

Guardian Fasteners for concrete

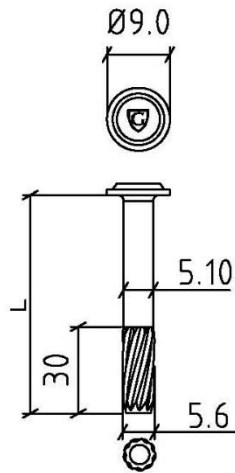


Fig. 21
BN 5.6 Concrete nail

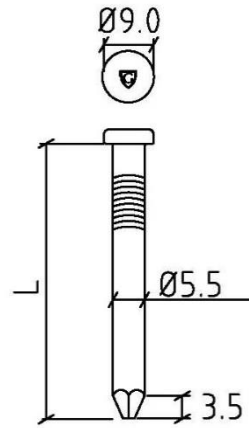


Fig. 22
BNRF 5.5 Stainless concrete nail

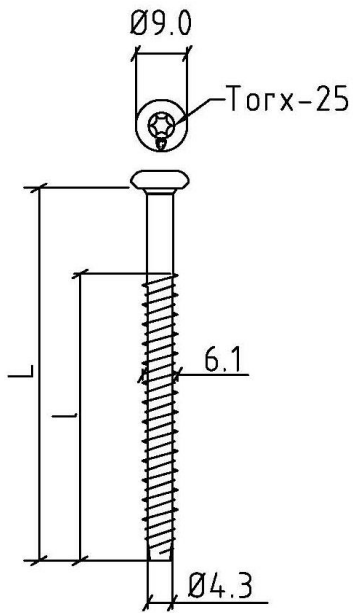


Fig. 23
CS 6.1 Concrete screw (with flat or sharp point)
CS-S 6.1 Stainless Concrete screw

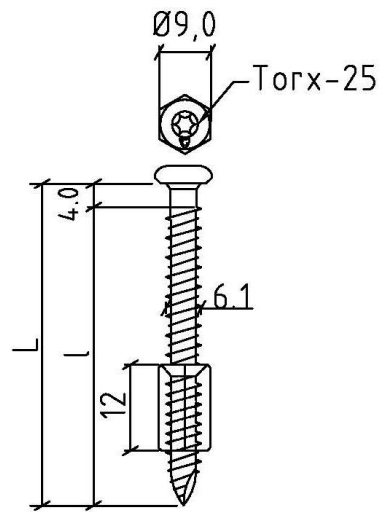


Fig. 24
ACS 6.1 Adjustable concrete screw
(used together with tube washer ASTL versions)

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:

$$R_k: \alpha (X_m - (k \times s))$$

where: R_k = characteristic 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 B NRF 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/m ³	2.07
GUARDIAN LBS 8.0	Density 450 kg/m ³	0.93
GUARDIAN LBS 8.0	Density 550 kg/m ³	1.44
GUARDIAN HD 6.1	Density 600 kg/m ³	1.36
GUARDIAN LBS-S 6.0	Density 450 kg/m ³	1.34

²⁾ Autoclaved aerated 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.