

TUC OPT 1 CONCRETE BOLT

Features:

- Through fixing
- Approved for cracked and non-crack concrete
- Rapid Installation
- Hardened Steel with Zinc Plating, minimum 5um
- Fire tested class A1 resistant

Benefits:

- Quick and simple installation
- One anchor for concrete from C20/25 to C50/60
- Adjustable fixture thickness
- Removable for use with temporary structures



Concrete Ranges: C20/C25 according to EN 206:2013+A1:2016

Certification: European technical assessment 24/0522 & 24/0523

Product Range

Product Code	Thread Diameter	Anchor Length	Drill Hole Diameter	Minimum Drill Hole Depth	Maximum Fixture Thickness	Fixture Clearance Hole	Hex Head
	d	L	d _o	h _{nom}	t _{fix}	d _f	A/F
	mm	mm	mm	mm	mm	mm	mm
T C06050	8	50	6	45	15	10	10
T C06075		75			40		
T C06100		100			65		
T C06130		130			95		
T C06150		150			115		
T C08060	10	60	8	60	5	12	13
T C08075		75			20		
T C08100		100			45		
T C10060	12	60	10	65	5	14	15
T C10075		75			20		
T C10100		100			45		
T C10125		125			70		
T C10140		140			85		
T C10150		150			95		
T C12075	14	75	12	75	10	16	16
T C12100		100			35		
T C12120		120			55		
T C12130		130			65		
T C12150	16	150	14	95	85	18	18
T C14100		100			15		
T C14120		120			35		
T C14130		130			45		
T C14150	18	150	16	100	65	20	21
T C16100		100			5		
T C16150		150			20		
T C16200		200			45		

Installation Data

Anchor Diameter			M6		M8		M10			M12			M14			M16	
Nominal Embedment Depth	h_{nom}	[mm]	44	55	50	65	55	65	85	65	85	100	85	100	115	100	120
Effective Embedment Depth	h_{eff}	[mm]	30	41	34	47	37	45	62	44	61	73	60	72	85	71	88
Minimum Concrete Thickness	h_{min}	[mm]	80	80	80	80	80	90	120	100	120	150	120	150	150	150	150
Minimum Spacing	s_{min}	[mm]	35	35	35	35	40	40	40	50	50	50	60	60	60	70	70
Minimum Edge Distance	c_{min}	[mm]	35	35	35	35	40	40	40	50	50	50	60	60	60	70	70
Maximum Installation Torque	T_{inst}	[Nm]	150		200		250			350			450			600	
Design Spacing - Tension	$S_{cr,N,ucr}$	[mm]	3 x h_{ef}														
Design Edge Distance - Tension	$C_{cr,N,ucr}$	[mm]	1.5 x h_{ef}														

Load Data

Characteristics Resistance

Anchor Diameter			M6		M8		M10			M12			M14			M16	
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Non-Cracked Concrete

N_{Rk}	Tensile	[kN]	4.0	8.0	8.5	12.0	9.5	12.0	20.0	10.0	15.0	20.0	19.0	28.0	30.0	28.0	36.0
V_{Rk}	Shear without lever arm	[kN]	9.3	12.6	16.3	20.3	27.6	31.2	31.2	34.5	45.4	45.4	59.4	63.0	63.0	80.5	82.7

Design Resistance

Anchor Diameter			M6		M8		M10			M12			M14			M16	
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Non-Cracked Concrete

N_{Rd}	Tensile	[kN]	1.6	3.7	3.4	5.6	3.8	5.6	9.3	4.0	6.9	9.3	8.8	13.0	13.9	13.0	16.7
V_{Rd}	Shear without lever arm	[kN]	6.2	8.4	10.87	13.53	18.4	20.8	20.8	23.0	30.27	30.27	39.6	42.0	42.0	53.67	55.13

Recommended Resistance

Anchor Diameter			M6		M8		M10			M12			M14			M16	
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Non-Cracked Concrete

N_{rec}	Tensile	[kN]	1.1	2.6	2.4	4.0	2.7	4.0	6.6	2.9	5.0	6.6	6.3	9.3	9.9	9.3	11.9
V_{rec}	Shear without lever arm	[kN]	4.4	6.0	7.8	9.7	13.1	14.9	14.9	16.4	21.6	21.6	28.3	30.0	30.0	38.3	39.4

Includes Partial Safety Factor $\gamma = 1.4$ in the absence of national regulations and type of loading Data is for Static and Quasi Static Loads for a single anchor

Characteristics Resistance

Anchor Diameter			M6		M8		M10			M12			M14			M16	
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Cracked Concrete

N_{Rk}	Tensile	[kN]	n/a	4.0	2.5	9.0	4.5	9.0	14.0	7.0	12.0	15.0	14.0	21.0	24.0	15.0	24.0
V_{Rk}	Shear without lever arm	[kN]	9.3	12.6	16.3	20.3	27.6	31.2	31.2	34.5	45.4	45.4	59.4	63.0	63.0	80.5	82.7

Design Resistance

Anchor Diameter			M6		M8		M10			M12			M14			M16	
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Cracked Concrete

N_{Rd}	Tensile	[kN]	n/a	1.6	1.2	3.6	2.1	3.6	6.5	3.2	4.8	6.9	6.5	9.7	11.1	6.9	11.1
V_{Rd}	Shear without lever arm	[kN]	6.2	8.4	10.87	13.53	18.4	20.8	20.8	23.0	30.27	30.27	39.6	42.0	42.0	53.67	55.13

Recommended Resistance

Anchor Diameter			M6		M8		M10			M12			M14			M16	
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Cracked Concrete

N_{rec}	Tensile	[kN]	n/a	1.1	0.8	2.6	1.5	2.6	4.6	2.3	3.4	5.0	4.6	6.9	7.9	5.0	7.9
V_{rec}	Shear without lever arm	[kN]	4.4	6.0	7.8	9.7	13.1	14.9	14.9	16.4	21.6	21.6	28.3	30.0	30.0	38.3	39.4

Includes Partial Safety Factor $\gamma = 1.4$ in the absence of national regulations and type of loading Data is for Static and Quasi Static Loads for a single anchor

⁽¹⁾ Not applicable

Increasing Concrete Factors

Anchor Diameter			M6		M8		M10			M12			M14			M16	
Ψ_c C30/37	[-]		1.09	1.00	1.06	1.09	1.09	1.07	1.08	1.06	1.08	1.06	1.07	1.07	1.07	1.09	1.09
Ψ_c C40/45	[-]		1.16	1.18	1.11	1.17	1.11	1.13	1.13	1.11	1.14	1.1	1.11	1.11	1.12	1.14	1.16
Ψ_c C50/60	[-]		1.21	1.25	1.15	1.23	1.14	1.18	1.18	1.15	1.18	1.13	1.15	1.15	1.19	1.19	1.222

When using increasing factors care must be taken not to exceed steel limits

Steel Failure with lever arm

Anchor Diameter			M6	M8	M10	M12	M14	M16
Cracked and Uncracked Concrete								
$M_{Rk,s}^0$	Characteristic Bending Moment	[Nm]	21.3	44.5	98.3	157.8	265.8	404.4
γ_M	Partial Safety Factor	[-]	1.5					

Characteristic resistance under fire exposure in cracked and uncracked concrete C20/25 to C50/60

Anchor Diameter				M6		M8		M10			M12			M14			M16	
Steel failure for tension and shear loads $F_{Rk,s,fi} = N_{Rk,s,fi} = V_{Rk,s,fi}$																		
Characteristic Resistance	$F_{Rk,s,fi}$	R30	[kN]	0.2	0.2	0.4	0.4	-	1.0	1.0	-	2.0	2.0	2.8	2.8	2.8	3.7	3.7
	$F_{Rk,s,fi}$	R60	[kN]	0.2	0.2	0.4	0.4	-	0.9	0.9	-	1.5	1.5	2.1	2.1	2.1	2.8	2.8
	$F_{Rk,s,fi}$	R90	[kN]	0.2	0.2	0.3	0.3	-	0.7	0.7	-	1.3	1.3	1.8	1.8	1.8	2.4	2.4
	$F_{Rk,s,fi}$	R120	[kN]	0.1	0.1	0.2	0.2	-	0.5	0.5	-	1.0	1.0	1.4	1.4	1.4	1.9	1.9
	$M^0_{Rk,s,fi}$	R30	[Nm]	0.2	0.2	0.5	0.5	-	1.4	1.4	-	3.4	3.4	5.6	5.6	5.6	8.5	8.5
	$M^0_{Rk,s,fi}$	R60	[Nm]	0.2	0.2	0.4	0.4	-	1.3	1.3	-	2.6	2.6	4.2	4.2	4.2	6.4	6.4
	$M^0_{Rk,s,fi}$	R90	[Nm]	0.1	0.1	0.3	0.3	-	1.0	1.0	-	2.2	2.2	3.6	3.6	3.6	5.5	5.5
$M^0_{Rk,s,fi}$	R120	[Nm]	0.1	0.1	0.2	0.2	-	0.8	0.8	-	1.7	1.7	2.8	2.8	2.8	4.3	4.3	
Pull out failure																		
Characteristic Resistance	$N_{Rk,s,fi}$	R30 - R90	[kN]	-	1.0	0.6	2.3	1.1	2.3	3.5	1.8	3.0	3.8	3.5	5.3	6.0	3.8	6.0
	$N_{Rk,s,fi}$	R120	[kN]	-	0.8	0.5	1.8	0.9	1.8	2.8	1.4	2.4	3.0	2.8	4.2	4.8	3.0	4.8
Concrete cone failure																		
Characteristic Resistance	$N_{Rk,s,fi}$	R30 - R90	[kN]	0.8	1.9	1.2	2.6	1.4	2.3	5.2	2.2	5.0	7.8	4.8	7.6	11.5	7.3	12.5
	$N_{Rk,s,fi}$	R120	[kN]	0.7	1.5	0.9	2.1	1.1	1.9	4.1	1.7	4.1	6.2	3.7	6.0	9.1	5.8	10.1
Edge Distance																		
R30 to R120	$C_{Cr,fi}$		[mm]	$2 \times h_{ef}$														
Anchor Spacing																		
R30 to R120	$S_{Cr,fi}$		[mm]	$4 \times h_{ef}$														
Pry-out Factor	k_8		[-]	1.0	1.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

