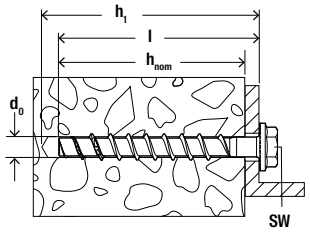
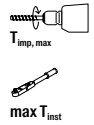
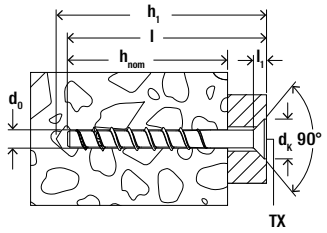
fischer UltraCut FBS II 8-14 GVZ/CP

FBS II US
(gvz, CP)



FBS II SK
(gvz, CP)





UltraCut FBS II		8			10			12	14
d_0	[mm]	8	8	8	10	10	10	12	14
h_{nom1}	[mm]	50	50	50	55	55	55	60	65
h_{nom2}	[mm]	–	–	–	65	–	–	75	85
h_{nom3}	[mm]	65	–	–	85	–	–	100	115
$h_1 \geq$	[mm]	l + 10	l + 10	l + 10	l + 10	l + 10	l + 10	l + 10	l + 15
l_1	[mm]	6	6	6	7	7	7	–	–
d_K	[mm]	20	20	20	23	23	23	–	–
$T_{imp, max}$	[Nm]	600	80	65	650	80	65	650	650
max T_{inst}	[Nm]	65	20	4	100	20	8	150	250
SW	[-]	13	13	13	15	15	15	17	21
TX	[-]	40 (SK/US)	40 (SK/US)	40 (SK/US)	50 (SK)	50 (SK)	50 (SK)	–	–

fischer stands for

Fixing Systems
fischertechnik
Consulting
Electronic Solutions

fischerwerke GmbH & Co. KG
Klaus-Fischer-Straße 1
72178 Waldachtal
Germany

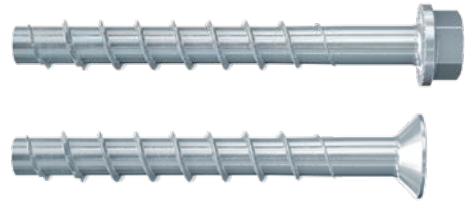
T +49 7443 12 - 0
F +49 7443 12 - 8297

info@fischer.de
www.fischer-international.com

0018159 (02) - 07/2025 [bis] - Printed in Germany

fischer

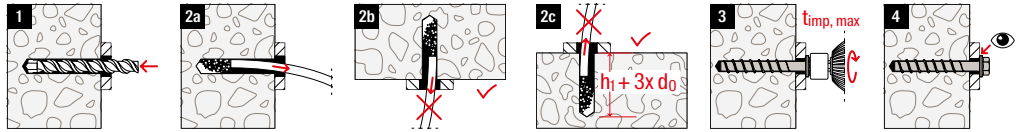
UltraCut
FBS II 8-14 GVZ/CP



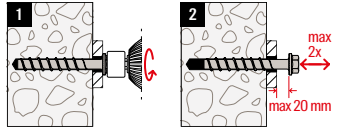
EN Operating instructions

Post-installed fastening in cracked or uncracked concrete (Option 1, Seismic Performance Category C1 and C2) acc. ETA-15/0352; 15; EAD 330232-01-0601; DoP: 0227; www.fischer.de/sdb; 2873; fischerwerke GmbH &Co. KG, Klaus-Fischer-Str.1, 72178 Waldachtal

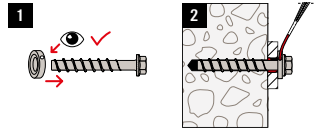
1.1



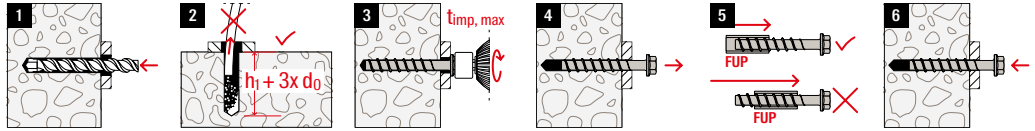
1.2



1.3

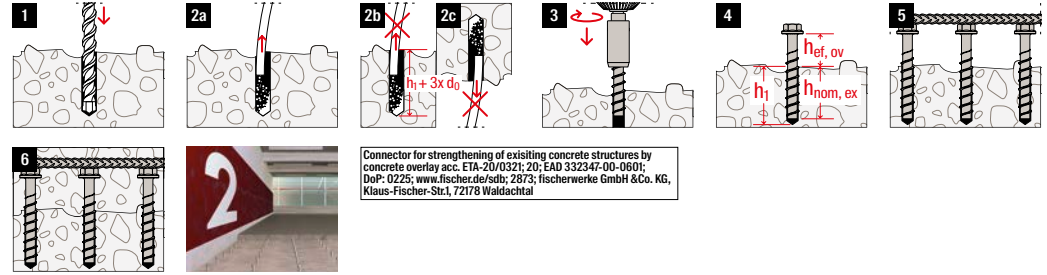


2.0



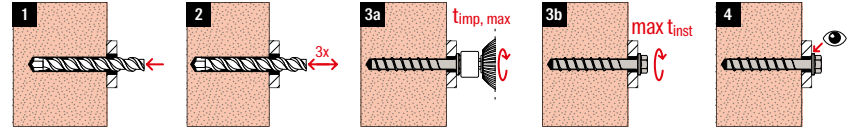
aBG
Z-21.8-2049

3.0

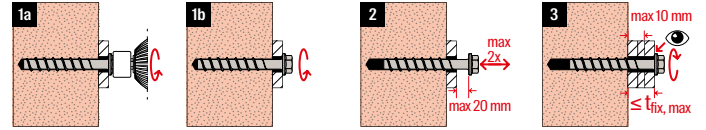


Connector for strengthening of exisiting concrete structures by concrete overlay acc. ETA-20/0321; 20; EAD 332347-00-0601; DoP: 0225; www.fischer.de/sdb; 2873; fischerwerke GmbH &Co. KG, Klaus-Fischer-Str.1, 72178 Waldachtal

4.1



4.2

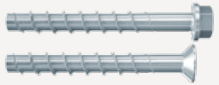


Screw anchors for use in masonry bricks made of clay, calcium silicat, solid brick masonry, and hollow brick masonry acc. ETA-20/0134; 22; EAD 330460-00-0604; DoP: 0311; www.fischer.de/sdb; 2873; fischerwerke GmbH &Co. KG, Klaus-Fischer-Str.1, 72178 Waldachtal

Performance parameter according to ETA-15/0352




$N_{Rk,p,uncr} \geq N^0_{Rk,c}$; ψ_c=1,12-1,58; γ_{inst}=1,0; $k_{cr,N}$=7,7; $k_{ucr,N}$=11; $c_{cr,N}$=1,5 x h_{ef}; $N^0_{Rk,sp}$=min ($N^0_{Rk,c}$; $N_{RK,p}$); $c_{cr,sp}$=1,5 x h_{ef}; k_7=1; α_{gap}=0,5-1,0; $A_5 \geq 8\%$
Durability: (gvz) dry internal conditions
Resistance to fire: Class A1



	Characteristic resistance to tension load (static and quasi-static loading)						Characteristic resistance to shear load (static and quasi-static loading)			Displacements				Characteristic resistance and displacements for seismic performance categories C1 or C2										Resistance to fire			
	$N_{Rk,s}$ [kN]	$N_{Rk,p,cr}$ [kN]	h_{ef} [mm]	c_{min} [mm]	s_{min} [mm]	h_{min} [mm]	$V^0_{Rk,s}$ [kN]	$M^0_{Rk,s}$ [Nm]	k_8 [-]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]	$N_{Rk,s,C1}$ [kN]	$N_{Rk,p,C1}$ [kN]	$N_{Rk,s,C2}$ [kN]	$N_{Rk,p,C2}$ [kN]	$V_{Rk,s,C1}$ [kN]	$V_{Rk,s,C2}$ [kN]	$\delta_{N,C2}$ (DLS) [mm]	$\delta_{N,C2}$ (ULS) [mm]	$\delta_{V,C2}$ (DLS) [mm]	$\delta_{V,C2}$ (ULS) [mm]	$N_{Rk,s,fi}$ [kN]	$N_{Rk,p,fi}$ [kN]	$V_{Rk,s,fi}$ [kN]	$M^0_{Rk,s,fi}$ [Nm]
D8 - h_{nom} = 50 (US, S) - GVZ/CP	35	6	40	35	35	100	13,1	51	1	0,5	1,3	1,4	2,0	–	–	–	–	–	–	–	–	–	–	1,04-2,33	1,2-1,5	1,04-2,33	1,17-2,62
D8 - h_{nom} = 65 (US, S) - GVZ/CP	35	12	52	35	35	120	19,0	51	2	0,9	1,0	1,4	2,1	35	12	35	2,1	11,4	13,3	0,5	1,7	1,6	3,9	1,04-2,33	2,4-3,0	1,04-2,33	1,17-2,62
D10 - h_{nom} = 55 (US, S) - GVZ/CP	55	9	43	40	40	100	29,4	95	1	0,7	0,7	3,2	4,9	–	–	–	–	–	–	–	–	–	–	1,64-3,45	1,8-2,3	1,64-3,45	2,34-4,92
D10 - h_{nom} = 65 (US, S) - GVZ/CP	55	12	51	40	40	120	29,4	95	2	0,7	0,7	3,2	4,9	–	–	–	–	–	–	–	–	–	–	1,64-3,45	2,4-3,0	1,64-3,45	2,34-4,92
D10 - h_{nom} = 85 (US, S) - GVZ/CP	55	≥ $N^0_{Rk,c}$	68	40	40	140	34,9	95	2	0,8	0,8	3,2	4,9	55	≥ $N^0_{Rk,c}$	55	6,0	22,3	20,4	0,8	2,8	2,7	7,1	1,64-3,45	4,0-5,0	1,64-3,45	2,34-4,92
D12 - h_{nom} = 60 (US, S) - GVZ/CP	76	≥ $N^0_{Rk,c}$	47	50	50	110	31,9	165	2	0,7	1,3	2,5	3,8	–	–	–	–	–	–	–	–	–	–	2,2-4,62	2,3-2,9	2,2-4,62	3,73-7,83
D12 - h_{nom} = 75 (US, S) - GVZ/CP	76	≥ $N^0_{Rk,c}$	60	50	50	130	31,9	165	2	0,9	0,9	2,5	3,8	–	–	–	–	–	–	–	–	–	–	2,2-4,62	3,3-4,2	2,2-4,62	3,73-7,83
D12 - h_{nom} = 100 (US, S) - GVZ/CP	76	≥ $N^0_{Rk,c}$	81	50	50	150	42,7	165	2	0,8	0,8	3,4	5,1	76	≥ $N^0_{Rk,c}$	76	8,9	26,9	29,9	0,9	2,7	3,1	5,3	2,2-4,62	5,2-6,6	2,2-4,62	3,73-7,83
D14 - h_{nom} = 65 (US, S) - GVZ/CP	103	≥ $N^0_{Rk,c}$	50	60	60	120	46,5	269	2	0,8	1,1	2,8	4,2	–	–	–	–	–	–	–	–	–	–	3,08-6,46	2,5-3,2	3,08-6,46	6,14-12,89
D14 - h_{nom} = 85 (US, S) - GVZ/CP	103	≥ $N^0_{Rk,c}$	67	60	60	140	46,5	269	2	1,0	1,0	2,8	4,2	–	–	–	–	–	–	–	–	–	–	3,08-6,46	3,9-4,9	3,08-6,46	6,14-12,89
D14 - h_{nom} = 115 (US, S) - GVZ/CP	103	≥ $N^0_{Rk,c}$	93	60	60	180	61,7	269	2	0,8	1,1	5,4	8,1	103	≥ $N^0_{Rk,c}$	103	17,1	38,3	35,2	1,3	5,0	4,1	8,7	3,08-6,46	6,5-8,1	3,08-6,46	6,14-12,89
D8 - h_{nom} = 50 (SK, US TX, S TX) - GVZ/CP	35	6	40	35	35	100	13,1	51	1	0,5	1,3	1,4	2,0	–	–	–	–	–	–	–	–	–	–	0,99-2,12	1,2-1,5	0,99-2,12	1,17-2,62
D8 - h_{nom} = 65 (SK, US TX, S TX) - GVZ/CP	35	12	52	35	35	120	19,0	51	2	0,9	1,0	1,4	2,1	35	12	35	2,1	11,4	13,3	0,5	1,7	1,6	3,9	0,99-2,12	2,4-3,0	0,99-2,12	1,17-2,62
D10 - h_{nom} = 55 (SK, US TX, S TX) - GVZ/CP	55	9	43	40	40	100	29,4	95	1	0,7	0,7	3,2	4,9	–	–	–	–	–	–	–	–	–	–	1,21-2,96	1,8-2,3	1,21-2,96	2,34-4,92
D10 - h_{nom} = 65 (SK, US TX, S TX) - GVZ/CP	55	12	51	40	40	120	29,4	95	2	0,7	0,7	3,2	4,9	–	–	–	–	–	–	–	–	–	–	1,21-2,96	2,4-3,0	1,21-2,96	2,34-4,92
D10 - h_{nom} = 85 (SK, US TX, S TX) - GVZ/CP	55	≥ $N^0_{Rk,c}$	68	40	40	140	34,9	95	2	0,8	0,8	3,2	4,9	55	≥ $N^0_{Rk,c}$	55	6,0	22,3	20,4	0,8	2,8	2,7	7,1	1,21-2,96	4,0-5,0	1,21-2,96	2,34-4,92
D12 - h_{nom} = 60 (SK, US TX, S TX) - GVZ/CP	76	≥ $N^0_{Rk,c}$	47	50	50	110	31,9	165	2	0,7	1,3	2,5	3,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–
D12 - h_{nom} = 75 (SK, US TX, S TX) - GVZ/CP	76	≥ $N^0_{Rk,c}$	60	50	50	130	31,9	165	2	0,9	0,9	2,5	3,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–
D12 - h_{nom} = 100 (SK, US TX, S TX) - GVZ/CP	76	≥ $N^0_{Rk,c}$	81	50	50	150	42,7	165	2	0,8	0,8	3,4	5,1	76	≥ $N^0_{Rk,c}$	76	8,9	26,9	29,9	0,9	2,7	3,1	5,3	–	–	–	–
D14 - h_{nom} = 65 (SK, US TX, S TX) - GVZ/CP	103	≥ $N^0_{Rk,c}$	50	60	60	120	46,5	269	2	0,8	1,1	2,8	4,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
D14 - h_{nom} = 85 (SK, US TX, S TX) - GVZ/CP	103	≥ $N^0_{Rk,c}$	67	60	60	140	46,5	269	2	1,0	1,0	2,8	4,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
D14 - h_{nom} = 115 (SK, US TX, S TX) - GVZ/CP	103	≥ $N^0_{Rk,c}$	93	60	60	180	61,7	269	2	0,8	1,1	5,4	8,1	103	≥ $N^0_{Rk,c}$	103	17,1	38,3	35,2	1,3	5,0	4,1	8,7	–	–	–	–

Performance parameter according to ETA-20/0321



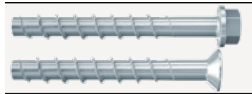

$\psi_{c,ex}$=1,12-1,58; γ_{inst}=1,0; $k_{cr,N,ex}$=7,7; $k_{ucr,N,ex}$=11; $c_{cr,N,ex}$=1,5 x h_{ef}; $k_{cr,N,ov}$=8,9; $k_{ucr,N,ov}$=12,7; $c_{cr,N,ov}$=1,5 x $h_{ef,ov}$; $h_{ef,ov}$=40-(L-$h_{nom,ex}$-2 R_t); $c_{cr,sp,ov}$=3 x $h_{ef,ov}$; $c_{min,ov}$=10+c_{nom}; α_{ki}=0,8; $h_{min,ov}$=$h_{nom,ov}$+c_{nom}; α_{k2}=1
Resistance to fire: Class A1

	Existing Concrete						Concrete Overlay					
	$h_{ef,ex}$ [mm]	$N_{Rk,s,ex}$ [kN]	$N_{Rk,p,ex}$ [kN]	$c_{min,ex}$ [mm]	$s_{min,ex}$ [mm]	$h_{min,ex}$ [mm]	$N_{Rk,s,ov}$ [kN]	A_h [mm²]	t_h [mm]	$s_{min,ov}$ [mm]	f_{yk} [N/mm²]	A_s [mm²]
D8 - h_{nom} = 50 (US,US TX) - GVZ	40	35	6	35	35	100	35	205	8,4	40	800	43,0
D8 - h_{nom} = 65 (US,US TX) - GVZ	52	35	12	35	35	120	35	205	8,4	40	800	43,0
D10 - h_{nom} = 55 (US,US TX) - GVZ	43	55	9	40	40	100	55	255	9,9	40	750	69,4
D10 - h_{nom} = 65 (US, US TX) - GVZ	51	55	12	40	40	120	55	255	9,9	40	750	69,4
D10 - h_{nom} = 85 (US, US TX) - GVZ	68	55	≥ $N^0_{Rk,c,ex}$	40	40	140	55	255	9,9	40	750	69,4
D12 - h_{nom} = 60 (US, US TX) - GVZ	47	76	≥ $N^0_{Rk,c,ex}$	50	50	110	76	308	10,3	45	750	100,3
D12 - h_{nom} = 75 (US, US TX) - GVZ	60	76	≥ $N^0_{Rk,c,ex}$	50	50	130	76	308	10,3	45	750	100,3
D12 - h_{nom} = 100 (US, US TX) - GVZ	81	76	≥ $N^0_{Rk,c,ex}$	50	50	150	76	308	10,3	45	750	100,3
D14 - h_{nom} = 65 (US,US TX) - GVZ	50	103	≥ $N^0_{Rk,c,ex}$	60	60	120	103	472	11,5	55	750	138,9
D14 - h_{nom} = 85 (US, US TX) - GVZ	67	103	≥ $N^0_{Rk,c,ex}$	60	60	140	103	472	11,5	55	750	138,9
D14 - h_{nom} = 115 (US, US TX) - GVZ	93	103	≥ $N^0_{Rk,c,ex}$	60	60	180	103	472	11,5	55	750	138,9

Performance parameter according to ETA-20/0134



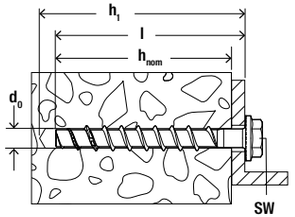

$V_{Rk,s,fi}$=$N_{Rk,s,fi}$; $c_{min,fi}$=xy; $s_{min,fi}$=xy
Durability: (gvz) dry internal conditions
Resistance to fire: Class A1



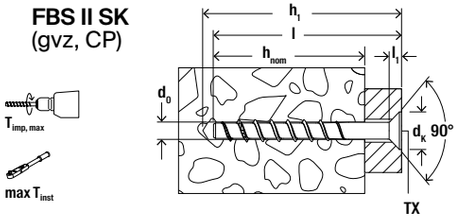
	Characteristic resistance																						Displacements				Resistance to fire		
	$N_{Rk,s}$ [kN]	$V_{Rk,s}$ [kN]	$M^0_{Rk,s}$ [Nm]	$N_{Rk,p}$ [kN]	$N_{Rk,b}$ [kN]	$N_{Rk,p,c}$ [kN]	$N_{Rk,b,c}$ [kN]	$N_{Rk}{}^g$ [kN]	$\alpha_{g,N}$ [-]	$V_{Rk,b}$ [kN]	$V_{Rk,cII}$ [kN]	$V_{Rk,c,\perp}$ [kN]	$V^g_{Rk,b}$ [kN]	$V^g_{Rk,cII}$ [kN]	$V^g_{Rk,c,\perp}$ [kN]	$\alpha_{g,V}$ [-]	c_{cr} [mm]	c_{min} [mm]	s_{cr} [mm]	$s_{min,II}$ [mm]	$s_{min,\perp}$ [mm]	h_{min} [mm]	X [-]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]	$N_{Rk,s,fi}$ [kN]	$N_{Rk,p,fi}$ [kN]	$M^0_{Rk,s,fi}$ [Nm]
D8 - h_{nom} ≥ 50 (US/S/SK/USTx/STx) - GVZ/CP	35	13,1	51	0,8-2,5	0,8-2,5	0,8-2,5	0,8-2,5	$\alpha_{g,N}$ x N_{Rk}	2	1,4-5,8	2,3-5,8	1,4-2,4	$\alpha_{g,V}$ x V_{Rk}	$\alpha_{g,V}$ x V_{RkII}	$\alpha_{g,V}$ x $V_{Rk,\perp}$	1,75	1,5xh_{nom}	60	3xh_{nom}	80	80	108-175	1,3	0,15-0,2	0,3-0,4	0,75-4,5	1,13-6,75	0,5-1,1	1-1,3	0,8-1,5
D10 - h_{nom} ≥ 55 (US/S/SK/USTx/STx) - GVZ/CP	55	29,4	95	0,8-2,6	0,8-2,6	0,8-2,6	0,8-2,6	$\alpha_{g,N}$ x N_{Rk}	2	1,3-6,2	2,7-6,2	1,3-3,0	$\alpha_{g,V}$ x V_{Rk}	$\alpha_{g,V}$ x V_{RkII}	$\alpha_{g,V}$ x $V_{Rk,\perp}$	1,75	1,5xh_{nom}	70	3xh_{nom}	80	80	108-175	1,3	0,15-0,3	0,3-0,6	0,5-1,25	0,75-1,88	1,0-1,8	1,13	1,7-3,1

fischer UltraCut FBS II 8-14 GVZ/CP

FBS II US
(gvz, CP)



FBS II SK
(gvz, CP)

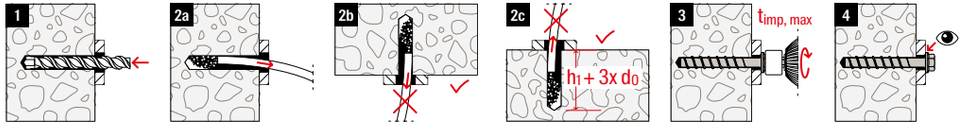


UltraCut FBS II		8			10			12	14
d_0	[mm]	8	8	8	10	10	10	12	14
h_{nom1}	[mm]	50	50	50	55	55	55	60	65
h_{nom2}	[mm]	–	–	–	65	–	–	75	85
h_{nom3}	[mm]	65	–	–	85	–	–	100	115
$h_1 \geq$	[mm]	l + 10	l + 10	l + 10	l + 10	l + 10	l + 10	l + 10	l + 15
l_1	[mm]	6	6	6	7	7	7	–	–
d_K	[mm]	20	20	20	23	23	23	–	–
$T_{imp, max}$	[Nm]	600	80	65	650	80	65	650	650
max T_{inst}	[Nm]	65	20	4	100	20	8	150	250
SW	[-]	13	13	13	15	15	15	17	21
TX	[-]	40 (SK/US)	40 (SK/US)	40 (SK/US)	50 (SK)	50 (SK)	50 (SK)	–	–

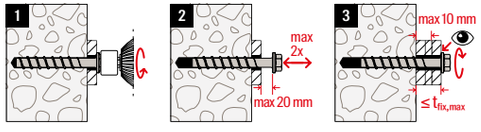
CE ETA

Post-installed fastening in cracked or uncracked concrete (Option 1, Seismic Performance Category C1 and C2) acc. ETA-15/0352; 15; EAD 330232-01-0601; DoP: 0227; www.fischer.de/sdb; 2873; fischerwerke GmbH &Co. KG, Klaus-Fischer-Str.1, 72178 Waldachtal

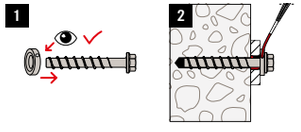
1.1



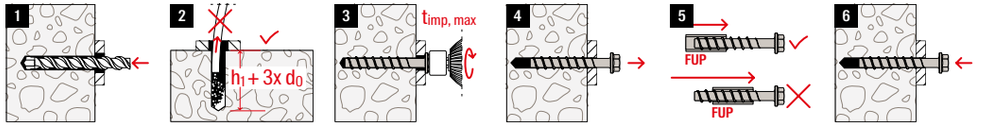
1.2

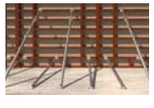


1.3



2.0





aBG
Z-21.8-2049

fischerwerke GmbH & Co. KG
Klaus-Fischer-Straße 1
72178 Waldachtal
Germany

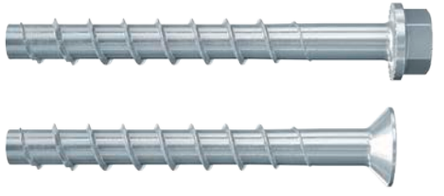
T +49 7443 12 - 0
F +49 7443 12 - 8297

info@fischer.de
www.fischer-international.com

0018/0159 (02) 07/2025 [bbs] - Printed in Germany

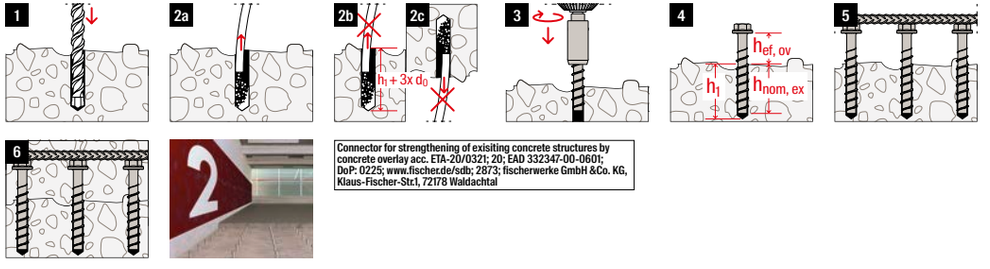
fischer

UltraCut
FBS II 8-14 GVZ/CP



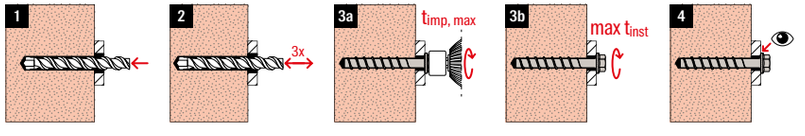
EN Operating instructions

3.0

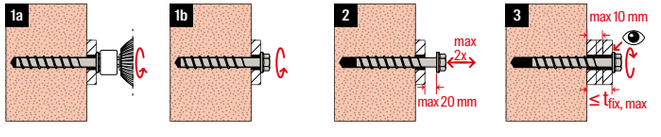


Connector for strengthening of exisiting concrete structures by concrete overlay acc. ETA-20/0321; 20; EAD 332347-00-0601; DoP: 0225; www.fischer.de/sdb; 2873; fischerwerke GmbH &Co. KG, Klaus-Fischer-Str.1, 72178 Waldachtal

4.1



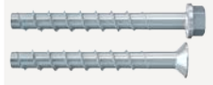
4.2



Screw anchors for use in masonry bricks made of clay, calcium silicat, solid brick masonry, and hollow brick masonry acc. ETA-20/0134; 22; EAD 330460-00-0604; DoP: 0311; www.fischer.de/sdb; 2873; fischerwerke GmbH &Co. KG, Klaus-Fischer-Str.1, 72178 Waldachtal

Performance parameter according to ETA-15/0352

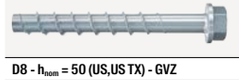
$N_{Rk,p,ucr} \geq N^0_{Rk,c}$; ψ_c=1,12-1,58; γ_{inst}=1,0; $k_{cr,N}$=7,7; $k_{ucr,N}$=11; $c_{cr,N}$=1,5 x h_{ef}; $N^0_{Rk,sp}$=min ($N^0_{Rk,c}$; $N_{RK,p}$); $c_{cr,sp}$=1,5 x h_{ef}; k_7=1; α_{gap}=0,5-1,0; $A_5 \geq 8\%$
Durability: (gvz) dry internal conditions
Resistance to fire: Class A1



	Characteristic resistance to tension load (static and quasi-static loading)						Characteristic resistance to shear load (static and quasi-static loading)			Displacements				Characteristic resistance and displacements for seismic performance categories C1 or C2										Resistance to fire			
	$N_{Rk,s}$ [kN]	$N_{Rk,p,cr}$ [kN]	h_{ef} [mm]	c_{min} [mm]	s_{min} [mm]	h_{min} [mm]	$V^0_{Rk,s}$ [kN]	$M^0_{Rk,s}$ [Nm]	k_8 [-]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]	$N_{Rk,s,C1}$ [kN]	$N_{Rk,p,C1}$ [kN]	$N_{Rk,s,C2}$ [kN]	$N_{Rk,p,C2}$ [kN]	$V_{Rk,s,C1}$ [kN]	$V_{Rk,s,C2}$ [kN]	$\delta_{N,C2}$ (DLS) [mm]	$\delta_{N,C2}$ (ULS) [mm]	$\delta_{V,C2}$ (DLS) [mm]	$\delta_{V,C2}$ (ULS) [mm]	$N_{Rk,s,fi}$ [kN]	$N_{Rk,p,fi}$ [kN]	$V_{Rk,s,fi}$ [kN]	$M^0_{Rk,s,fi}$ [Nm]
D8 - h_{nom} = 50 (US, S) - GVZ/CP	35	6	40	35	35	100	13,1	51	1	0,5	1,3	1,4	2,0	–	–	–	–	–	–	–	–	–	–	1,04-2,33	1,2-1,5	1,04-2,33	1,17-2,62
D8 - h_{nom} = 65 (US, S) - GVZ/CP	35	12	52	35	35	120	19,0	51	2	0,9	1,0	1,4	2,1	35	12	35	2,1	11,4	13,3	0,5	1,7	1,6	3,9	1,04-2,33	2,4-3,0	1,04-2,33	1,17-2,62
D10 - h_{nom} = 55 (US, S) - GVZ/CP	55	9	43	40	40	100	29,4	95	1	0,7	0,7	3,2	4,9	–	–	–	–	–	–	–	–	–	–	1,64-3,45	1,8-2,3	1,64-3,45	2,34-4,92
D10 - h_{nom} = 65 (US, S) - GVZ/CP	55	12	51	40	40	120	29,4	95	2	0,7	0,7	3,2	4,9	–	–	–	–	–	–	–	–	–	–	1,64-3,45	2,4-3,0	1,64-3,45	2,34-4,92
D10 - h_{nom} = 85 (US, S) - GVZ/CP	55	$\geq N^0_{Rk,c}$	68	40	40	140	34,9	95	2	0,8	0,8	3,2	4,9	55	$\geq N^0_{Rk,c}$	55	6,0	22,3	20,4	0,8	2,8	2,7	7,1	1,64-3,45	4,0-5,0	1,64-3,45	2,34-4,92
D12 - h_{nom} = 60 (US, S) - GVZ/CP	76	$\geq N^0_{Rk,c}$	47	50	50	110	31,9	165	2	0,7	1,3	2,5	3,8	–	–	–	–	–	–	–	–	–	–	2,2-4,62	2,3-2,9	2,2-4,62	3,73-7,83
D12 - h_{nom} = 75 (US, S) - GVZ/CP	76	$\geq N^0_{Rk,c}$	60	50	50	130	31,9	165	2	0,9	0,9	2,5	3,8	–	–	–	–	–	–	–	–	–	–	2,2-4,62	3,3-4,2	2,2-4,62	3,73-7,83
D12 - h_{nom} = 100 (US, S) - GVZ/CP	76	$\geq N^0_{Rk,c}$	81	50	50	150	42,7	165	2	0,8	0,8	3,4	5,1	76	$\geq N^0_{Rk,c}$	76	8,9	26,9	29,9	0,9	2,7	3,1	5,3	2,2-4,62	5,2-6,6	2,2-4,62	3,73-7,83
D14 - h_{nom} = 65 (US, S) - GVZ/CP	103	$\geq N^0_{Rk,c}$	50	60	60	120	46,5	269	2	0,8	1,1	2,8	4,2	–	–	–	–	–	–	–	–	–	–	3,08-6,46	2,5-3,2	3,08-6,46	6,14-12,89
D14 - h_{nom} = 85 (US, S) - GVZ/CP	103	$\geq N^0_{Rk,c}$	67	60	60	140	46,5	269	2	1,0	1,0	2,8	4,2	–	–	–	–	–	–	–	–	–	–	3,08-6,46	3,9-4,9	3,08-6,46	6,14-12,89
D14 - h_{nom} = 115 (US, S) - GVZ/CP	103	$\geq N^0_{Rk,c}$	93	60	60	180	61,7	269	2	0,8	1,1	5,4	8,1	103	$\geq N^0_{Rk,c}$	103	17,1	38,3	35,2	1,3	5,0	4,1	8,7	3,08-6,46	6,5-8,1	3,08-6,46	6,14-12,89
D8 - h_{nom} = 50 (SK, US TX, S TX) - GVZ/CP	35	6	40	35	35	100	13,1	51	1	0,5	1,3	1,4	2,0	–	–	–	–	–	–	–	–	–	–	0,99-2,12	1,2-1,5	0,99-2,12	1,17-2,62
D8 - h_{nom} = 65 (SK, US TX, S TX) - GVZ/CP	35	12	52	35	35	120	19,0	51	2	0,9	1,0	1,4	2,1	35	12	35	2,1	11,4	13,3	0,5	1,7	1,6	3,9	0,99-2,12	2,4-3,0	0,99-2,12	1,17-2,62
D10 - h_{nom} = 55 (SK, US TX, S TX) - GVZ/CP	55	9	43	40	40	100	29,4	95	1	0,7	0,7	3,2	4,9	–	–	–	–	–	–	–	–	–	–	1,21-2,96	1,8-2,3	1,21-2,96	2,34-4,92
D10 - h_{nom} = 65 (SK, US TX, S TX) - GVZ/CP	55	12	51	40	40	120	29,4	95	2	0,7	0,7	3,2	4,9	–	–	–	–	–	–	–	–	–	–	1,21-2,96	2,4-3,0	1,21-2,96	2,34-4,92
D10 - h_{nom} = 85 (SK, US TX, S TX) - GVZ/CP	55	$\geq N^0_{Rk,c}$	68	40	40	140	34,9	95	2	0,8	0,8	3,2	4,9	55	$\geq N^0_{Rk,c}$	55	6,0	22,3	20,4	0,8	2,8	2,7	7,1	1,21-2,96	4,0-5,0	1,21-2,96	2,34-4,92
D12 - h_{nom} = 60 (SK, US TX, S TX) - GVZ/CP	76	$\geq N^0_{Rk,c}$	47	50	50	110	31,9	165	2	0,7	1,3	2,5	3,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–
D12 - h_{nom} = 75 (SK, US TX, S TX) - GVZ/CP	76	$\geq N^0_{Rk,c}$	60	50	50	130	31,9	165	2	0,9	0,9	2,5	3,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–
D12 - h_{nom} = 100 (SK, US TX, S TX) - GVZ/CP	76	$\geq N^0_{Rk,c}$	81	50	50	150	42,7	165	2	0,8	0,8	3,4	5,1	76	$\geq N^0_{Rk,c}$	76	8,9	26,9	29,9	0,9	2,7	3,1	5,3	–	–	–	–
D14 - h_{nom} = 65 (SK, US TX, S TX) - GVZ/CP	103	$\geq N^0_{Rk,c}$	50	60	60	120	46,5	269	2	0,8	1,1	2,8	4,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
D14 - h_{nom} = 85 (SK, US TX, S TX) - GVZ/CP	103	$\geq N^0_{Rk,c}$	67	60	60	140	46,5	269	2	1,0	1,0	2,8	4,2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
D14 - h_{nom} = 115 (SK, US TX, S TX) - GVZ/CP	103	$\geq N^0_{Rk,c}$	93	60	60	180	61,7	269	2	0,8	1,1	5,4	8,1	103	$\geq N^0_{Rk,c}$	103	17,1	38,3	35,2	1,3	5,0	4,1	8,7	–	–	–	–

Performance parameter according to ETA-20/0321

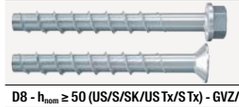
$\psi_{c,ex}$=1,12-1,58; γ_{inst}=1,0; $k_{cr,N,ex}$=7,7; $k_{ucr,N,ex}$=11; $c_{cr,N,ex}$=1,5 x h_{ef}; $k_{cr,N,ov}$=8,9; $k_{ucr,N,ov}$=12,7; $c_{cr,N,ov}$=1,5 x $h_{ef,ov}$; $h_{ef,ov}$=40-(L-$h_{nom,ex}$-2 R_i); $c_{cr,sp,ov}$=3 x $h_{ef,ov}$; $c_{min,ov}$=10+c_{nom}; α_{fi1}=0,8; $h_{min,ov}$=$h_{nom,ov}$+c_{nom}; α_{fi2}=1
Resistance to fire: Class A1



	Existing Concrete						Concrete Overlay					
	$h_{ef,ex}$ [mm]	$N_{Rk,s,ex}$ [kN]	$N_{Rk,p,ex}$ [kN]	$c_{min,ex}$ [mm]	$s_{min,ex}$ [mm]	$h_{min,ex}$ [mm]	$N_{Rk,s,ov}$ [kN]	A_h [mm²]	t_h [mm]	$s_{min,ov}$ [mm]	f_{yk} [N/mm²]	A_s [mm²]
D8 - h_{nom} = 50 (US,US TX) - GVZ	40	35	6	35	35	100	35	205	8,4	40	800	43,0
D8 - h_{nom} = 65 (US,US TX) - GVZ	52	35	12	35	35	120	35	205	8,4	40	800	43,0
D10 - h_{nom} = 55 (US,US TX) - GVZ	43	55	9	40	40	100	55	255	9,9	40	750	69,4
D10 - h_{nom} = 65 (US, US TX) - GVZ	51	55	12	40	40	120	55	255	9,9	40	750	69,4
D10 - h_{nom} = 85 (US, US TX) - GVZ	68	55	$\geq N^0_{Rk,c,ex}$	40	40	140	55	255	9,9	40	750	69,4
D12 - h_{nom} = 60 (US, US TX) - GVZ	47	76	$\geq N^0_{Rk,c,ex}$	50	50	110	76	308	10,3	45	750	100,3
D12 - h_{nom} = 75 (US, US TX) - GVZ	60	76	$\geq N^0_{Rk,c,ex}$	50	50	130	76	308	10,3	45	750	100,3
D12 - h_{nom} = 100 (US, US TX) - GVZ	81	76	$\geq N^0_{Rk,c,ex}$	50	50	150	76	308	10,3	45	750	100,3
D14 - h_{nom} = 65 (US,US TX) - GVZ	50	103	$\geq N^0_{Rk,c,ex}$	60	60	120	103	472	11,5	55	750	138,9
D14 - h_{nom} = 85 (US, US TX) - GVZ	67	103	$\geq N^0_{Rk,c,ex}$	60	60	140	103	472	11,5	55	750	138,9
D14 - h_{nom} = 115 (US, US TX) - GVZ	93	103	$\geq N^0_{Rk,c,ex}$	60	60	180	103	472	11,5	55	750	138,9

Performance parameter according to ETA-20/0134

$V_{Rk,s,fi}$=$N_{Rk,s,fi}$; $c_{min,fi}$=xy; $s_{min,fi}$=xy
Durability: (gvz) dry internal conditions
Resistance to fire: Class A1



	Characteristic resistance																						Displacements				Resistance to fire		
	$N_{Rk,s}$ [kN]	$V_{Rk,s}$ [kN]	$M^0_{Rk,s}$ [Nm]	$N_{Rk,p}$ [kN]	$N_{Rk,b}$ [kN]	$N_{Rk,p,c}$ [kN]	$N_{Rk,b,c}$ [kN]	$N_{Rk}{}^g$ [kN]	$\alpha_{g,N}$ [-]	$V_{Rk,b}$ [kN]	$V_{Rk,cII}$ [kN]	$V_{Rk,c,\perp}$ [kN]	$V^0_{Rk,b}$ [kN]	$V^0_{Rk,cII}$ [kN]	$V^0_{Rk,c,\perp}$ [kN]	$\alpha_{g,V}$ [-]	c_{cr} [mm]	c_{min} [mm]	s_{cr} [mm]	$s_{min,II}$ [mm]	$s_{min,\perp}$ [mm]	h_{min} [mm]	X [-]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]	$N_{Rk,s,fi}$ [kN]	$N_{Rk,p,fi}$ [kN]	$M^0_{Rk,s,fi}$ [Nm]
D8 - h_{nom} ≥ 50 (US/S/SK/US Tx/S Tx) - GVZ/CP	35	13,1	51	0,8-2,5	0,8-2,5	0,8-2,5	0,8-2,5	$\alpha_{g,N}$ x N_{Rk}	2	1,4-5,8	2,3-5,8	1,4-2,4	$\alpha_{g,V}$ x V_{Rk}	$\alpha_{g,V}$ x V_{RkII}	$\alpha_{g,V}$ x $V_{Rk,\perp}$	1,75	1,5xh_{nom}	60	3xh_{nom}	80	80	108-175	1,3	0,15-0,2	0,3-0,4	0,75-4,5	1,13-6,75	0,5-1,1	1-1,3	0,8-1,5
D10 - h_{nom} ≥ 55 (US/S/SK/US Tx/S Tx) - GVZ/CP	55	29,4	95	0,8-2,6	0,8-2,6	0,8-2,6	0,8-2,6	$\alpha_{g,N}$ x N_{Rk}	2	1,3-6,2	2,7-6,2	1,3-3,0	$\alpha_{g,V}$ x V_{Rk}	$\alpha_{g,V}$ x V_{RkII}	$\alpha_{g,V}$ x $V_{Rk,\perp}$	1,75	1,5xh_{nom}	70	3xh_{nom}	80	80	108-175	1,3	0,15-0,3	0,3-0,6	0,5-1,25	0,75-1,88	1,0-1,8	1,13	1,7-3,1