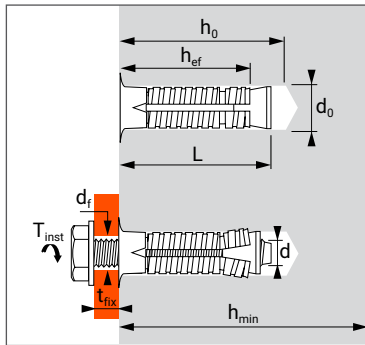




High expansion shield anchor, for use in concrete and solid & hollow masonries and hollow concrete slab



TECHNICAL DATA

RANGE	Min. anchor depth	Max.thick of part to be fixed	Thread diameter	Drilling depth	Drilling diameter	Min. thick of base material	Clearance diameter	Total anchor length	Tighten torque			Code
									Concrete		Bricks	
									screw 5.8	screw 8.8		
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(Nm)	(Nm)		
	h _{ef}	t _{fix}	d	h ₀	d ₀	h _{min}	d _f	L	T _{inst}	T _{inst}	T _{inst}	
SHIELD ONLY												
M6X50	37	-	M6	60	12	100	8	50	8	10	5	050399
M8X55	42	-	M8	65	14	100	10	55	15	25	7,5	050401
M10X65	52	-	M10	75	16	100	12	65	30	50	13	050402
M12X80	62	-	M12	90	20	125	14	80	50	80	23	073560

TYPE B (SUPPLIED WITH SCREW GRADE 8.8 AND PREMOUNTED WASHER)

M6X50/10 B	37	10	M6	60	12	100	8	60	-	10	5	050404
M6X50/25 B		25						70				
M8X55/10 B	42	10	M8	65	14	100	10	60	-	25	7,5	050406
M8X55/25 B		25						80				050407
M8X55/40 B		40						90				050408
M10X65/10 B	52	10	M10	75	16	100	12	75	-	50	13	073640
M10X65/25 B		25						90				073650
M10X65/50 B		50						110				073660
M12X80/10 B	62	10	M12	90	20	125	14	90	-	80	23	073680
M12X80/25 B		25						110				073690

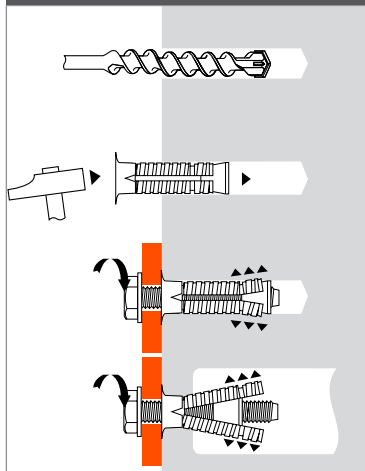
CHARACTERISTICS



APPLICATION

- Industrial doors
- Storage racking
- Signs
- Security shutters
- Gate & fence posts
- Spiral staircase

INSTALLATION



ANCHOR MECHANICAL PROPERTIES

SIZE	M6	M8	M10	M12
Screw grade 5.8				
f_{uk} [N/mm ²] Min. tensile strength	520	520	520	520
f_{yk} [N/mm ²] Yield strength	420	420	420	420
$M^{0}_{Rk,s}$ [Nm] Characteristic bending moment	7,9	19,5	38,9	68,1
M [Nm] Recommended bending moment	3,2	7,8	15,6	28,4
As [mm ²] Stressed cross-section	20,1	36,6	58	84,3
Wel [mm ²] Elastic section modulus	12,7	31,2	62,3	109,2
Screw grade 8.8				
f_{uk} [N/mm ²] Min. tensile strength	800	800	800	800
f_{yk} [N/mm ²] Yield strength	640	640	640	640
$M^{0}_{Rk,s}$ [Nm] Characteristic bending moment	12,2	30,0	59,8	104,8
M [Nm] Recommended bending moment	5,0	12,4	24,8	43,7
As [mm ²] Stressed cross-section	20,1	36,6	58	84,3
Wel [mm ²] Elastic section modulus	12,7	31,2	62,3	109,2
SW [mm] Key size	10	13	17	19

MINIMUM THICKNESS OF CONCRETE, CHARACTERISTIC & MINIMUM DISTANCES FOR SPACING, EDGE

SIZE	M6	M8	M10	M12
Embedment depth	h_{nom} [mm] 37	42	52	62
Minimum thickness of base material	h_{min} [mm] 100	100	100	100
Characteristic edge and spacing distance for full anchor capacity	NON CRACKED CONCRETE	$C_{cr} \geq$ [mm] 55	63	78
		$S_{cr} \geq$ [mm] 110	126	156
	MASONRIES	$C_{cr} \geq$ [mm] 200	200	200
		$S_{cr} \geq$ [mm] 200	200	200
Minimum distances	NON CRACKED CONCRETE	C_{min} [mm] 50	55	60
		S_{min} [mm] 60	70	80



CHARACTERISTIC RESISTANCES [kN]

Characteristic resistances are shown as informative, and have to be used by application of safety factors.

TENSILE					
NON-CRACKED CONCRETE – C20/25					
SIZE		M6	M8	M10	M12
h_{ef}	[mm]	37	42	52	62
$N_{Rk,p}$	[kN]	10,5	13,4	18,4	24,0

MASONRIES					
SIZE		M6	M8	M10	M12
h_{ef}	[mm]	37	42	52	62
Engineering clay bricks BP 300 (fb > 30 N/mm²)					
N_{Rk}	[kN]	7,6	9,6	12,0	12,0
Clay bricks (fb = 11 N/mm²)					
N_{Rk}	[kN]	2,8	4,4	4,4	8,0
Solid concrete blocks B 120 (fb = 13,5 N/mm²)					
N_{Rk}	[kN]	1,6	3,8	5,0	7,6
Hollow clay bricks not rendered					
N_{Rk}	[kN]	0,6	0,6	-	-
Hollow clay bricks rendered					
N_{Rk}	[kN]	4,8	4,8	4,8	4,8
Hollow concrete blocks not rendered					
N_{Rk}	[kN]	0,8	0,8	-	-
Hollow concrete blocks rendered					
N_{Rk}	[kN]	5,0	7,0	7,4	8,8

SHEAR					
NON-CRACKED CONCRETE – C20/25 to C50/60					
SIZE		M6	M8	M10	M12
h_{ef}	[mm]	37	42	52	62
Screw grade 8.8					
$V_{Rk,s}$	[kN]	<u>8,1</u>	<u>14,6</u>	<u>23,3</u>	<u>33,0</u>
Screw grade 5.8					
$V_{Rk,s}$	[kN]	<u>5,2</u>	<u>9,5</u>	<u>15,1</u>	<u>21,9</u>

MASONRIES					
SIZE		M6	M8	M10	M12
h_{ef}	[mm]	37	42	52	62
Engineering clay bricks BP 300 (fb > 30 N/mm²)					
V_{Rk}	[kN]	4,0	7,6	12,0	17,6
Clay bricks (fb = 11 N/mm²)					
V_{Rk}	[kN]	3,4	7,6	12,0	17,6
Solid concrete blocks B 120 (fb = 13,5 N/mm²)					
V_{Rk}	[kN]	2,0	7,0	8,8	12,6
Hollow clay bricks not rendered					
V_{Rk}	[kN]	2,0	2,0	-	-
Hollow clay bricks rendered					
V_{Rk}	[kN]	6,4	8,0	10,0	12,0
Hollow concrete blocks not rendered					
V_{Rk}	[kN]	3,2	3,2	-	-
Hollow concrete blocks rendered					
V_{Rk}	[kN]	6,4	8,0	10,0	12,0

RECOMMENDED LOADS OF ONE ANCHOR WITHOUT INFLUENCE OF SPACING & CONCRETE EDGE [kN]

Recommended values are given for spacing $\geq S_{cr}$ and edge distance $\geq C_{cr}$.

TENSILE					
NON-CRACKED CONCRETE – C20/25					
SIZE		M6	M8	M10	M12
h_{ef}	[mm]	37	42	52	62
N_{Rec}	[kN]	3,6	4,6	6,3	8,2
$N_{Rec} = N_{Rd,uncr} / \gamma_F ; \gamma_F = 1,4$					

MASONRIES					
SIZE		M6	M8	M10	M12
h_{ef}	[mm]	37	42	52	62
Engineering clay bricks BP 300 ($f_b > 30 \text{ N/mm}^2$)					
N_{Rec}	[kN]	1,90	2,40	3,00	3,00
Clay bricks ($f_b = 11 \text{ N/mm}^2$)					
N_{Rec}	[kN]	0,70	1,10	1,10	2,00
Solid concrete blocks B 120 ($f_b = 13,5 \text{ N/mm}^2$)					
N_{Rec}	[kN]	0,40	0,95	1,25	1,90
Hollow clay bricks not rendered					
N_{Rec}	[kN]	0,15	0,15	-	-
Hollow clay bricks rendered					
N_{Rec}	[kN]	1,20	1,20	1,20	1,20
Hollow concrete blocks not rendered					
N_{Rec}	[kN]	0,20	0,20	-	-
Hollow concrete blocks rendered					
N_{Rec}	[kN]	1,25	1,75	1,85	2,20
$N_{Rec} = N_{Rd} / \gamma_F ; \gamma_F = 1,4$					

HOLLOW CONCRETE SLAB (type DSL 20)					
SIZE		M6	M8	M10	M12
h_{ef}	[mm]	37	42	52	62
N_{Rec}	[kN]	2,50	2,75	3,00	-
$N_{Rec} = N_{Rd} / \gamma_F; \gamma_F = 1,4$					

SHEAR					
NON-CRACKED CONCRETE – C20/25 to C50/60					
SIZE		M6	M8	M10	M12
h_{ef}	[mm]	37	42	52	62
Screw grade 8.8					
V_{Rec}	[kN]	<u>4,6</u>	<u>8,4</u>	<u>13,3</u>	<u>18,9</u>
Screw grade 5.8					
V_{Rec}	[kN]	<u>2,5</u>	<u>4,5</u>	<u>7,2</u>	<u>10,4</u>
$V_{Rec} = V_{Rd,s} / \gamma_F ; \gamma_F = 1,4$					

MASONRIES					
SIZE		M6	M8	M10	M12
h_{ef}	[mm]	37	42	52	62
Engineering clay bricks BP 300 (fb > 30 N/mm²)					
V_{Rec}	[kN]	1,00	1,90	3,00	4,40
Clay bricks (fb = 11 N/mm²)					
V_{Rec}	[kN]	0,85	1,90	3,00	4,40
Solid concrete blocks B 120 (fb = 13,5 N/mm²)					
V_{Rec}	[kN]	0,50	1,75	2,20	3,15
Hollow clay bricks not rendered					
V_{Rec}	[kN]	0,50	0,50	-	-
Hollow clay bricks rendered					
V_{Rec}	[kN]	1,60	2,00	2,50	3,00
Hollow concrete blocks not rendered					
V_{Rec}	[kN]	0,80	0,80	-	-
Hollow concrete blocks rendered					
V_{Rec}	[kN]	1,60	2,00	2,50	3,00
$V_{Rec} = V_{Rd} / \gamma_F ; \gamma_F = 1,4$					

HOLLOW CONCRETE SLAB (type DSL 20)				
SIZE	M6	M8	M10	M12
h_{ef} [mm]	37	42	52	62
Screw grade 8.8				
V_{Rec} [kN]	2,10	3,90	6,20	-
Screw grade 5.8				
V_{Rec} [kN]	1,40	2,50	4,00	-
$V_{Rec} = V_{Rds} / \gamma_F; \gamma_F = 1,4$				

Nota: The values indicated *in italics and underlined* correspond to steel failure



Design resistances for static and fire loads are given for spacing $\geq S_{cr}$ and edge distance $\geq C_{cr}$.

For project with reduced spacing and edge distance, we recommend to use SPIT i-Expert software to design your project according to EN 1992-4.

DESIGN RESISTANCE FOR STATIC LOADS IN NON-CRACKED CONCRETE [kN]

TENSILE				
SIZE	M6	M8	M12	M16
h_{ef} [mm]	37	42	52	62
$N_{Rd,uncr}$ [kN]	C20/25 5,0	6,4	8,8	11,4
	C40/50 5,1	9,0	12,4	16,2

Distances S_{cr} and C_{cr} must be fulfilled

$$N_{Rd,uncr} = \min[N_{Rk,p,uncr} / \gamma_{Mc}; N_{Rk,s} / \gamma_{Ms,N}]$$

$$\gamma_{Mc} = 2,1; \gamma_{Ms,N} = 1,5$$

SHEAR				
SIZE	M6	M8	M12	M16
h_{ef} [mm]	37	42	52	62
Screw grade 8.8				
$V_{Rd,s}$ [kN]	6,5	11,7	18,6	26,4
Screw grade 5.8				
$V_{Rd,s}$ [kN]	4,2	7,6	12,1	17,5
$V_{Rd,s} = V_{Rk,s} / \gamma_{Ms,V}$				
$\gamma_{Ms,V} = 1,25$				

DESIGN RESISTANCE FOR STATIC LOADS IN MASONRIES [kN]

TENSILE				
SIZE	M6	M8	M10	M12
h_{ef} [mm]	37	42	52	62
Engineering clay bricks BP 300 ($f_b > 30$ N/mm²)				
N_{Rd} [kN]	2,60	3,30	4,20	4,20
Clay bricks ($f_b = 11$ N/mm²)				
N_{Rd} [kN]	1,00	1,50	1,50	2,80
Solid concrete blocks B 120 ($f_b = 13,5$ N/mm²)				
N_{Rd} [kN]	0,55	1,30	1,30	2,60
Hollow clay bricks not rendered				
N_{Rd} [kN]	0,20	0,20	-	-
Hollow clay bricks rendered				
N_{Rd} [kN]	1,70	1,70	1,70	1,70
Hollow concrete blocks not rendered				
N_{Rd} [kN]	0,28	0,28	-	-
Hollow concrete blocks rendered				
N_{Rd} [kN]	1,75	2,45	2,60	3,10

Distances S_{cr} and C_{cr} must be fulfilled

$$N_{Rd} = N_{Rk} / \gamma_M; \gamma_M = 2,5$$

SHEAR				
SIZE	M6	M8	M10	M12
h_{ef} [mm]	37	42	52	62
Engineering clay bricks BP 300 ($f_b > 30$ N/mm²)				
V_{Rd} [kN]	1,40	2,60	4,20	6,20
Clay bricks ($f_b = 11$ N/mm²)				
V_{Rd} [kN]	1,20	2,60	4,20	6,20
Solid concrete blocks B 120 ($f_b = 13,5$ N/mm²)				
V_{Rd} [kN]	0,70	2,45	3,10	4,20
Hollow clay bricks not rendered				
V_{Rd} [kN]	0,70	0,70	-	-
Hollow clay bricks rendered				
V_{Rd} [kN]	2,20	2,80	3,50	4,20
Hollow concrete blocks not rendered				
V_{Rd} [kN]	1,10	1,10	-	-
Hollow concrete blocks rendered				
V_{Rd} [kN]	2,20	2,80	3,50	4,20

$$V_{Rd} = V_{Rk} / \gamma_M; \gamma_M = 2,5$$

DESIGN RESISTANCE FOR STATIC LOADS IN HOLLOW CONCRETE SLAB [kN]

TENSILE				
SIZE	M6	M8	M10	M12
h_{ef} [mm]	37	42	52	62
N_{Rd} [kN]	3,50	3,85	4,20	-

Distances S_{cr} and C_{cr} must be fulfilled

SHEAR				
SIZE	M6	M8	M10	M12
h_{ef} [mm]	37	42	52	62
Screw grade 8.8				
V_{Rd} [kN]	2,90	5,40	8,70	-
Screw grade 5.8				
V_{Rd} [kN]	2,00	3,50	5,60	-

DESIGN RESISTANCE FOR FIRE EXPOSURE [kN]

TENSILE				
SIZE	M6	M8	M12	M16
h_{ef} [mm]	37	42	52	62
$N_{Rd,fi}$ R30 [kN]	-	1,09	1,20	1,20
$N_{Rd,fi}$ R60 [kN]	-	0,89	1,10	1,10
$N_{Rd,fi}$ R90 [kN]	-	0,68	1,04	1,04
$N_{Rd,fi}$ R120 [kN]	-	0,58	1,00	1,00

$$N_{Rd,fi} = N_{Rk,s,fi} / \gamma_{M,fi}$$

$$\gamma_{M,fi} = 1,0$$

SHEAR				
SIZE	M6	M8	M12	M16
h_{ef} [mm]	37	42	52	62
$V_{Rd,fi}$ R30 [kN]	-	1,09	1,20	1,20
$V_{Rd,fi}$ R60 [kN]	-	0,89	1,10	1,10
$V_{Rd,fi}$ R90 [kN]	-	0,68	1,04	1,04
$V_{Rd,fi}$ R120 [kN]	-	0,58	1,00	1,00

$$V_{Rd,fi} = V_{Rk,s,fi} / \gamma_{M,fi}$$

$$\gamma_{M,fi} = 1,0$$

Nota: The values indicated in *italics and underlined* correspond to steel failure