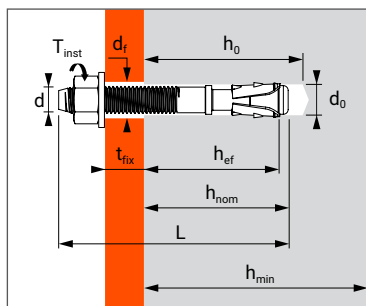




Torque controlled expansion anchor, for use in non-cracked concrete



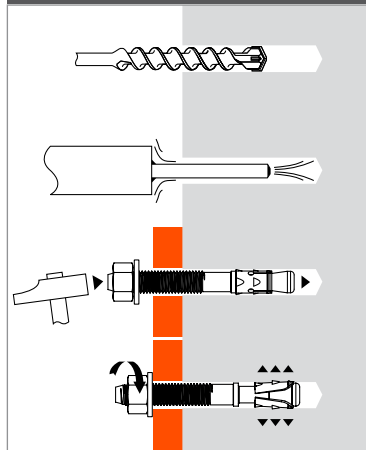
CHARACTERISTICS



APPLICATION

- Steel and timber framework and beams
- Lift guide rails
- Industrial doors and gates
- Brickwork support angles
- Storage systems

INSTALLATION



TECHNICAL DATA

RANGE	Letter marking	Maximum anchorage depth					Minimum anchorage depth					Thread	Drilling	Clearance	Total anchor length	Tighten torque	Code
		Max. anchor depth (mm) h _{ef}	Embed. depth (mm) h _{nom}	Max. thick. of part to be fixed (mm) t _{fix}	Drilling depth (mm) h ₀	Min. thick. of base material (mm) h _{min}	Min. anchor depth (mm) h _{ef}	Embed. depth (mm) h _{nom}	Max. thick. of part to be fixed (mm) t _{fix}	Drilling depth (mm) h ₀	Min. thick. of base material (mm) h _{min}	(mm) d	(mm) d ₀	(mm) d _f	(mm) L	(Nm) T _{inst}	
6X45/5*	-			-					5						45		050510
6X55/15*	-	35	45	5	51	100	25,6	35	15	41	100	6	6	8	55	10	050520
6X85/45*	-			35					45						85		050530
8X55/5	-			-					5						55		057450
8X70/20-10	C			10					20						70		057451
8X90/40-30	E			30					40						90		057452
8X100/50-40	F	40	48	40	60	80	30	38	50	50	80	8	8	9	100	15	057453
8X115/65-55	G			55					65						115		057454
8X130/80-70	H			70					80						130		057455
8X160/110-100	J			100					110						160		057456
10X65/5	-			-					5						65		057460
10X75/15-5	C			5					15						75		057461
10X85/25-15	D			15					25						85		057462
10X95/36-26	E			26					36						95		057463
10X110/50-40	F	50	60	40	70	100	40	50	50	60	100	10	10	12	110	30	057464
10X125/65-55	G			55					65						125		057465
10X140/80-70	I			70					80						140		057466
10X160/100-90	J			90					100						160		057467
12X80/5	-			-					5						80		057470
12X100/25-10	F			10					25						100		057471
12x115/40-25	G			25					40						115		057472
12x125/50-35	H			35					50						125		057473
12X140/65-50	I	65	77	50	90	130	50	62	65	75	100	12	12	14	140	50	057474
12X160/85-70	J			70					85						160		057664
12X180/105-90	L			90					105						180		057576
12X220/145-130	O			130					145						220		057477
16X100/5	-			-					5						100		057480
16X125/30-15	G			15					30						125		057481
16X150/55-40	I			40					55						150		057482
16X170/75-60	K	80	95	60	110	160	65	80	75	95	130	16	16	18	170	100	057483
16X185/90-75	L			75					90						185		057484
16X235/140-125*	-			125					140						235		057485
20X150/10	-			-					10						150		057490
20X170/30	K	-	-	-	-	-	100	113	30	130	200	20	20	22	170	160	057491
20X220/80	O			-					80						220		057492
Large Washer (LW)																	
12X300/200*	-	70	80	200	90	140	-	-	-	-	-	12	12	14	300	60	057673
16X300/205-190*	-	85	98	205	110	170	65	78	190	90	130	16	16	18	300	110	057675

* Do not belong to ETA

Washer	Standard (NF E 25513)					Large (DIN 440 / ISO 7094)	
SIZE	M8	M10	M12	M16	M20	M12	M16
Outer Ø [mm]	16	20	24	30	37	44	56
Thickness [mm]	1,6	2,0	2,5	3,0	3,0	4,0	5,0

ANCHOR MECHANICAL PROPERTIES

SIZE	M6	M8	M10	M12	M16	M20
Cross-section above cone						
f _{uk} [N/mm ²] Min. tensile strength	700	750	750	750	700	600
f _{yk} [N/mm ²] Yield strength	580	600	600	600	570	580
As [mm ²] Stressed cross-section	-	23,8	34,7	56,1	103,9	165,1
Threaded part						
f _{uk} [N/mm ²] Min. tensile strength	600	650	650	650	600	500
f _{yk} [N/mm ²] Yield strength	420	420	420	420	480	410
As [mm ²] Stressed cross-section	20,1	36,6	58	84,3	157	245
W _{el} [mm ³] Elastic section modulus	12,7	31,2	62,3	109,2	277,5	540,9
M ⁰ _{Rk,s} [Nm] Characteristic bending moment	9	24	49	85	200	315,7
M [Nm] Recommended bending moment	3,7	9,8	20,0	34,7	81,6	90,5
SW [mm] Key size	10	13	17	19	24	30



FIX3

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

SIZE			M8	M10	M10	M12	M12	M16	M16	M20
Anchorage depth	h_{ef}	[mm]	40	40	50	50	65	65	80	100
Minimum thickness of base material	h_{min}	[mm]	100	100	100	100	130	130	160	200
Characteristic edge and spacing distance for full anchor capacity	$C_{cr} \geq$	[mm]	60	60	75	75	97,5	97,5	120	150
	$S_{cr} \geq$	[mm]	120	120	150	150	195	195	240	300
Minimum distances for non-cracked concrete	S_{min}	[mm]	45	50	60	100	70	100	90	130
	C_{min}	[mm]	55	65	65	100	70	100	105	120

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	M16	M20
$h_{ef,1}$ [mm]	25	30	40	50	65	-
$N_{Rk,p}$ [kN]	3,6	7,5	12,4	17,4	25,8	-
$h_{ef,2}$ [mm]	35	40	50	65	80	100
$N_{Rk,p}$ [kN]	5,7	12,4	17,4	25,8	35,2	49,2

SHEAR

NON-CRACKED CONCRETE - C20/25 to C50/60

SIZE	M6	M8	M10	M12	M16	M20
$h_{ef,1}$ [mm]	25	30	40	50	65	-
$h_{ef,2}$ [mm]	35	40	50	65	80	100
$V_{Rk,s}$ [kN]	3,6	<u>10,0</u>	<u>13,7</u>	<u>27,4</u>	<u>36,5</u>	<u>61,0</u>

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

Recommended values are determined from performances given in the ETA, and are guaranteed for spacing $\geq S_{cr}$ and edge distance $\geq C_{cr}$.

TENSILE

NON-CRACKED CONCRETE - C20/25

SIZE	M6	M8	M10	M12	M16	M20
$h_{ef,1}$ [mm]	25	30	40	50	65	-
N_{Rec} [kN]	1,7	3,6	5,9	8,3	12,3	-
$h_{ef,2}$ [mm]	35	40	50	65	80	100
N_{Rec} [kN]	2,7	5,9	8,3	12,3	16,8	23,4

$$N_{Rec} = \min [N_{Rd,p}; N_{Rd,c}; N_{Rd,s}] / \gamma_F; \gamma_F = 1,4$$

SHEAR

NON-CRACKED CONCRETE - C20/25 to C50/60

SIZE	M6	M8	M10	M12	M16	M20
$h_{ef,1}$ [mm]	25	30	40	50	65	-
$h_{ef,2}$ [mm]	35	40	50	65	80	100
V_{Rec} [kN]	1,7	<u>5,7</u>	<u>7,8</u>	<u>15,7</u>	<u>20,9</u>	<u>29,0</u>

$$V_{Rec} = V_{Rd,s} / \gamma_F; \gamma_F = 1,4$$

Design resistances for static loads are determined from performances given in the ETA, and are guaranteed 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	M10	M12	M16	M20
$h_{ef,1}$ [mm]	25	30	40	50	65	-
$N_{Rd,uncr}$ [kN]	C20/25	2,4	5,0	8,3	11,6	17,2
	C40/50	2,4	7,1	11,7	16,4	24,3
$h_{ef,2}$ [mm]	35	40	50	65	80	100
$N_{Rd,uncr}$ [kN]	C20/25	3,8	8,3	11,6	17,2	23,5
	C40/50	3,8	11,7	16,4	24,3	33,2

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

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

$$\gamma_{Mc} = 1,5; M8-M12: \gamma_{Ms,N} = 1,5; M16: \gamma_{Ms,N} = 1,47; M20: \gamma_{Ms,N} = 1,5$$

SHEAR

SIZE	M6	M8	M10	M12	M16	M20
$h_{ef,1}$ [mm]	25	30	40	50	65	-
$h_{ef,2}$ [mm]	35	40	50	65	80	100
$V_{Rd,s}$ [kN]	2,4	<u>8,0</u>	<u>11,0</u>	<u>21,9</u>	<u>29,2</u>	<u>40,7</u>

$$V_{Rd,s} = V_{Rk,s} / \gamma_{Ms,V}$$

$$M8-M16: \gamma_{Ms,V} = 1,25; M20: \gamma_{Ms,V} = 1,5$$

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

