SBD

BIT INCLUDED | MY PROJECT SOFTWARE | VIDEO | CE EN 14592

SELF-DRILLING DOWEL

STEEL AND ALUMINUM

Special self-perforating timber-to-metal tip geometry that reduces the possibility of breakage. The cylindrical countersunk head ensures an optimal appearance and meets fire-resistance requisites.

INCREASED DIAMETER

The diameter of 7,5 mm ensures a shear resistance of over 15 % and enables optimisation of the number of fasteners.

DOUBLE THREAD

The thread up against the tip (b_1) facilitates screwing. The increased length of the under head thread (b_2) makes for fast, accurate closure.

CHARACTERISTICS

FOCUS	self-drilling, timber-to-metal-to-timber
HEAD	cylindrical, countersunk
DIAMETER	7,5 mm
LENGTH	from 55 to 235 mm

VIDEO
Scan the QR Code and watch the video on our YouTube channel

MATERIAL

Galvanized carbon steel.

FIELDS OF USE

Self-drilling system for concealed timber-to. steel joints. Can be used with screw guns running at 600-1500 rpm with:

- steel S235 ≤ 10,0 mm
- steel S275 ≤ 8,0 mm
- steel S355 ≤ 6,0 mm
- ALUMINI, ALUMIDI and ALUMAXI brackets

Service classes 1 and 2.

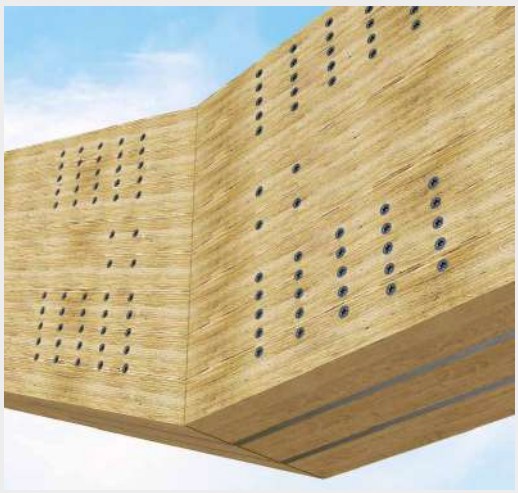
KNEE BEAM

Ideal for joining head beams and making continuous beams, restoring shear forces and momentum. The small dowel diameter guarantees joints that offer high stiffness.

MOMENT RESISTING JOINT

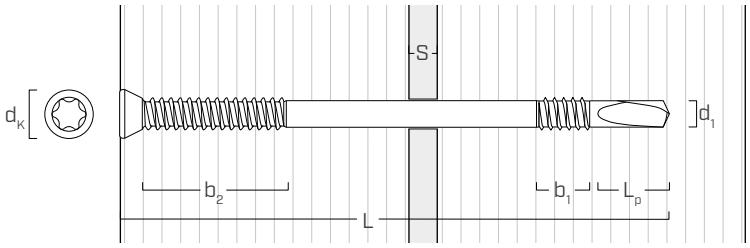
Also certified, tested and calculated for fastening standard Rothoblaas plates such as the TYP X pillar-holder.

Fastening of Rothoblaas pillar-holder with internal knife plate F70.



Rigid "knee" joint with double internal plate (LVL).

GEOMETRY AND MECHANICAL CHARACTERISTICS

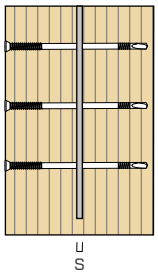


Nominal diameter	**d_1**	**[mm]**	**7,5**
Head diameter	d_K	[mm]	11,0
Tip length	L_p	[mm]	19,0
Effective length	L_{eff}	[mm]	L - 8,0
Characteristic yield moment	$M_{y,k}$	[Nm]	42,0

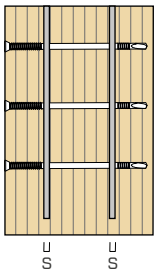
INSTALLATION

plate	s single plate [mm]	s double plate [mm]
S235 steel	10,0	8,0
S275 steel	8,0	6,0
S355 steel	6,0	5,0
ALUMINI	6,0	-
ALUMIDI	6,0	-
ALUMAXI	10,0	-

Timber-to-metal plate - timber shear joint
Recommended pressure: ≈ 40 kg
Recommended screwing: ≈ 1000 - 1500 rpm (steel plate)
≈ 600 - 1000 rpm (aluminium plate)



single plate

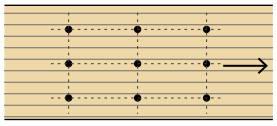


double plate

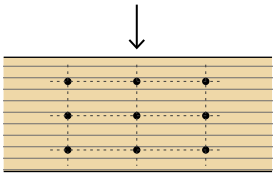
CODES AND DIMENSIONS

d_1 [mm] *[in]*	CODE	L [mm]	L *[in]*	b_2 [mm]	b_1 [mm]	pcs
7,5 *0.30* TX 40	SBD7555	55	*2 3/16*	10	-	50
	SBD7575	75	*2 15/16*	10	8	50
	SBD7595	95	*3 3/4*	10	15	50
	SBD75115	115	*4 1/2*	10	15	50
	SBD75135	135	*5 5/16*	10	15	50
	SBD75155	155	*6 1/8*	20	15	50
	SBD75175	175	*6 7/8*	40	15	50
	SBD75195	195	*7 11/16*	40	15	50
	SBD75215	215	*8 7/16*	40	15	50
	SBD75235	235	*9 1/4*	40	15	50

MINIMUM DISTANCES FOR CONNECTORS SUBJECTED TO SHEAR STRESS[1]



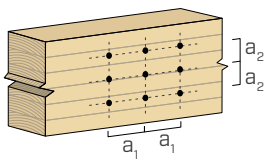
Load-to-grain angle α = 0°



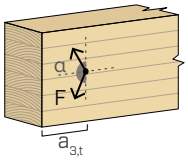
Load-to-grain angle α = 90°

d_1	[mm]		7,5		7,5
a_1	[mm]	5·d	38	3·d	23
a_2	[mm]	3·d	23	3·d	23
$a_{3,t}$	[mm]	max (7·d; 80)	80	max (7·d; 80)	80
$a_{3,c}$	[mm]	max (3.5·d; 40)	40	max (3.5·d; 40)	40
$a_{4,t}$	[mm]	3·d	23	4·d	30
$a_{4,c}$	[mm]	3·d	23	3·d	23

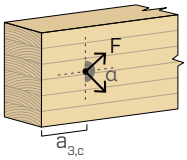
d = nominal screw diameter



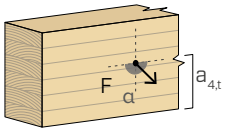
stressed end
-90° < α < 90°



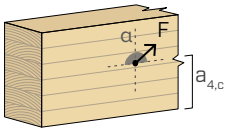
unloaded end
90° < α < 270°



stressed edge
0° < α < 180°



unload edge
180° < α < 360°



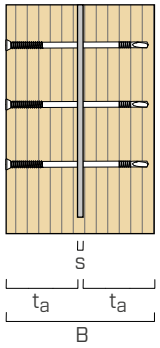
NOTES:

(1) Minimum distances in accordance with EN 1995:2014.

TIMBER-TO-STEEL AND ALUMINIUM STATIC VALUES

SHEAR $R_{v,k}$ - 1 INTERNAL PLATE

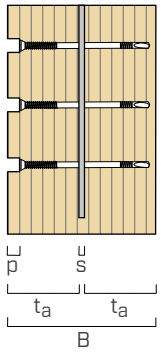
DOWEL HEAD INSERTION DEPTH 0 mm



FASTENING	SBD	[mm]	7,5x55	7,5x75	7,5x95	7,5x115	7,5x135	7,5x155	7,5x175	7,5x195	7,5x215	7,5x235
Beam width	**B**	[mm]	60	80	100	120	140	160	180	200	220	240
Head insertion depth	**p**	[mm]	0	0	0	0	0	0	0	0	0	0
Exterior wood	t_a	[mm]	27	37	47	57	67	77	87	97	107	117

$R_{v,k}$ [kN]	load-to-grain angle	**0°**	7,48	9,20	10,18	11,46	12,91	13,69	13,95	13,95	13,95	13,95
		30°	6,89	8,59	9,40	10,51	11,77	12,71	13,21	13,21	13,21	13,21
		45°	6,41	8,09	8,77	9,72	10,84	11,90	12,53	12,57	12,57	12,57
		60°	6,00	7,67	8,24	9,08	10,07	11,15	11,78	12,02	12,02	12,02
		90°	5,66	7,31	7,79	8,53	9,42	10,40	11,14	11,54	11,54	11,54

DOWEL HEAD INSERTION DEPTH 15 mm



FASTENING	SBD	[mm]	7,5x55	7,5x75	7,5x95	7,5x115	7,5x135	7,5x155	7,5x175	7,5x195	7,5x215	7,5x235
Beam width	**B**	[mm]	80	100	120	140	160	180	200	220	240	-
Head insertion depth	**p**	[mm]	15	15	15	15	15	15	15	15	15	-
Exterior wood	t_a	[mm]	37	47	57	67	77	87	97	107	117	-

$R_{v,k}$ [kN]	load-to-grain angle	**0°**	8,47	9,10	10,13	11,43	12,89	13,95	13,95	13,95	13,95	-
		30°	7,79	8,49	9,35	10,48	11,75	13,06	13,21	13,21	13,21	-
		45°	7,25	8,00	8,72	9,70	10,82	12,04	12,57	12,57	12,57	-
		60°	6,67	7,58	8,19	9,05	10,05	11,14	12,02	12,02	12,02	-
		90°	6,14	7,23	7,74	8,50	9,40	10,39	11,40	11,54	11,54	-

CORRECTIVE COEFFICIENT k_F FOR DIFFERENT DENSITIES ρ_k

Strength class	C24	GL22h	C30	GL24h	C40/GL32c	GL28h	D24	D30
ρ_k [kg/m^3]	350	370	380	385	400	425	485	530
k_F	0,91	0,96	0,99	1,00	1,02	1,05	1,12	1,17

For different densities ρ_k the timber-side design strength is calculated as: $R'_{V,d} = R_{V,d} \cdot k_F$.

EFFECTIVE NUMBER OF DOWELS n_{ef} FOR $\alpha = 0°$

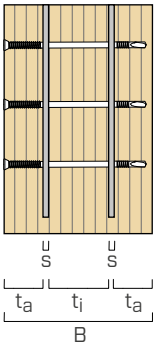
		a_1 [mm]								
	SBD no.	40	50	60	70	80	90	100	120	140
n_{ef}	2	1,49	1,58	1,65	1,72	1,78	1,83	1,88	1,97	2,00
	3	2,15	2,27	2,38	2,47	2,56	2,63	2,70	2,83	2,94
	4	2,79	2,95	3,08	3,21	3,31	3,41	3,50	3,67	3,81
	5	3,41	3,60	3,77	3,92	4,05	4,17	4,28	4,48	4,66
	6	4,01	4,24	4,44	4,62	4,77	4,92	5,05	5,28	5,49
	7	4,61	4,88	5,10	5,30	5,48	5,65	5,80	6,07	6,31

In the case of multiple dowels placed parallel to the fibres, the effective number must be taken into account: $R'_{V,d} = R_{V,d} \cdot n_{ef}$.

TIMBER-TO-STEEL AND ALUMINIUM STATIC VALUES

SHEAR $R_{v,k}$ - 2 INTERNAL PLATES

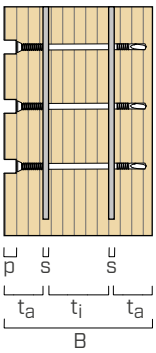
DOWEL HEAD INSERTION DEPTH 0 mm



FASTENING	SBD	[mm]	7,5x55	7,5x75	7,5x95	7,5x115	7,5x135	7,5x155	7,5x175	7,5x195	7,5x215	7,5x235
Beam width	**B**	[mm]	-	-	-	-	140	160	180	200	220	240
Head insertion depth	**p**	[mm]	-	-	-	-	0	0	0	0	0	0
Exterior wood	$\mathbf{t_a}$	[mm]	-	-	-	-	37	42	48	56	66	74
Interior wood	$\mathbf{t_i}$	[mm]	-	-	-	-	54	64	72	76	76	80

$\mathbf{R_{v,k}}$ [kN]	load-to-grain angle	**0°**	-	-	-	-	21,03	23,07	24,25	25,28	26,71	27,41
		30°	-	-	-	-	19,19	21,17	22,71	23,60	24,85	25,72
		45°	-	-	-	-	17,69	19,62	21,08	22,19	23,30	24,25
		60°	-	-	-	-	16,45	18,32	19,62	20,75	21,73	22,84
		90°	-	-	-	-	15,40	17,09	18,40	19,40	20,28	21,48

DOWEL HEAD INSERTION DEPTH 10 mm

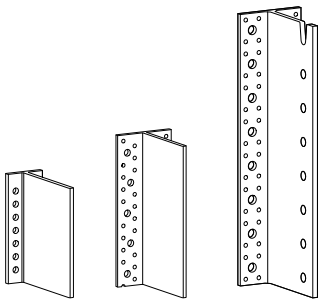


FASTENING	SBD	[mm]	7,5x55	7,5x75	7,5x95	7,5x115	7,5x135	7,5x155	7,5x175	7,5x195	7,5x215	7,5x235
Beam width	**B**	[mm]	-	-	-	140	160	180	200	220	240	-
Head insertion depth	**p**	[mm]	-	-	-	10	10	10	10	10	10	-
Exterior wood	$\mathbf{t_a}$	[mm]	-	-	-	37	42	48	56	66	74	-
Interior wood	$\mathbf{t_i}$	[mm]	-	-	-	54	64	72	76	76	80	-

$\mathbf{R_{v,k}}$ [kN]	load-to-grain angle	**0°**	-	-	-	19,31	22,20	23,23	24,02	25,28	26,42	-
		30°	-	-	-	17,49	20,25	21,86	22,52	23,60	24,59	-
		45°	-	-	-	16,01	18,65	20,36	21,26	22,19	23,07	-
		60°	-	-	-	14,78	17,32	19,02	19,94	20,75	21,78	-
		90°	-	-	-	13,75	16,07	17,88	18,68	19,40	20,52	-

ALUMINI, ALUMIDI AND ALUMAXI

For applications with ALUMINI, ALUMIDI and ALUMAXI brackets see the catalogue "PLATES AND CONNECTORS FOR TIMBER" and the MyProject software on www.rothoblaas.com.



GENERAL PRINCIPLES:

- Characteristic values according to EN 1995-1-1.
- Design values can be obtained from characteristic values as follows:

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

The coefficients γ_M and k_{mod} should be taken according to the current regulations used for the calculation.

- The values provided are calculated using 5 mm thick plates, a 6 mm thick milled cut in the timber and a single SBD dowel.
- For the calculation process a timber characteristic density ρ_k = 385 kg/m^3 has been considered.
- Sizing and verification of the timber elements and metal plates must be done separately.