

## Rebar anchoring system



ETA 07/0189  
EAD 330087-00-0601

### EPCON C8

- EPOXY resin
- Slow drying time
- Storage time: 3 years
- Usable in wet environments
- Performance in diamond drilling
- Good fire performance
- Odour-free
- Easy injection
- No shrinkage after hardening
- NF mark overhead position

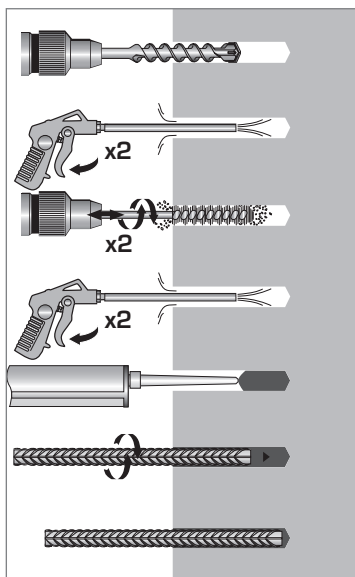


### FIRE BEHAVIOUR

- see pages 146 to 149



### INSTALLATION\*



#### \*Premium cleaning :

- 2 blowing with compressed air
- 2 brushing with brushed fitted on a drilling machine
- 2 blowing with compressed air

### Mechanical characteristics of rebars

Nominal steel rebar Ø		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32	Ø40
Sections (cm <sup>2</sup> )		0,503	0,785	1,13	1,54	2,01	3,14	4,91	8,04	12,57
Min. resistances to failure (kN)	Fe E400	21,13	32,97	47,46	64,68	84,42	131,88	206,22	337,68	527,94
	Fe E500	25,90	40,43	58,20	79,31	103,52	161,71	252,87	414,06	647,36
Ultimate limit load N <sub>Rd</sub> (kN)	Fe E500	21,85	34,15	49,17	66,93	87,42	136,59	213,43	349,56	546,36

The mechanical characteristics of the high adhesion rebars are defined in the NFA 35-016 and NFA 35-017 standards.

### Setting time

Temperature	Max. time for installation (min)	Waiting time for 45 % load (h)	Curing time (h)
40°C	5	3	6
30°C	8	5	8
20°C	14	6	12
10°C	20	12	23
5°C	26	15	26

### Chemical resistance of the SPIT EPCON C8 resin

Chemical substances	Concentration (%)	Resistance	Chemical substances	Concentration (%)	Resistance
Sulfuric acid	10	(o)	Toluene		(o)
Hydrochloric acid	10	(o)	Ethanol		(o)
Nitric acid	10	(o)	Methyl-ethyl-ketone (MEK)		(-)
Acetic acid	10	(o)	Methanol		(-)
Ammonium hydroxide	10	(o)	DeminerIALIZED water		(+)
Sodium Hypochlorite	5	(o)	Sea water	100	(+)
Sodium hydroxide	50	(o)	Engine Petrol	100	(+)
Acetone		(-)	Motor oil	100	(+)

**Resistant (+):** the samples in contact with the substances did not show any Screwible damage such as cracks, attacked surfaces, burst corners nor large swelling. **Sensitive (o):** use with care regarding exposure of the field of usage, precautions to be taken. The samples in contact with the substance slightly attacked the material.

### Sizing rules for steel reinforcement fixings for concrete according to eurocode 2 regulations and ETA 07/0189

The basic anchorage length  $L_{b,rqd}$  (mm) for the ultimate limit load for rebar  $F_{Rd}$  (N) is given by following equation:

$$L_{b,rqd} = \frac{F_{Rd}}{\Pi \cdot \varnothing \cdot \eta_1 \cdot \eta_2 \cdot f_{bd}}$$

The design anchorage length  $L_{bd}$  (mm) is determined as follow:

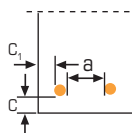
$$L_{bd} = L_{b,rqd} \cdot \alpha_2 \cdot \alpha_5$$

- $F_{Rd}$ : Design ultimate load (N)
- $f_{bd}$ : Design value of the bond strength in N/mm<sup>2</sup>
- $\varnothing$ : Rebar diameter (mm)
- $\eta_1$ : depends on bond conditions -  $\eta_1 = 1$  ("good bond" conditions). See § 8.4.2 (EN 1992-1-1)
- $\eta_2$ : depends on rebar diameter -  $\eta_2 = 1$  for  $\varnothing_{rebar} \leq 32$  mm

with  $\alpha_2$ : **Influence of concrete minimum cover**

$$\alpha_2 = 1 - 0,15 (C_d - \varnothing_{rebar}) / \varnothing_{rebar} \geq 0,7$$

$$C_d = \min \left( C ; C_1 ; \frac{a}{2} \right)$$



with  $\alpha_5$ : **Influence of the confinement by transverse pressure**

The factor  $\alpha_5$  take into account of the effect of the pressure transverse to the plane of splitting along the design length.

$$\alpha_5 = 1 - 0,04 \cdot p \geq 0,7$$

where p is the transverse pressure at the ultimate limit state along  $L_{bd}$  in MPa.

p (MPa)	$\alpha_5$
3	0,88
5	0,8
7	0,72

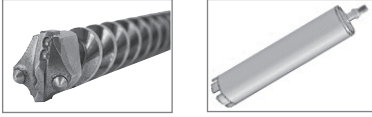
### Limit of this formula

The max. anchor depth will be limited to 1500 mm with pneumatic injection tool.



## Eurocode 2 table for straight rebar anchoring

### CONCRETE C25/30 - HAMMER DRILLING/DIAMOND CORING



Rebar $\varnothing$ (mm)	Drilling $\varnothing$ $d_0$ (mm)	Length of anchor $L_{bd}$ (mm)	Ultimate limit load (daN) without influence of center distance and/or edge <sup>(1)</sup>	Ultimate limit load (daN) with influence of center distance and/or edge <sup>(2)</sup>	Number of sealings per SPIT EPCON C8 cartridge <sup>(3)</sup>	
			$(\alpha_2 = 0,7)$	$(\alpha_2 = 1)$	450 ml	900 ml
8	10	100	969	679	132,6	265,3
		190	1842	1289	69,8	139,6
		225	2185	1530	58,8	117,7
		322	-	2185	41,2	82,4
10	12	121	1466	1026	89,7	179,4
		230	2787	1951	47,2	94,4
		282	3415	2391	38,5	77,0
		403	-	3415	27,0	53,9
12	15	145	2108	1476	40,7	81,3
		280	4072	2850	21,1	42,1
		338	4917	3442	17,4	34,9
		483	-	4917	12,2	24,4
14	18	169	2867	2007	22,1	44,1
		330	5598	3919	11,3	22,6
		395	6693	4685	9,5	18,9
		564	-	6693	6,6	13,2
16	20	193	3742	2619	17,2	34,4
		370	7174	5022	9,0	17,9
		451	8742	6119	7,4	14,7
		644	-	8742	5,1	10,3
20	25	242	5865	4105	8,8	17,5
		470	11391	7973	4,5	9,0
		564	13659	9561	3,8	7,5
		805	-	13659	2,6	5,3
25	32	302	9149	6404	4,0	7,9
		550	16662	11663	2,2	4,4
		704	21342	14939	1,7	3,4
		1006	-	21342	1,2	2,4
28	35	338	11468	8028	3,2	6,4
		600	20358	14250	1,8	3,6
		789	26770	18739	1,4	2,7
		1127	-	26770	1,0	1,9
32	40	386	14968	10477	2,1	4,3
		750	29082	20358	1,1	2,2
		901	34956	24469	0,9	1,8
		1288	-	34956	0,6	1,3
40	50	483	23411	16388	1,1	2,2
		800	38776	27143	0,7	1,3
		1127	54636	38245	0,5	0,9
		1500	-	50894	0,4	0,7

<sup>(1)</sup> Absence of edge distances greater than or equal to  $7 \cdot \varnothing$

<sup>(2)</sup> Presence of edge distances and/or centre distances less than  $7 \cdot \varnothing$

<sup>(3)</sup> The number of fixings per cartridge is calculated taking into account an increasing by 20% the real volume of sealing.

$$1,2 \times (d_0^2 - \varnothing_{\text{rebar}}^2) \times \Pi \times L_{bd}/4$$