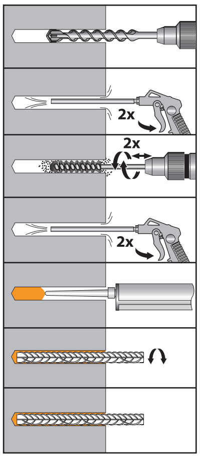
Epcon C8
Starter Bar Fastenings

Applications

- Starter bar fastenings in non-reinforced concrete

Installation

Premium cleaning*



***Premium cleaning:**

- Blow with compressed air X2
- Clean with a brush attached to a drilling machine X2
- Blow with compressed air X2

Epoxy resin
Starter bar fastenings

Technical data

SPIT EPCON C8 RESIN	Max. anchor depth (mm)	Min thick of base material (mm)	Drilling depth (mm)	Ø Drill bit (mm)
	h_{ef}	h_{min}	h_o	d_o
EPCON C8 Ø8	80	100	80	10
EPCON C8 Ø10	90	120	90	12
EPCON C8 Ø12	110	140	110	15
EPCON C8 Ø14	125	170	125	18
EPCON C8 Ø16	125	170	125	18
EPCON C8 Ø20	170	220	170	25
EPCON C8 Ø25	210	270	210	30
EPCON C8 Ø30	300	380	300	40
EPCON C8 Epoxy resin, dual component cartridge		- vol. 450 ml		

Mechanical Characteristics of rebar

Nominal steel bar Ø		8	10	12	14	16	20	25	32	40
Sections (cm²)		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_{Rd} (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

Ambient temperature (°C)	**SPIT EPCON C8 resin**		
	Max. time for installation (min.)	**Waiting time 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

The loads specified on this page are derived from internal test results. For results derived from CC Methodology, please see overleaf. The data given in the pages “CC - Method” have to be applied.

Number of fixings per cartridge

Anchor size	8	10	12	14	16	20	25	32
Drilling Ø (mm)	10	12	15	18	20	25	30	40
Drilling depth (mm)	80	90	110	125	125	170	210	300
Number of fixings for one cartridge								
EPCON C8 450 ml	166	121	54	30	27	12	8	3

Ultimate ($N_{Ru,m}$, $V_{Ru,m}$) / characteristic loads (N_{Rk}, V_{Rk}) in kN

Mean Ultimate loads are derived from test results in admissible service conditions, and characteristic loads are statistically determined.

TENSILE

Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
h_{ef}	80	90	110	125	125	170	210	300
$N_{Ru,m}$	33.4	46.9	68.8	91.3	104.3	177.3	273.8	407.2
N_{Rk}	25.1	35.3	51.8	68.7	78.5	133.5	206.2	304.6

SHEAR

Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
$V_{Ru,m}$	18.4	28.8	41.4	56.5	73.7	115.1	180.0	294.8
V_{Rk}	16.6	25.9	37.3	50.8	66.3	103.6	162.0	265.3

Design Loads (N_{Rd}, V_{Rd}) for one anchor without edge or spacing influence in kN

$$N_{Rd} = \frac{N_{Rk}\,^{*}}{\gamma_{Mc}}$$

$$V_{Rd} = \frac{V_{Rk}\,^{*}}{\gamma_{Ms}}$$

*Derived from test results

TENSILE

Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
h_{ef}	80	90	110	125	125	170	210	300
N_{Rd}	14.0	19.6	28.8	38.2	43.6	74.2	114.5	169.2

$\gamma_{Mc} = 1.8$

SHEAR

Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
V_{Rd}	11.1	17.3	24.9	33.9	44.2	69.1	108.0	176.9

$\gamma_{Ms} = 1.5$

Recommended loads (N_{rec}, V_{rec}) for one anchor without edge or spacing influence in kN

$$N_{Rec} = \frac{N_{Rk}\,^{*}}{\gamma_{M}\gamma_{F}}$$

$$V_{Rec} = \frac{V_{Rk}\,^{*}}{\gamma_{M}.\gamma_{F}}$$

*Derived from test results

TENSILE

Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
h_{ef}	80	90	110	125	125	170	210	300
N_{Rec}		14.0	20.6	27.3	31.2	53.0	81.8	120.9

$\gamma_{F} = 1.4$

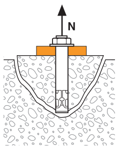
SHEAR

Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
V_{Rec}	7.9	12.3	17.8	24.2	31.6	49.3	77.2	126.3

$\gamma_{F} = 1.4$

SPIT CC - Method

TENSILE in kN

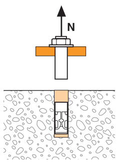


Concrete cone resistance for dry concrete

$$N_{Rd,p} = N^{O}_{Rd,p} . f_b$$

$N^0_{Rd,c}$ Rebar Ø	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
					Design cone resistance			
h_{ef}	80	90	110	125	125	170	210	330
$N_{Rd,c}$	14.0	19.6	28.8	38.2	43.6	74.2	114.5	169.2

γ_{Mc} = 1.8

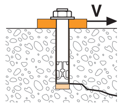


Steel resistance Rebar Fe E500

$N_{Rd,s}$ Rebar Ø	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
					Design steel tensile resistance			
$N_{Rd,s}$	21.0	32.7	47.1	64.2	83.8	130.8	204.6	335.0

γ_{Ms} Fe E500 = 1.32

SHEAR in kN

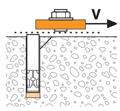


Concrete edge resistance

$$V_{Rd,c} = V^{O}_{Rd,c} . f_b . f_{\beta,V} . \Psi_{S-C,V}$$

$V^0_{Rd,c}$ Rebar Ø	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
					Design concrete edge resistance at minimum edge distance (C_{min})			
h_{ef}	80	90	110	125	125	170	210	300
C_{min}	40	45	55	65	65	85	105	150
S_{min}	40	45	55	65	65	85	105	150
$V_{Rd,c}$	2.4	3.1	4.6	6.4	6.6	11.3	17.3	34.1

γ_{Mc} = 1.5



Steel resistance

$V^0_{Rd,cp}$ Rebar Ø	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
					Design steel shear resistance			
$V_{Rd,s}$	11.1	17.3	24.9	33.9	44.2	69.1	108.0	176.9

$\gamma_{Ms\ Fe\ E500}$ = 1.5

$$N_{Rd} = \min(N_{Rd,c}\ ;\ N_{Rd,s})$$
$$\beta_N = N_{Sd} / N_{Rd} \leq 1$$

$$V_{Rd} = \min(V_{Rd,c}\ ;\ V_{Rd,s})$$
$$\beta_V = V_{Sd} / V_{Rd} \leq 1$$

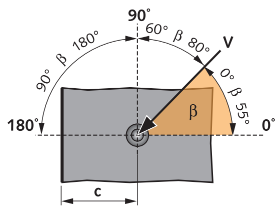
$$\beta_N + \beta_V \leq 1.2$$

f_B Influence of Concrete

Concrete class	f_B
C20/25	1.00
C30/40	1.14
C40/60	1.26
C50/60	1.34

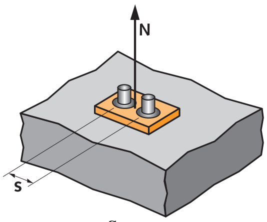
$f_{\beta,V}$ Influence of Shear Loading Direction

Angle β [°]	$f_{\beta,V}$
0 to 55	1
60	1.1
70	1.2
80	1.5
90 to 180	2



SPIT CC - Method

Ψ_s Influence of spacing for concrete cone resistance in tensile load



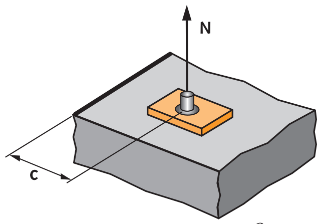
$$\Psi_S = 0{,}5 + \frac{s}{4.h_{ef}}$$

$S_{min} < S < S_{cr,N}$
$S_{cr,N} = 2.h_{ef}$
Ψ_s must be used for each spacing influenced the anchors group.

SPACING S	Reduction factor Ψ_s Non-cracked concrete Ø8	Ø10	Ø12	Ø14
40	0.63			
45	0.64	0.63		
55	0.67	0.65	0.63	0.61
65	0.70	0.68	0.65	0.63
85	0.77	0.74	0.69	0.67
105	0.83	0.79	0.74	0.71
140	0.94	0.89	0.82	0.78
160	1.00	0.94	0.86	0.82
180		1.00	0.91	0.86
220			1.00	0.94
250				1.00

SPACING S	Reduction factor Ψ_s Non-cracked concrete Ø16	Ø20	Ø25	Ø32
65	0.63			
85	0.67	0.63		
105	0.71	0.65	0.63	
120	0.74	0.68	0.64	
150	0.80	0.72	0.68	0.63
200	0.90	0.79	0.74	0.67
250	1.00	0.87	0.80	0.71
320		0.97	0.88	0.77
340		1.00	0.90	0.78
420			1.00	0.85
500				0.92
600				1.00

$\Psi_{c,N}$ Influence of edge for concrete cone resistance in tensile load



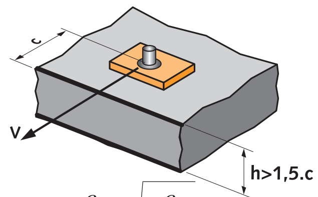
$$\Psi_{c,N} = 0{,}27 + 0{,}725 . \frac{c}{h_{ef}}$$

$C_{min} < C < C_{cr,N}$
$C_{cr,N} = h_{ef}$
$\Psi_{c,N}$ must be used for each distance influenced the anchors group.

EDGE C	Reduction factor $\Psi_{c,N}$ Non-cracked concrete Ø8	Ø10	Ø12	Ø14
40	0.63			
45	0.68	0.63		
55	0.77	0.71	0.63	
65	0.86	0.79	0.70	0.65
80	1.00	0.91	0.80	0.73
90		1.00	0.86	0.79
110			1.00	0.91
125				1.00

EDGE C	Reduction factor $\Psi_{c,N}$ Non-cracked concrete Ø16	Ø20	Ø25	Ø32
65	0.65			
85	0.76	0.63		
105	0.88	0.72	0.63	
125	1.00	0.80	0.70	
150		0.91	0.79	0.63
170		1.00	0.86	0.68
210			1.00	0.78
300				1.00

$\Psi_{s-c,V}$ Influence of spacing and edge distance for concrete edge resistance in shear load

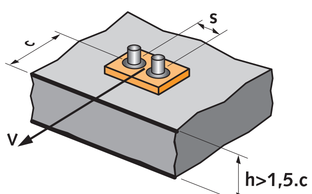


$$\Psi_{s-c,V} = \frac{c}{c_{min}} . \sqrt{\frac{c}{c_{min}}}$$

For single anchor fastening

Factor $\Psi_{s-c,V}$
Non-cracked concrete

$\frac{C}{C_{min}}$	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2
$\Psi_{s-c,V}$	1,00	1,31	1,66	2,02	2,41	2,83	3,26	3,72	4,19	4,69	5,20	5,72

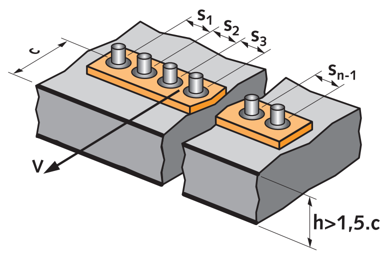


$$\Psi_{s-c,V} = \frac{3.c + s}{6.c_{min}} . \sqrt{\frac{c}{c_{min}}}$$

For 2 anchors

Factor $\Psi_{s-c,V}$
Non-cracked concrete

$\frac{S}{C_{min}}$ \ $\frac{C}{C_{min}}$	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,4	2,6	2,8	3,0	3,2
1,0	0,67	0,84	1,03	1,22	1,43	1,65	1,88	2,12	2,36	2,62	2,89	3,16
1,5	0,75	0,93	1,12	1,33	1,54	1,77	2,00	2,25	2,50	2,76	3,03	3,31
2,0	0,83	1,02	1,22	1,43	1,65	1,89	2,12	2,38	2,63	2,90	3,18	3,46
2,5	0,92	1,11	1,32	1,54	1,77	2,00	2,25	2,50	2,77	3,04	3,32	3,61
3,0	1,00	1,20	1,42	1,64	1,88	2,12	2,37	2,63	2,90	3,18	3,46	3,76
3,5		1,30	1,52	1,75	1,99	2,24	2,50	2,76	3,04	3,32	3,61	3,91
4,0			1,62	1,86	2,10	2,36	2,62	2,89	3,17	3,46	3,75	4,05
4,5				1,96	2,21	2,47	2,74	3,02	3,31	3,60	3,90	4,20
5,0					2,33	2,59	2,87	3,15	3,44	3,74	4,04	4,35
5,5						2,71	2,99	3,28	3,71	4,02	4,33	4,65
6,0						2,83	3,11	3,41	3,71	4,02	4,33	4,65



For 3 anchors or more

$$\Psi_{s-c,V} = \frac{3.c + s_1 + s_2 + s_3 + \ldots + s_{n-1}}{3\,n\,c} . \sqrt{\frac{c}{c}}$$