Guardian metal pressure plates

SP 40 metal plate range

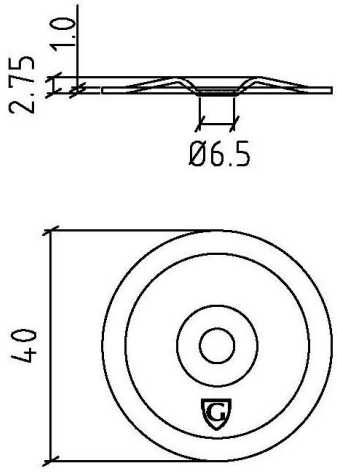

Fig. 8
SP-40-D, F, DD, FD

SP 40 metal plate range

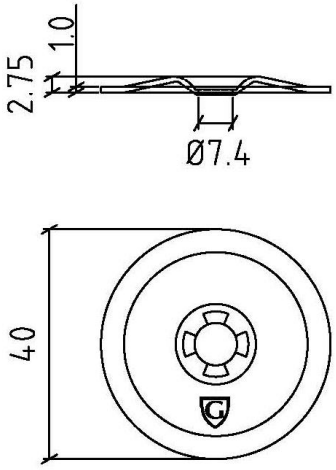

Fig. 9
SP-40-LBS

SP 50 metal plate range

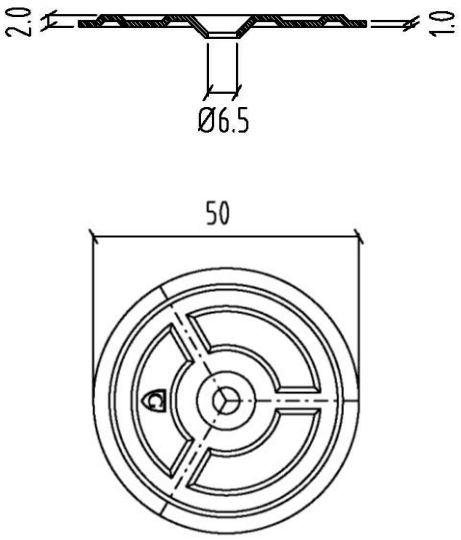

Fig. 10
SP-50-D, F, S

SP 50 barbed metal plate range

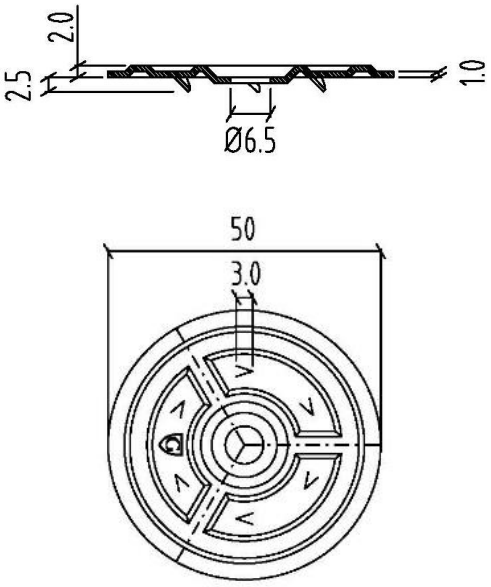

Fig. 11
SPB-50-S

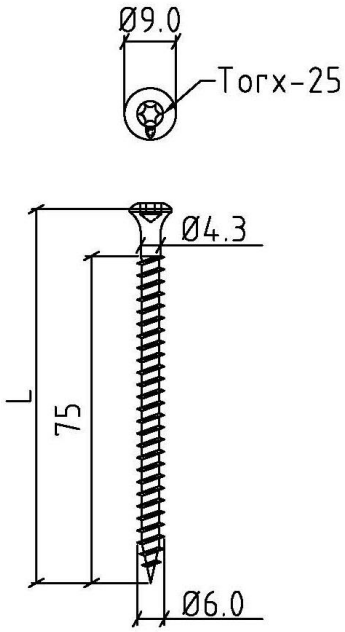

Fig. 26
LBS 6.0 screw for lightweight concrete, concrete and wooden substrates
LBS-S 6.0 Stainless screw for lightweight concrete and wooden substrates

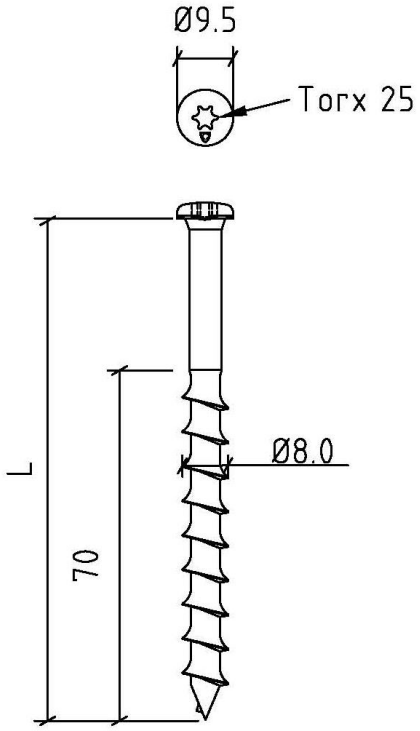

Fig. 27
LBS 8.0 screw for lightweight concrete
LBS-S 8.0 Stainless screw for lightweight concrete

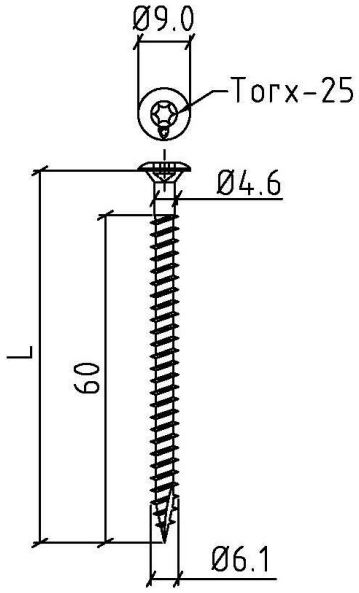

Fig. 28
HD 6.1 Screw for lightweight concrete, concrete and wooden substrates

Annex 2

Performance of Guardian Fastening system on different substrates

Characteristic values are calculated from the following formula according to EAD-030351-00-0402 and CEN/TS-17659:

R_k: α (X_m – (k x s))

where: R_k = characteristic y values of axial load resistance

α = corr. factor for tested substrate spec. compared with nominal substrate spec.

X_m = mean axial pull-out load for 10 specimens

k = 1,92 (according to Table D1 in EN-1990:2002)

s = standard deviation

Table 2: Concrete substrate [1)]

Fastener	Substrate	R_k: Characteristic values of axial load resistance (kN)
GUARDIAN CS 6.1 / ACS-6.1	C25-C30	4.28
GUARDIAN BNRF 5.5	C25-C30	1.79
GUARDIAN BN 5.6	C25-C30	1.92
GUARDIAN CP & CPN (Polypropylene)	C25-C30	1.57
GUARDIAN HD 6.1	C25-C30	4.83
GUARDIAN LBS 6.0	C20-C25	2.92
GUARDIAN LBS 6.0	C25-C30	3.26
GUARDIAN CS-S 6.1	C25-C30	2.92
GUARDIAN CS-S 6.1	C32-C40	3.29
GUARDIAN CS-S 6.1	C40-C50	3.69

[1)] See clause 2 regarding hole diameter and drill depth

Table 3: Light weight concrete substrate [2)]

Fastener	Substrate	R_k: Characteristic values of axial load resistance (kN)
GUARDIAN LBS 6.0	Density 600 kg/m3	2.07
GUARDIAN LBS 8.0	Density 450 kg/m3	0.93
GUARDIAN LBS 8.0	Density 550 kg/m3	1.44
GUARDIAN HD 6.1	Density 600 kg/m3	1.36
GUARDIAN LBS-S 6.0	Density 450 kg/m3	1.34

[2)] Autoclaved aereated concrete units according to EN 12602:2016

Table 4: Profiled steel sheets substrate [3)]

Table 6: Pullover test of washer

Washer	Fastener[13] Guardian															R_k: Characteristic values of axial load resistance	Durability according to EAD 030351-00-0402
	ACS 6.1	BS 4.8	BS 5.5	BS 6.1	BS 6.8	BSHD 4.8	BSRF 4.8	CS 6.1 / CS S 6.1	DBT 4.8(-A)	DBT-S-4.8(-A)	HD 6.1	LBS 6.0 / LBS S 6.0	LBS-8.0 / LBS S 8.0	PS 4.8	TS 5.2		
SP-40 – D/F/DD/FD	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	3.88	Approved
SP-40-LBS	-												X			4.29	Approved
SP-50-D. F. S	-	X	X	X	X	X	X	X	-	-	X	X	X	X	X	4.83	Approved
SPB-50-S	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	4.83	Approved
SP-70-D. F. S	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	2.88	Approved
SP 8240-D/F/S	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	5.30	Approved
SPA 8240-D/F	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-	5.00	Approved
STBS	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	3.68	Approved
Sleeve R23 – STBT	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	1.78	Approved
Sleeve R23 – STBS7T15	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	1.78	Approved
Guardian screw-STBS7T15	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	3.68	Approved
STBST	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	3.68	Approved
Sarnabar + R23	X	X	X	X	X	X	X	X	-	-	X	X	-	X	X	1.78	Approved
Sarnabar + Guardian screw	-	X	X	X	X	X	X	X	X	X	X	X	-	X	X	5.00	Approved
GWSP (*)-80-F2E	-	-	X	X	X	-	-	X	-	-	-	X	-	-	X	2.48	Approved
Sleeve GWT + GWSP (*)-80-F4E	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	3.17	Approved
Sleeve R 50	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	1.58	Approved
Sleeve R 48	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	1.58	Approved
Sleeve RPA 48	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	3.00	Approved
Sleeve RB 48	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	1.58	Approved
Sleeve RBPA 48	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	3.00	Approved
Sleeve RBS 50	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	1.58	Approved
Sleeve R 75	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	1.58	Approved
Sleeve TBPP 8040	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	1.58	Approved
Sleeve TBPA 8040	-	X	X	X	X	X	X	X	-	-	X	X	-	X	X	2.52	Approved
PP 45	-	X	X	X	-	X	X	X	-	-	-	X	-	X	X	2.50	Approved
Sleeve ASTL-50	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.58	Approved
Sleeve ASTL 48 / ASTL 50	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.58	Approved
Sleeve ASTL 75	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.58	Approved
Sleeve R50-LN	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	1.58	Approved
Sleeve R48-LN	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	1.58	Approved
Sleeve R75-LN	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	1.58	Approved

[13] Obtained values from the axial load test in different substrates (table 2 - 5) and the pullover test (table 6) of washers/sleeves are compared and the lowest of the two gives the characteristic value for the fastener / sleeve, washer combination of the application.