

AB1



HEAVY DUTY EXPANSION ANCHOR CE1 SEISMIC CATEGORY C2 (M10-M16)

- CE option 1 for cracked and uncracked concrete
- Seismic performance category C2 (M10-M12-M16)
- Electrogalvanized carbon steel
- Fire resistance R120
- Complete with nut and washer
- Suitable for dense materials
- Through fastening
- Torque-controlled expansion
- A filler (FILL or FILL-E) can be used to eliminate annular space and improve seismic performance



SERVICE CLASS	SC1 SC2	MATERIAL	bright zinc-plated carbon steel with zinc-nickel coating
ATMOSPHERIC CORROSIVITY	C1 C2		

CODES AND DIMENSIONS

CODE	d = d ₀ [mm]	L _t [mm]	t _{fix} t _{fix,red} [mm]	h ₁ h _{1,red} [mm]	h _{nom} h _{nom,red} [mm]	h _{ef} h _{ef,red} [mm]	d _f [mm]	SW [mm]	T _{inst} [Nm]	pcs
AB1890	M8	90	20	65	55	45	9	13	20	100
AB18110	M8	110	40	65	55	45	9	13	20	50
AB110105	M10	105	20	85	70	55	12	17	45	25
AB110145	M10	145	60	85	70	55	12	17	45	25
AB112115	M12	115	10	105	85	70	14	19	60	25
AB112125	M12	125	20	105	85	70	14	19	60	25
AB112145	M12	145	40	105	85	70	14	19	60	15
AB112165	M12	165	60	105	85	70	14	19	60	15
AB116145	M16	145	25 45	110 90	97 77	85 65	18	24	90	10

ADDITIONAL PRODUCTS - ACCESSORIES

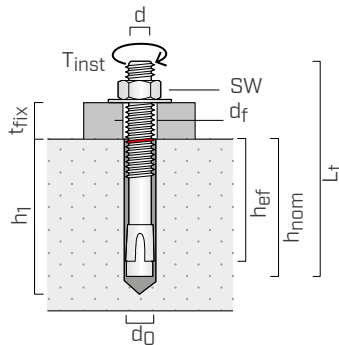
CODE	description	format	pcs
FILL	filling washer	M8-M24	-
FILL-E	filling cylinder	M10-M12	-
STINGRED	nozzle tip reducer	-	1
BRUH	steel pipe cleaner	M8-M30	-
BRUHAND	grip and extension for pipe cleaner	-	1
PONY	blow pump	-	1

GEOMETRY

LOADS UNDER STATIC CONDITIONS

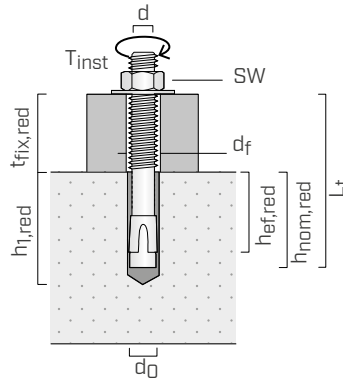
AB1 M8-M16

Standard installation



AB1 M16

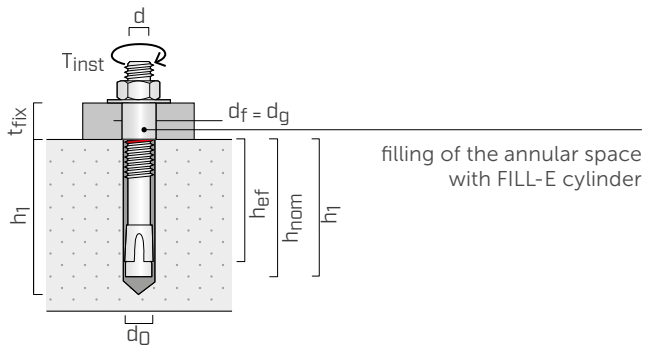
Standard or reduced installation.



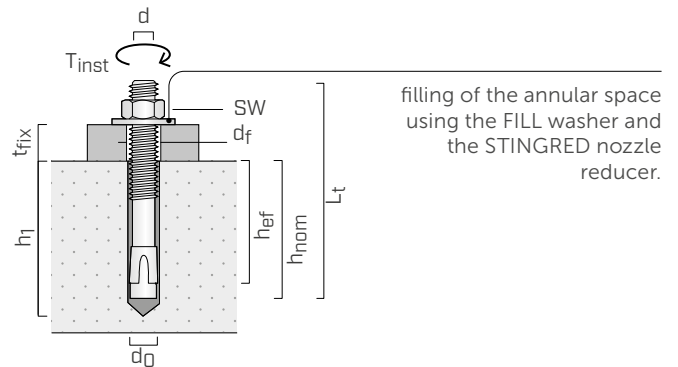
d	anchor diameter
d₀	hole diameter in the concrete support
L_t	anchor length
t_{fix}	maximum fastening thickness
h₁	minimum hole depth
h_{nom}	nominal anchoring depth
h_{ef}	effective anchoring depth
d_f	maximum hole diameter in the element to be fastened
SW	wrench size
T_{inst}	tightening torque

LOADS UNDER SEISMIC CONDITIONS - C1 and C2 seismic performance category

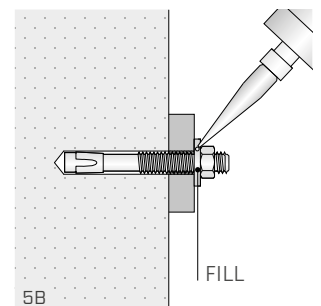
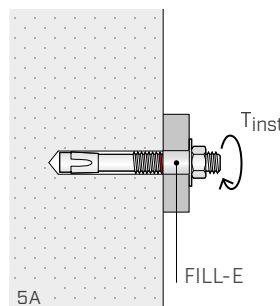
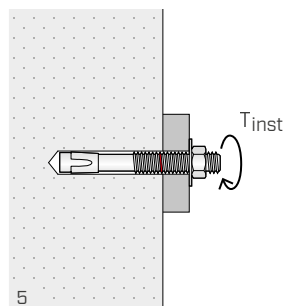
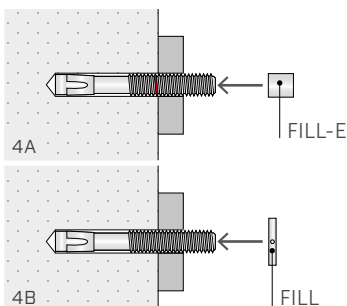
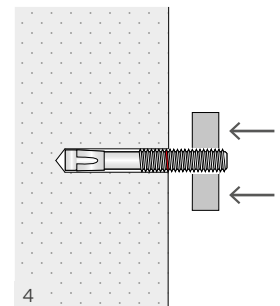
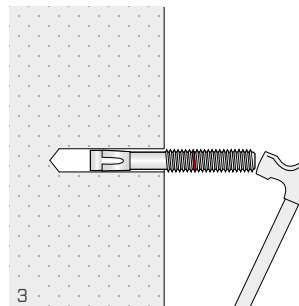
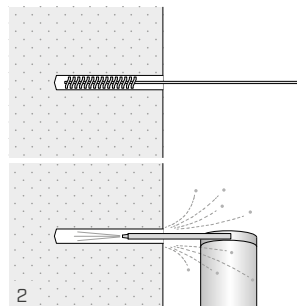
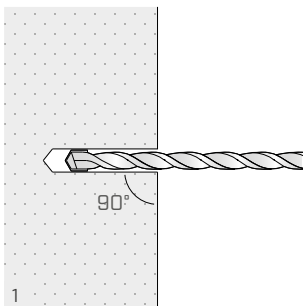
AB1 M10-M12



AB1 M16

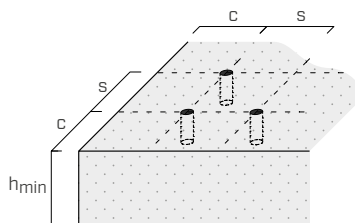


ASSEMBLY



Cases A and B, described in sections 4 and 5, shall be applied to loads under seismic conditions (performance categories C1 and C2). In particular, "A" refers to the steps relating to AB1 with M10-M12 diameters, while "B" refers to the steps relating to AB1 with M16 diameter.

■ INSTALLATION



Spacing and minimum distances		M8	M10	M12	M16 ⁽¹⁾	
Minimum thickness of concrete support	h_{min} [mm]	100	110	140	140	170
Minimum spacing	s_{min} [mm]	80	65	75	80	65
	for $c \geq$ [mm]	80	65	75	180	120
Minimum edge distance	c_{min} [mm]	80	80	90	90	80
	for $s \geq$ [mm]	80	80	90	200	150

Spacing and critical distances		M8	M10	M12	M16 ⁽¹⁾	
Critical spacing	$s_{cr,N}^{(1)}$ [mm]	135	165	210	255	255
	$s_{cr,sp}^{(2)}$ [mm]	200	280	300	425	340
Critical edge distance	$c_{cr,N}^{(1)}$ [mm]	67,5	82,5	105	127,5	127,5
	$c_{cr,sp}^{(2)}$ [mm]	100	140	150	213	170

For spacing and distances smaller than the critical ones, strength values have to be reduced depending on the installation parameters.

■ STRUCTURAL VALUES

Valid for a single anchor in thickened C20/25 grade concrete with a thin reinforcing layer when spacing and edge-distance are not limiting parameters.

CHARACTERISTIC VALUES

rod	UNCRAKED CONCRETE				CRACKED CONCRETE			
	tension ⁽²⁾		shear ⁽³⁾		tension ⁽²⁾		shear	
	$N_{Rk,p}$ [kN]	γ_{Mp}	$V_{Rk,s}$ [kN]	γ_{Ms}	$N_{Rk,p}$ [kN]	γ_{Mp}	V_{Rk} [kN]	γ_M
M8	7,5	1,8	12	1,5	6	1,8	10,39 ⁽⁴⁾	1,5
M10	16		20		9		14,05 ⁽⁴⁾	
M12	20		35		16		35,00 ⁽⁴⁾	
M16 ⁽¹⁾	35	1,5	55	1,25	25	1,5	64,77 ⁽⁴⁾	

incremental factor for $N_{Rk,p}^{(2)} = \psi_c \times N_{Rk,p,C20/25}$			
ψ_c	M8-M12	C30/37	1,22
		C40/50	1,41
		C50/60	1,55
	M16	C30/37	$(f_{ck}/20)^{0,5}$
		C40/50	
		C50/60	

NOTES

- ⁽¹⁾ Values refer to installation of the M16 anchor in cracked and non-cracked concrete with insertion depth $h_{nom}=97$ mm.
- ⁽²⁾ Pull-out failure mode.
- ⁽³⁾ Steel failure mode.
- ⁽⁴⁾ Pry-out failure mode.
- ⁽⁵⁾ Breakage characteristics for formation of concrete cone for tensile loads.
- ⁽⁶⁾ Splitting failure mode for tensile loads.

GENERAL PRINCIPLES

- The characteristic values for M8, M10 and M12 diameters are calculated according to ETA-25/0860; characteristic values for the M16 diameter are calculated according to ETA-99/0010.
- The design values are obtained from the characteristic values as follows: $R_d = R_k / \gamma_M$. Coefficients γ_M are listed in the table in accordance with the failure characteristics and product certificates.
- Filling of the gap between the anchor and the hole diameter in the plate under seismic conditions:
 - for M10–M12 diameters, use the FILL-E filler.
 - for M16 diameter, use the FILL washer in combination with the STINGRED nozzle reducer.
- For the design of anchors with reduced spacing, close edge distances, or for fastening to higher-strength concrete, reduced-thickness concrete, or thick reinforced concrete, please refer to the ETA.
- For the calculation of anchors subjected to fire refer to the ETA and the Technical Report 020.