

# SPIT GRIP & GRIP L

Zinc coated steel

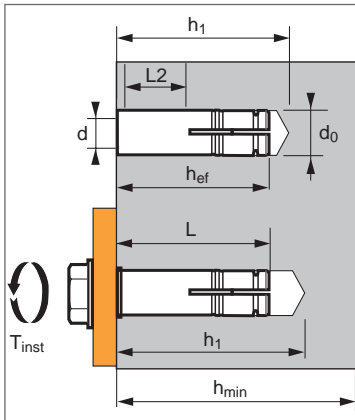


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ETA Option 7  
n° 05/0053

## Deformation-controlled expansion female anchor



### Technical data

SPIT GRIP & GRIP L	Anchor depth (mm)	Ø thread (mm)	Thread length (mm)	Drilling depth (mm)	Ø thread (mm)	Min thick of base material (mm)	Total anchor length (mm)	Maximum tighten torque (Nm)	Code Grip	Code Grip L	Image	
	hef	d	L2	h1	d0	hmin	L	Tinst				
M6x25	25	6	10	28	8	100	25	5	050788	-	ST-M M6x25	050921
M6x30	30	6	13	32	8	100	30	5	062040	050789	ST-M M6x30	050922
M7x30	30	7	13	33	10	100	30	10	061980	-	ST-M M7x30	050932
M8x30	30	8	12	33	10	100	30	10	062050	050790	ST-M M8x30	050923
M10x30	30	10	11	33	12	100	30	22	-	050799	ST-M M10x30	051015
M10x40	40	10	15	43	12	100	40	22	062060	050791	ST-M M10x40	050924
M12x50	50	12	21	54	15	100	50	36	062070	050792	ST-M M12x50	050925
M16x65	65	16	28	70	20	130	65	80	062080	050793	ST-M M16x65	050926

### APPLICATION

- Ventilation ducts
- Suspended ceilings
- Cable tray

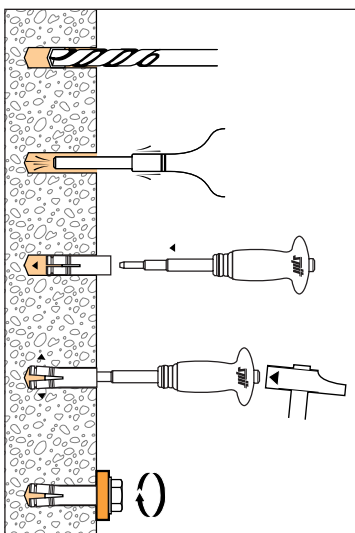
### MATERIAL

- **Anchor sleeve:** M6 to M16 - Steel, 11 SMnPb30
- **Tapered expansion plug:** M6 to M16 : FB10, NF A 35-053
- **protection:** galvanised 5mm mini

### Anchor mechanical properties

	M6	M8	M10	M12	M16
<b>f<sub>uk</sub></b> (N/mm <sup>2</sup> ) Min. tensile strength	570	570	570	570	550
<b>f<sub>yk</sub></b> (N/mm <sup>2</sup> ) Yield strength	420	375	375	345	345
<b>As</b> (mm <sup>2</sup> ) Stressed cross-section	26,34	36,22	47,15	80	138,74

### INSTALLATION



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The loads specified on this page allow judging the product's performances, but cannot be used for the designing. The data given in the pages "CC method" have to be applied.

### 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	M6	M6	M8	M10	M10	M12	M16
<b>Screw grade 8.8</b>							
$h_{ef}$	25	30	30	30	40	50	65
$N_{Ru,m}$	7,8	10,5	13,4	14,9	18,4	31,2	37,1
$N_{Rk}$	5,6	8,5	9,4	8,5	14,5	26,2	29,8

#### SHEAR

Anchor size	M6	M8	M10	M12	M16
<b>Screw grade 8.8</b>					
$V_{Ru,m}$	9	14,8	22,3	27,1	58,3
$V_{Rk}$	4,5	8,7	13,2	14,8	45,8

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

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

\*Derived from test results

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

#### TENSILE

Anchor size	M6	M6	M8	M10	M10	M12	M16
<b>Screw grade 8.8</b>							
$h_{ef}$	25	30	30	30	40	50	65
$N_{Rd}$	3,1	4,7	5,2	4,7	8,1	14,6	16,6

$\gamma_{Mc} = 1,8$

#### SHEAR

Anchor size	M6	M8	M10	M12	M16
<b>Screw grade 8.8</b>					
$V_{Rd}$	3,3	5,7	8,7	9,0	28,8

$\gamma_{Ms} = 1,25$

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

$$N_{Rec} = \frac{N_{Rk}^*}{\gamma_M \cdot \gamma_F}$$

\*Derived from test results

$$V_{Rec} = \frac{V_{Rk}^*}{\gamma_M \cdot \gamma_F}$$

#### TENSILE

Anchor size	M6	M6	M8	M10	M10	M12	M16
<b>Screw grade 8.8</b>							
$h_{ef}$	25	30	30	30	40	50	65
$N_{Rec}$	2,2	3,4	3,7	3,4	5,8	10,4	11,8

$\gamma_F = 1,4$  ;  $\gamma_{Mc} = 1,8$

#### SHEAR

Anchor size	M6	M8	M10	M12	M16
<b>Screw grade 8.8</b>					
$V_{Rec}$	2,4	4,1	6,2	6,4	20,6

$\gamma_{Ms} = 1,25$

### Recommended loads in beam slab in kN

	Hollow concrete slab TYPE DSL 20* (wall thickness: 25 mm)			Hollow concrete slab TYPE DSL 27* (wall thickness: 30 mm)			
	$N_{rec}$	$V_{rec}$		$N_{rec}$		$V_{rec}$	
<b>Mini steel quality of screw</b>	5,6	5,6	8,8	5,6	8,8	5,6	8,8
<b>GRIP L M6X30</b>	2,10	1,25	2,00	2,50	2,70	1,25	2,20
<b>GRIP L M8X30</b>	2,10	2,30	3,10	2,70	2,70	2,30	3,10
<b>GRIP L M10X30</b>	2,10	3,60	4,60	3,40	3,40	3,60	4,60
<b>GRIP L M10X40</b>	N.A.	N.A.	N.A.	3,90	3,90	3,60	4,60

\* kp1 trade mark (supplier for hollow concrete slab)

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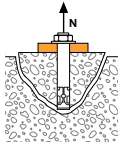
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## SPIT CC- Method (values issued from ETA)

### TENSILE in kN

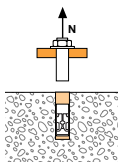


#### Concrete cone resistance

$$N_{Rd,c} = N_{Rd,c}^0 \cdot f_b \cdot \Psi_s \cdot \Psi_{c,N}$$

$N_{Rd,c}^0$ Anchor size	M6	M8	M10	M10	M12	M16
$h_{ef}$	30	30	30	40	50	65
$N_{Rd,c}^0$	4,6	4,6	4,6	7,1	9,9	14,7

$\gamma_{Mc} = 1,8$



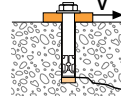
#### Steel resistance

$N_{Rd,s}$ Anchor size	M6	M8	M10	M10	M12	M16
<b>Screw grade 4.6</b>						
$N_{Rd,s}$	4,0	7,3	11,6	11,6	16,9	31,4
<b>Screw grade 5.6</b>						
$N_{Rd,s}$	5,1	9,2	14,5	14,5	21,1	39,3
<b>Screw grade 5.8</b>						
$N_{Rd,s}$	6,7	11,3	14,8	14,8	23,0	39,9
<b>Screw grade 8.8</b>						
$N_{Rd,s}$	9,2	11,3	14,8	14,8	23,0	39,9

$\gamma_{Ms} = 2$  for screw grade 4.6 and 5.6

$1,5 < \gamma_{Ms} < 1,98$  for screw grade 5.8 and 8.8 (cf. ETA)

### SHEAR in kN

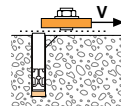


#### Concrete edge resistance

$$V_{Rd,c} = V_{Rd,c}^0 \cdot f_b \cdot f_{\beta,V} \cdot \Psi_{S-C,V}$$

$V_{Rd,c}^0$ Anchor size	M6	M8	M10	M10	M12	M16
$h_{ef}$	30	30	30	40	50	65
$S_{min}$	60	70	80	95	125	130
$C_{min}$	105	105	140	140	195	227
$V_{Rd,c}^0$	6,9	7,4	12,0	12,8	23,4	33,8

$\gamma_{Mc} = 1,8$



#### Steel resistance

$V_{Rd,s}$ Anchor size	M6	M8	M10	M10	M12	M16
<b>Screw grade 4.6</b>						
$V_{Rd,s}$	2,4	4,4	6,9	6,9	10,1	18,8
<b>Screw grade 5.6</b>						
$V_{Rd,s}$	3,0	5,5	8,7	8,7	12,6	23,5
<b>Screw grade &gt; 5.8</b>						
$V_{Rd,s}$	3,1	6,8	8,8	8,8	13,8	24,0

$\gamma_{Ms} = 1,67$  for screw grade 4.6 and 5.6

$1,36 < \gamma_{Ms} < 1,65$  for screw grade 5.8 (cf. ETA)

$$N_{Rd} = \min(N_{Rd,p}; N_{Rd,c}; N_{Rd,s})$$

$$\beta_N = N_{Sd} / N_{Rd} \leq 1$$

$$V_{Rd} = \min(V_{Rd,c}; V_{Rd,s})$$

$$\beta_V = V_{Sd} / V_{Rd} \leq 1$$

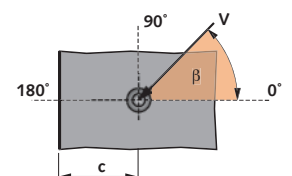
$$\beta_N^{1,5} + \beta_V^{1,5} \leq 1$$

### $f_B$ INFLUENCE OF CONCRETE

Concrete class	$f_B$	Concrete class	$f_B$
C25/30	1,1	C40/50	1,41
C30/37	1,22	C45/55	1,48
C35/45	1,34	C50/60	1,55

### $f_{\beta,V}$ INFLUENCE OF SHEAR LOADING DIRECTION

Angle $\beta$ [°]	$f_{\beta,V}$
0 to 55	1
60	1,1
70	1,2
80	1,5
90 to 180	2



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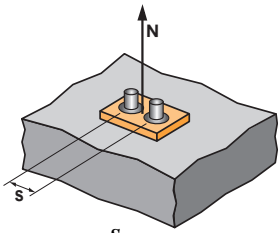
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## SPIT CC- Method (values issued from ETA)

### $\Psi_s$ INFLUENCE OF SPACING FOR CONCRETE CONE RESISTANCE IN TENSILE LOAD



$$\Psi_s = 0,5 + \frac{s}{6 \cdot h_{ef}}$$

$s_{min} < s < s_{cr,N}$

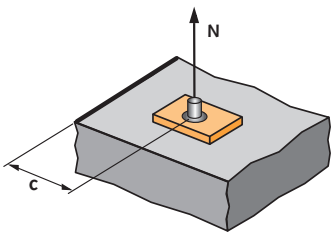
$s_{cr,N} = 3 \cdot h_{ef}$

$\Psi_s$  must be used for each spacing influenced the anchors group.

#### SPACING S

	Reduction factor $\Psi_s$ Non-cracked concrete					
	M6	M8	M10	M10	M12	M16
$h_{ef}$	30	30	30	40	50	65
60	0,83					
70	0,89					
80	0,94	0,94	0,94			
95	1,00	1,00	1,00	0,90		
110				0,96		
125				1,00	0,92	
130					0,93	0,83
150					1,00	0,88
180						0,96
195						1,00

### $\Psi_{c,N}$ INFLUENCE OF EDGE FOR CONCRETE CONE RESISTANCE IN TENSILE LOAD



$c_{min} < c < c_{cr,N}$

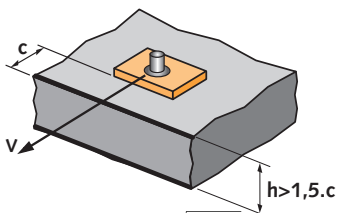
$c_{cr,N} = 1,5 \cdot h_{ef}$

$\Psi_{c,N}$  must be used for each distance influenced the anchors group.

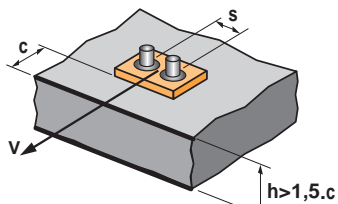
#### EDGE C

	Reduction factor $\Psi_{c,N}$ Non-cracked concrete					
	M6	M8	M10	M10	M12	M16
$h_{ef}$	30	30	30	40	50	65
105	1,00	1,00				
140			1,00	1,00		
195					1,00	
227						1,00

### $\Psi_{s-c,V}$ INFLUENCE OF SPACING AND EDGE DISTANCE FOR CONCRETE EDGE RESISTANCE IN SHEAR LOAD



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



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

#### 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

#### For 2 anchors fastening

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

$\frac{s}{c_{min}}$	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
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 other case of fastenings

$$\Psi_{s-c,V} = \frac{3 \cdot c + s_1 + s_2 + s_3 + \dots + s_{n-1}}{3 \cdot n \cdot c_{min}} \cdot \sqrt{\frac{c}{c_{min}}}$$

