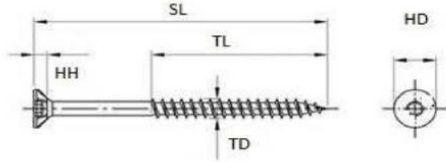


RAWLPLUG

RENDER BOARD DATA SHEET

R-UCF-A2 6.0 & 8.0MM STAINLESS STEEL SCREW 80 - 350MM LONG

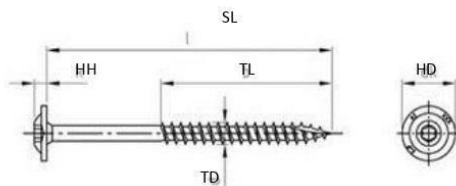


9.5MM DIAMETER I.D.
70MM DIAMETER O.D.
0.45MM THICKNESS

	6.0MM DIAMETER	8.0MM DIAMETER
DRIVE SIZE	TX25	TX40
HEAD DIAMETER (HD)	12MM	15MM
HEAD HEIGHT (HH)	3.5MM	4MM
THREAD LENGTH (TL)	70MM	80MM
TENSILE STRENGTH	50	50

MATERIAL	MEAN ULTIMATE RESISTANCE NR _{u,m}	NR _k (ETAG 014) = N1 (0.6) <1.5kN
5.5mm EXTERNAL GRADE PLYBOARD	0.41kN	0.24kN
9.0mm EXTERNAL GRADE PLYBOARD	1.05kN	0.60kN
12.0mm EXTERNAL GRADE PLYBOARD	1.63kN	0.90kN
18.0mm EXTERNAL GRADE PLYBOARD	2.11kN	1.10kN
SOFTWOOD @ 30MM EMBEDMENT	3.19kN	1.84kN
VERSAPANEL 12.0MM C P BOARD	0.99kN	0.61kN
9.0MM RCM YWALL		
12.0MM RCM YWALL	1.22kN	0.98kN
12.0MM MULTI-REND CARRIER BOARD	0.92kN	0.86kN
12.0MM KEMWELL FCB	0.95kN	0.54kN
STS CONSTRUCTION BOARD A1 12.0MM	1.13kN	0.64kN

R-PSD-60-A2 6.0 & 8.0MM STAINLESS STEEL SCREW 40 - 160MM LONG



	6.0MM DIAMETER	8.0MM DIAMETER
DRIVE SIZE	TX25	TX40
HEAD DIAMETER (HD)	15MM	20MM
HEAD HEIGHT (HH)	3.8MM	4.6MM
THREAD LENGTH (TL)		
TENSILE STRENGTH	50	50

Table 1.1 Characteristic load-carrying capacities of screws

Outer thread diameter [mm]		4.0	4.5	5.0	6.0	8.0	10.0
Characteristic yield moment $M_{y,k}$ [Nm]		1.7	3.0	3.9	6.3	13.0	24.0
Characteristic tensile strength $f_{tens,k}$ [kN]		3.1	4.0	4.8	7.1	13.0	20.0
Characteristic torsional strength $f_{tor,k}$ [Nm]		2.2	2.7	3.8	6.0	15.0	30.0

1.1 General

The minimum penetration length of screws in the load-bearing wood-based members shall be $4 \cdot d$.

The outer thread diameter of screws inserted in cross-laminated timber shall be at least 6 mm.

To connect cross-laminated timber the inner thread diameter d_1 of the screws shall be greater than the maximal width of the gaps in the layer.

1.2 Laterally loaded screws

The outer thread diameter d shall be used as effective diameter of the screw according to EN 1995-1-1.

1.3 Axially loaded screws

The axial slip modulus K_{ser} of the threaded part of a screw for the serviceability limit state per side shall be taken independent of angle α to the grain as:

$$K_{ser} = 780 \cdot d^{0.2} \cdot l_{ef}^0 \cdot e_f^4 \quad [\text{N/mm}] \quad (1.1)$$

where

d outer thread diameter of the screw [mm]

l_{ef} penetration length of the screw in the wood-based member [mm].

1.3.1 Axial withdrawal capacity

The characteristic withdrawal parameter at an angle of $30^\circ \leq \alpha \leq 90^\circ$ to the grain based on a characteristic density of the wood-based member of 350 kg/m^3 is

$f_{ax,k} = 10.0 \text{ N/mm}^2$ for screws.

For screws penetrating more than one layer of cross-laminated timber the different layers may be taken into account proportionally. In the lateral surfaces of the cross-laminated timber the screws shall be fully inserted in one layer.

1.3.2 Head pull-through capacity

The characteristic value of the head pull-through parameter for screws for a characteristic density of 350 kg/m³ of the timber and for wood-based panels like

- plywood according to EN 636 and EN 13986
- oriented Strand Board, OSB according to EN 300 and EN 13986
- particleboard according to EN 312 and EN 13986
- fibreboards according to EN 622-2, EN 622-3 and EN 13986
- cement-bonded particle board according to national provisions that apply at the building site
- solid wood panel according to national provisions that apply at the building site

with a thickness of more than 20 mm is

$$f_{head,k} = 9.4 \text{ N/mm}^2.$$

For wood-based panels a maximum characteristic density of 380 kg/m³ shall be used in equation (8.40b) of EN 1995-1-1.

For wood based panels with a thickness between 12 mm and 20 mm the characteristic value of the head pull-through parameter for screws is:

$$f_{head,k} = 8 \text{ N/mm}^2$$

For wood based panels with a thickness of less than 12 mm the characteristic head pull-through capacity for screws shall be based on a characteristic value of the head pull-through parameter of 8 N/mm², and limited to 400 N complying with the minimum thickness of the wood based panels of 1,2·d, with d as outer thread diameter and the values in Table 1.2.

Table 1.2 Minimum thickness of wood based panels

Wood based panel	Minimum thickness [mm]
Plywood	6
Fibreboards (hardboards and medium boards)	6
Oriented Strand Boards, OSB	8
Particleboards	8
Cement-bonded particle board	8
Solid wood Panels	12

In steel-to-timber connections the head pull-through capacity is not governing.

1.4 Spacing, end and edge distances of the screws and minimum thickness of the wood based material

Minimum thickness for structural members is $t = 30 \text{ mm}$ for screws with $d \leq 8 \text{ mm}$ and $t = 40 \text{ mm}$ for screws with $d = 10 \text{ mm}$.

Laterally and/or axially loaded screws

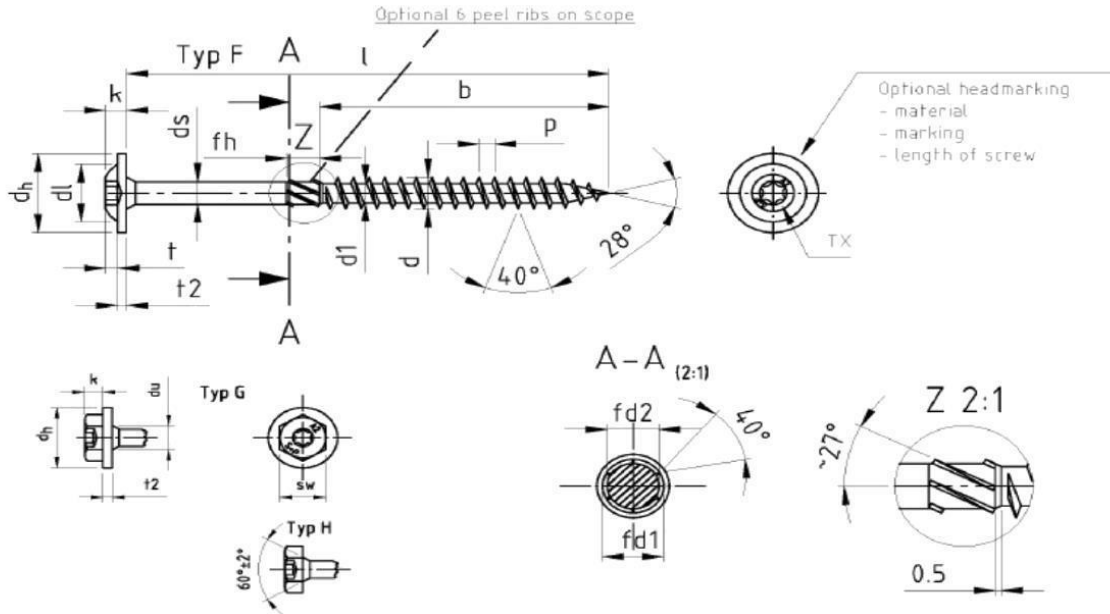
For screws in non- predrilled holes minimum spacing and distances are given in EN 1995-1-1:2004+A1:2008, clause 8.3.1.2 and Table 8.2 as for nails in non-predrilled holes.

For Douglas fir members minimum spacing and distances parallel to the grain shall be increased by 50%.

Minimum distances from loaded or unloaded ends shall be $15 \cdot d$ for screws with outer thread diameter $d \geq 8 \text{ mm}$ and timber thickness $t < 5 \cdot d$.

Minimum distances from the unloaded edge perpendicular to the grain may be reduced to $3 \cdot d$ also for timber thickness $t < 5 \cdot d$, if the spacing parallel to the grain and the end distance is at least $25 \cdot d$.

2.2 Safety in case of fire		
2.2.1	Reaction to fire	Self-tapping screws are made of steel classified as Euroclass A1 in accordance with EC decision 96/603/EC, as amended by EC decision 2000/605/EC. ^{***)}



Pan washer head timber screws with partial thread														
Description	d	d1	dh	dl	ds	k	p	du	t2	TX	sw	fd1	fd2	fh
Ø 4,0	4,0 -0,3	2,6 -0,3	12,0 ±1,0	7,0	2,84 ±0,05	3,0 +1,4	1,8 ±10%	6,0	1,5 -0,5	20	6	3,70 -0,35	2,7 -0,05	5,0 -0,2
Ø 4,5	4,5 -0,3	2,8 -0,3	13,0 ±1,0	8,0	3,11 ±0,05	3,2 +1,4	2,0 ±10%	6,5	1,5 -0,5	20	7	3,95 -0,25	2,9 -0,1	7,0 -0,2
Ø 5,0	5,0 -0,3	3,0 -0,3	14,0 ±1,0	9,0	3,54 ±0,05	3,5 +1,3	2,2 ±10%	7,0	1,5 -0,5	25	8	4,2 -0,5	3,5 -0,1	8,5 -0,6
Ø 6,0	6,0 -0,3	3,7 -0,3	15,0 ±1,0	11,0	4,25 ±0,05	4,0 +1,2	2,6 ±10%	8,0	2,0 -0,5	25	10	5,1 -0,6	4,3 -0,15	<100 5,5 -0,6 >110 10,5 -0,6
Ø 8,0	8,0 +0,2/-0,3	5,5 -0,5	20,0 -1,0	15,0	6,0 ±0,1	4,2 +1,5	3,6 ±10%	10,0	2,0 -0,5	40	12	7,3 -0,3	5,75 -0,25	10,5 -0,6
Ø 10,0	10,0 +0,2/-0,4	6,5 -0,5	25,0 -1,0	20,0	7,0 ±0,1	5,0 +1,2	4,6 ±10%	12,0	2,0 -0,5	40	15	8,8 -0,3	6,75 -0,25	10,5 -0,6

l -1/2 IT17	25	30	35	40	45	50	55	60	65	70	75	80	90	100	120-160	180-300	300-375
Ø 4,0 b ±1	18	18	24	24	30	30	36	36	36	42	-	-	-	-	-	-	-
Ø 4,5 b ±1	-	18	24	24	30	30	36	36	36	42	48	48	-	-	-	-	-
Ø 5,0 b ±1	-	20	24	24	30	30	36	36	36	42	48	48	54	60	-	-	-
Ø 6,0 b ±1	-	-	24	24	30	30	36	36	36	42	48	48	54	70	70	70	-
Ø 8,0 b ±1	-	-	-	32	37	47	50	50	50	50	50	72	80	80	80	80	80
Ø 10,0 b ±1	-	-	-	-	-	-	50	55	55	55	55	55	55	55	80	105	105