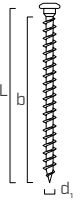
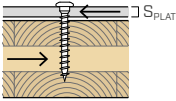
α = screw-to-grain angle

NOTES and GENERAL PRINCIPLES on page 7.

geometry			SHEAR steel-to-timber $\alpha = 90^\circ$					
								
d_1	L	b	steel plate thickness S_{PLATE}		factored lateral resistance $N_r^{(3)}$			
$\begin{matrix} [mm] \\ [in] \end{matrix}$	[mm]	[mm]	[mm]	[in]	G=0.35 [kN]	G=0.42 [kN]	G=0.49 [kN]	G=0.55 [kN]
5 0.20	25 ⁽⁵⁾	21	1,6	1/16	0,75	0,86	0,95	1,03
	40	36			1,02	1,17	1,31	1,42
	50	46			1,19	1,32	1,45	1,55
	60	56			1,28	1,43	1,57	1,68
	70	66			1,37	1,53	1,69	1,81
	40	36	3,2	1/8	1,01	1,15	1,30	1,41
	50	46			1,18	1,32	1,45	1,55
	60	56			1,28	1,43	1,57	1,68
	70	66			1,37	1,53	1,69	1,81
	40	36	6,4	1/4	0,96	1,10	1,23	1,34
	50	46			1,14	1,30	1,42	1,52
	60	56			1,26	1,40	1,54	1,65
	70	66			1,35	1,51	1,66	1,78
	50	46	9,5	3/8	1,08	1,24	1,38	1,48
	60	56			1,23	1,37	1,50	1,61
	70	66			1,32	1,47	1,62	1,74
	50	46	12,7	1/2	1,02	1,17	1,32	1,44
	60	56			1,20	1,34	1,46	1,57
	70	66			1,29	1,44	1,58	1,70
	50	46	15,9	5/8	0,97	1,11	1,24	1,35
	60	56			1,14	1,30	1,43	1,53
	70	66			1,26	1,41	1,55	1,66
	50	46	19,1	3/4	0,91	1,04	1,16	1,27
	60	56			1,09	1,25	1,39	1,49
	70	66			1,23	1,37	1,51	1,62
7 0.28	60	55	1,6	1/16	1,98	2,26	2,54	2,77
	80	75			2,37	2,64	2,90	3,10
	100	95			2,59	2,89	3,2	3,41
	60	55	3,2	1/8	1,96	2,24	2,51	2,74
	80	75			2,37	2,64	2,90	3,10
	100	95			2,59	2,89	3,18	3,41
	60	55	6,4	1/4	1,91	2,18	2,45	2,67
	80	75			2,34	2,63	2,88	3,08
	100	95			2,57	2,88	3,16	3,39
	60	55	9,5	3/8	1,84	2,10	2,35	2,56
	80	75			2,27	2,59	2,83	3,04
	100	95			2,54	2,84	3,11	3,34
	60	55	12,7	1/2	1,77	2,02	2,26	2,46
	80	75			2,20	2,53	2,79	2,99
	100	95			2,51	2,80	3,07	3,29
	60	55	15,9	5/8	1,70	1,94	2,17	2,36
	80	75			2,14	2,45	2,75	2,94
	100	95			2,47	2,76	3,03	3,24
	60	55	19,1	3/4	1,63	1,86	2,08	2,26
	80	75			2,07	2,37	2,66	2,89
	100	95			2,44	2,72	2,98	3,20

α = screw-to-grain angle

NOTES and GENERAL PRINCIPLES on page 7.

geometry			SHEAR				
			steel-to-CLT lateral face ⁽⁶⁾				
							
d ₁	L	b	steel plate thickness S _{PLATE}		factored lateral resistance N _r ⁽³⁾		
			[mm]	[in]	E3 G=0.35 [kN]	E1 and V2 G=0.42 [kN]	E2 and V1 G=0.49 [kN]
5 0.20	25 ⁽⁵⁾	21	1,6	1/16	0,71	0,81	0,90
	40	36			0,97	1,11	1,24
	50	46			1,14	1,28	1,40
	60	56			1,24	1,38	1,52
	70	66			1,33	1,49	1,64
	40	36	3,2	1/8	0,95	1,09	1,23
	50	46			1,12	1,28	1,40
	60	56			1,24	1,38	1,52
	70	66			1,33	1,49	1,64
	40	36	6,4	1/4	0,91	1,04	1,16
	50	46			1,08	1,24	1,37
	60	56			1,21	1,36	1,49
	70	66			1,31	1,46	1,61
	50	46	9,5	3/8	1,02	1,17	1,32
	60	56			1,19	1,32	1,45
	70	66			1,28	1,43	1,57
	50	46	12,7	1/2	0,97	1,11	1,25
	60	56			1,14	1,29	1,42
	70	66			1,25	1,40	1,54
	50	46	15,9	5/8	0,92	1,05	1,17
	60	56			1,09	1,25	1,38
	70	66			1,22	1,36	1,50
	50	46	19,1	3/4	0,86	0,98	1,10
	60	56			1,03	1,18	1,33
	70	66			1,19	1,33	1,46
7 0.28	60	55	1,6	1/16	1,87	2,14	2,40
	80	75			2,28	2,55	2,80
	100	95			2,50	2,80	3,08
	60	55	3,2	1/8	1,85	2,12	2,38
	80	75			2,26	2,55	2,80
	100	95			2,50	2,80	3,08
	60	55	6,4	1/4	1,81	2,07	2,32
	80	75			2,22	2,54	2,78
	100	95			2,49	2,78	3,06
	60	55	9,5	3/8	1,74	1,99	2,23
	80	75			2,15	2,47	2,74
	100	95			2,46	2,74	3,02
	60	55	12,7	1/2	1,68	1,91	2,14
	80	75			2,09	2,40	2,69
	100	95			2,42	2,71	2,97
	60	55	15,9	5/8	1,61	1,84	2,05
	80	75			2,02	2,32	2,61
	100	95			2,39	2,67	2,93
	60	55	19,1	3/4	1,55	1,76	1,96
	80	75			1,96	2,24	2,52
	100	95			2,35	2,63	2,88

NOTES and GENERAL PRINCIPLES on page 7.

STRUCTURAL VALUES

GENERAL PRINCIPLES

- The reference factored lateral resistance for self-tapping screws has been determined following the guidelines in Clause 12.12 of the CSA-O86 2024 including the withdrawal restraint effect. Listed values are based on standard term load duration factor ($K_D = 1.0$), dry service condition factor ($K_{SF} = 1.0$), and treatment factor ($K_T = 1.0$).
- The steel plate is assumed to be ASTM A36 with a minimum ultimate tensile strength, f_u , equal to 58 ksi (400 MPa).
- The reference lateral design values are calculated for screws inserted without pre-drilling hole as per CSA-O86 Clause 12.12.10.5.3. The direction of the bearing-to-grain angle does not influence lateral resistance.
- LBS screws must be positioned in accordance with the minimum distances.
- As part of the connection design, the designer must size and verify both the structural wood members and the steel plates separately.
- In the case of combined shear and tensile stress, the interaction between shear and tension must be satisfied.
- G is the mean relative density according to CSA-O86 2024 Table A.12. Most common wood species are assumed such as Northern species ($G = 0.35$), Spruce-Pine-Fir ($G = 0.42$), Douglas Fir ($G = 0.49$), and Southern Pine ($G = 0.55$).

NOTES

- (1) Factored withdrawal resistances were calculated with the entire threaded portion of the screw, b (in millimeters), minus the tip length, L_{tip} . The length of the tip is equal to the nominal diameter of the respective fasteners, d_1 , as specified in Table 2A of the ELC-4645 report. Factor for fastener axis-to-grain angle, J_{Q1} , and the factor for dowel bearing effect for laterally loaded connections, J_{W1} , varies according to connection geometry.
- (2) The angle between the fastener axis and the grain direction of the wood member, α , is taken as zero for the end grain calculations.
- (3) Lateral resistances are factored and according to CSA-O86 2024 Clause 12.12.10. Values apply to dry service conditions and are representative of a single screw.
- (4) The fixable thickness (A) is considered as half the length of the screw ($L/2$) - 5 mm.
- (5) The LBS screw with a length of 25 mm does not meet the minimum penetration requirements as specified in CSA-O86. Discretion and engineering judgment must be exercised to assess the impact of reduced penetration on the connection's capacity.
- (6) The resistance for CLT includes the application of the $J_x = 0.9$ factor.