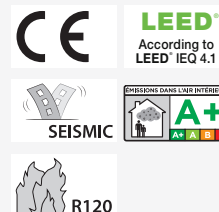


EPOPLUS

High-performance epoxy chemical anchor

CE Option 1 - C2 Seismic performance category



- CE option 1
- Certified use for cracked and uncracked concrete
- C2 Seismic performance category (M12-M16)
- C1 Seismic performance category (M12-M30)
- Fire resistance R120
- Comply with LEED®, IEQ Credit 4.1
- A+ Class: emission of volatile organic compounds (VOC) in lived environments
- Dry, wet and soaked concrete hole
- Anchoring in cored holes
- Certified for use in contact with potable water
- Dielectric fastening



EPOPLUS



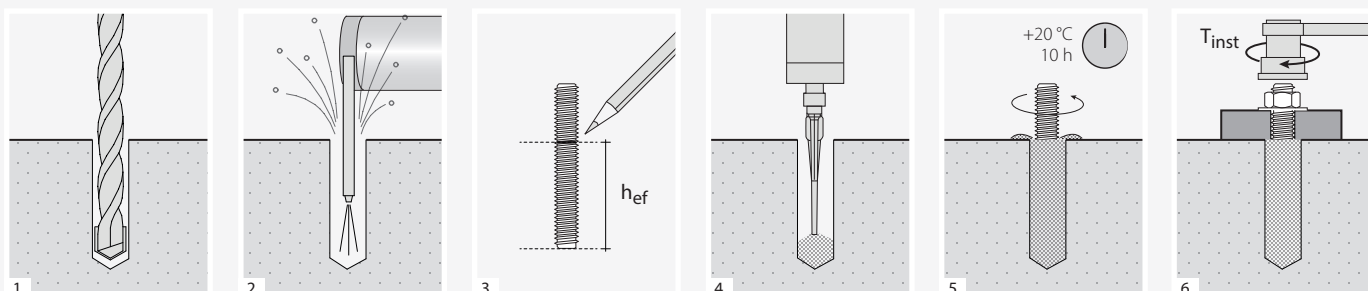
code	format [ml]	pcs/box
FE400070	385	1

Expiry from date of manufacturing: 24 months

ADDITIONAL PRODUCTS-ACCESSORIES

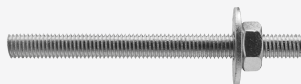
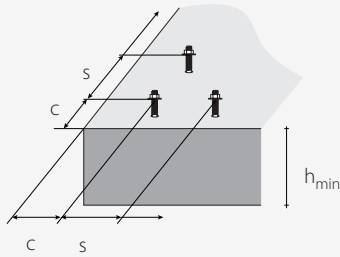
code	description	format [ml]	pcs/box
MAMDB	gun for double cartridge	385	1
STING	nozzle	-	12
PONY	blowing pump	-	1

ASSEMBLY



INSTALLATION

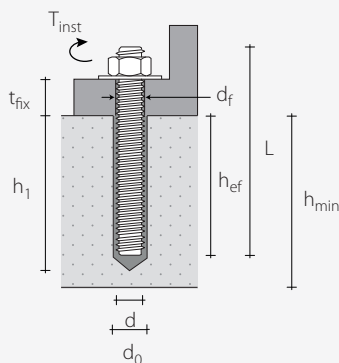
INSTALLATION GEOMETRY – THREADED RODS (TYPE INA O MGS)



d	[mm]	M8	M10	M12	M16	M20	M24	M27
d_0	[mm]	10	12	14	18	24	28	32
$h_{ef,min}$	[mm]	64	80	96	128	160	192	216
$h_{ef,max}$	[mm]	96	120	144	192	240	288	324
d_f	[mm]	9	12	14	18	22	26	30
T_{inst}	[Nm]	10	20	40	80	120	160	180

			M8	M10	M12	M16	M20	M24	M27
Minimum spacing	s_{min}	[mm]	40	50	60	80	100	120	135
Minimum edge distance	c_{min}	[mm]	40	50	60	80	100	120	135
Minimum thickness of concrete support	h_{min}	[mm]	$h_{ef} + 30 \geq 100 \text{ mm}$			$h_{ef} + 2 d_0$			

For spacing and distance smaller than the critical ones, strength values have to be reduced according to the installation parameters.



d = anchor diameter
 d_0 = hole diameter in the concrete support
 h_{ef} = effective anchor depth
 d_f = maximum hole diameter in the element to be fastened

T_{inst} = tightening torque
 L = anchor length
 t_{fix} = maximum fixing thickness
 h_1 = minimum hole depth

INSTALLATION TIME AND TEMPERATURE

support temperature	workability time	curing time before loading	
		dry support	wet support
5 ÷ 9 °C	120 min	50 h	4 h
10 ÷ 19 °C	90 min	30 h	160 min
20 ÷ 29 °C	30 min	10 h	90 min
35 ÷ 39 °C	20 min	6 h	40 min
40 °C	12 min	4 h	30 min

Cartridge storage temperature + 5 ÷ + 25 °C

STATIC CHARACTERISTIC VALUES

Valid for a single threaded rod (type INA o MGS) in C20/25 grade concrete when spacing and edge-distance are not limiting parameters.

UNCRACKED CONCRETE ⁽¹⁾

TENSION

bar	$h_{ef,min}$ [mm]	$N_{Rk,p}^{(2)}$ [kN]				$h_{ef,max}$ [mm]	$N_{Rk,s} / R_{k,p}^{(3)}$ [kN]			
		steel 5.8	γ_{Mp}	steel 8.8	γ_{Mp}		steel 5.8	γ_M	steel 8.8	γ_{Mp}
M8	64	20,9	1,8	20,9	1,8	96	18,0	$\gamma_{Ms} = 1,5$	31,4	1,8
M10	80	32,7		32,7		120	29,0		49,0	
M12	96	43,4		43,4		144	42,0		65,1	
M16	128	73,1		73,1		192	78,0		115,8	
M20	160	102,2	2,1	102,2	2,1	240	165,9	$\gamma_{Mp} = 2,1$	165,9	2,1
M24	192	134,4		134,4		288	217,1		217,1	
M27	216	160,3		160,3		324	274,8		274,8	

SHEAR

bar	h_{ef} [mm]	$V_{Rk,s}^{(4)}$ [kN]			
		steel 5.8	γ_{Ms}	steel 8.8	γ_{Ms}
M8	≥ 64	9,0	1,25	15,0	1,25
M10	≥ 80	15,0		23,0	
M12	≥ 96	21,0		34,0	
M16	≥ 128	39,0		63,0	
M20	≥ 160	61,0		98,0	
M24	≥ 192	88,0		141,0	
M27	≥ 216	115,0		184,0	

increment factor for $N_{Rk,p}^{(5)}$		
ψ_c	C25/30	1,02
	C30/37	1,04
	C40/50	1,08
	C50/60	1,10

CRACKED CONCRETE ⁽¹⁾

TENSION

bar	$h_{ef,min}$ [mm]	$N_{Rk,p}^{(2)}$ [kN]				$h_{ef,max}$ [mm]	$N_{Rk,p}^{(2)}$ [kN]			
		steel 5.8	γ_{Mp}	steel 8.8	γ_{Mp}		steel 5.8	γ_{Mp}	steel 8.8	γ_{Mp}
M12	96	23,5	1,8	23,5	1,8	144	35,3	1,8	35,3	1,8
M16	128	35,4		35,4		192	53,1		53,1	
M20	160	50,3	2,1	50,3	2,1	240	75,4	2,1	75,4	2,1
M24	192	65,1		65,1		288	97,7		97,7	
M27	216	82,4		82,4		324	123,7		123,7	

SHEAR

bar	$h_{ef,min}$ [mm]	$V_{Rk} [kN]$				$h_{ef,max}$ [mm]	$V_{Rk,s}^{(4)} [kN]$			
		steel 5.8	γ_{Ms}	steel 8.8	γ_M		steel 5.8	γ_{Ms}	steel 8.8	γ_{Ms}
M12	96	21,0	1,25 ⁽⁴⁾	34,0	$\gamma_{Ms} = 1,25$ ⁽⁴⁾	144	21,0	1,25	34,0	1,25
M16	128	39,0		70,8	$\gamma_{Ms} = 1,5$ ⁽⁶⁾	192	39,0		63,0	
M20	160	61,0		100,5		240	61,0		98,0	
M24	192	88,0		130,3		288	88,0		141,0	
M27	216	115,0		164,9		324	115,0		184,0	

STATIC ADMISSIBLE VALUES

UNCRACKED CONCRETE

TENSION

bar	$h_{ef,min}$ [mm]	N_{rec} [kN]		$h_{ef,max}$ [mm]	N_{rec} [kN]	
		steel 5.8	steel 8.8		steel 5.8	steel 8.8
M8	64	8,3	8,3	96	8,6	12,4
M10	80	13,0	13,0	120	13,8	19,4
M12	96	17,2	17,2	144	20,0	25,9
M16	128	29,0	29,0	192	37,1	46,0
M20	160	34,8	34,8	240	56,4	56,4
M24	192	45,7	45,7	288	73,9	73,9
M27	216	54,5	54,5	324	93,5	93,5

SHEAR

bar	$h_{ef,min}$ [mm]	V_{rec} [kN]	
		steel 5.8	steel 8.8
M8	≥ 64	5,1	8,6
M10	≥ 80	8,6	13,1
M12	≥ 96	12,0	19,4
M16	≥ 128	22,3	36,0
M20	≥ 160	34,9	56,0
M24	≥ 192	50,3	80,6
M27	≥ 216	65,7	105,1

CRACKED CONCRETE

TENSION

bar	$h_{ef,min}$ [mm]	N_{rec} [kN]		$h_{ef,max}$ [mm]	N_{rec} [kN]	
		steel 5.8	steel 8.8		steel 5.8	steel 8.8
M12	96	9,3	9,3	144	14,0	14,0
M16	128	14,0	14,0	192	21,1	21,1
M20	160	17,1	17,1	240	25,6	25,6
M24	192	22,2	22,2	288	33,2	33,2
M27	216	28,0	28,0	324	42,1	42,1

SHEAR

bar	$h_{ef,min}$ [mm]	V_{rec} [kN]		$h_{ef,max}$ [mm]	V_{rec} [kN]	
		steel 5.8	steel 8.8		steel 5.8	steel 8.8
M12	96	12,0	19,4	144	12,0	19,4
M16	128	22,3	33,7	192	22,3	36,0
M20	160	34,9	47,9	240	34,9	56,0
M24	192	50,3	62,0	288	50,3	80,6
M27	216	65,7	78,5	324	65,7	105,1

GENERAL PRINCIPLES

- Characteristic values according to ETA and in accordance with the design method contained in TR029 o CEN/TS 1992-4:2009.
- Design values can be obtained from characteristic values as follows:

$$R_d = \frac{R_k}{\gamma_m}$$

- Coefficients γ_m are listed in the table in accordance with the product certificates.
- Admissible values (recommended) are evaluated from the characteristic values by applying the material safety factors γ_m according to ETA and a further partial factor for actions $\gamma_f = 1,4$.
- For the design of anchors subjected to seismic loading refer to ETA and to ETAG 001 (Annex E and TR045).
- For the calculation of anchors with reduced spacing, or too close to the edge, please refer to ETA. Similarly, in case of fastening on concrete-supports with a better-grade or limited thickness please see ETA.

NOTES

- (1) For the calculation of anchors in masonry or in case of high bond bars, please refer to ETA document.
- (2) Pull-out and concrete cone failure.
- (3) Steel failure for 5.8 grade rods while variable failure mode (steel failure / pull-out) for 8.8 grade rods.
- (4) Steel failure.
- (5) Increment factor for tensile strength (excluding steel failure) valid both for cracked and uncracked concrete.
- (6) Pry-out failure mode.

INA

5.8 steel-grade threaded-rod for chemical anchors

- Complete with nut (ISO4032) and washer (ISO7089)
- 5.8 grade galvanized steel

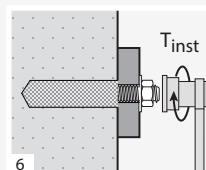
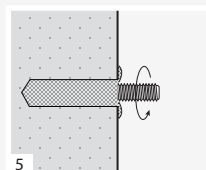
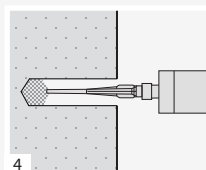
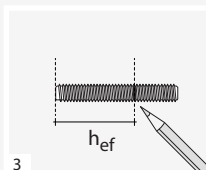
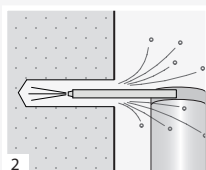
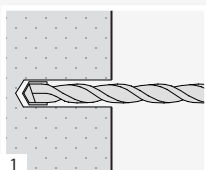
INA



code	d [mm]	L _t [mm]	d ₀ [mm]	d _f [mm]	pcs/box
FE210100	M8	110	10	≤ 9	10
FE210105	M10	110	12	≤ 12	10
FE210110		130	12	≤ 13	10
FE210115	M12	130	14	≤ 14	10
FE210119		180	14	≤ 15	10
FE210116	M16	160	18	≤ 18	10
FE210118		190	18	≤ 18	10
FE210121		230	18	≤ 18	10
FE210117	M20	240	24	≤ 22	10
FE210122	M24	270	28	≤ 26	10
FE210123	M27	400	32	≤ 30	10

d₀ = hole diameter in the support / d_f = hole diameter in the element to be fastened

ASSEMBLY



IHP - IHM

Mesh bush for hollow materials

IHP - PLASTIC MESH



code	d ₀ [mm]	L [mm]	bar [mm]	d ₀ [mm]	pcs/box
FE210120	16	85	M10 (M8)	16	10
FE210125	16	130	M10 (M8)	16	10
FE210130	20	85	M12 / M16	20	10

IHM - METALLIC MESH



code	d ₀ [mm]	L [mm]	bar [mm]	d ₀ [mm]	pcs/box
FE210230	12	1000	M8	12	10
FE210235	16	1000	M8 / M10	16	10
FE210240	22	1000	M12 / M16	22	5

ASSEMBLY

