

R-XPT Throughbolt

Throughbolt for non-cracked concrete



Approvals and Reports

- ETA 17/0183



Product information

Features and benefits

- High performance in non-cracked concrete confirmed by ETA Option 7
- High quality with cost effectiveness
- Suitable for reduced embedment to avoid contact with reinforcement
- Embedment depth markings help to ensure precise installation of the anchor
- Design allows drilling and installing directly through the fixture and helps to reduce installation effort
- Cold formed body ensures consistent dimensional accuracy
- Simple through-installation (drilling and installation through fixed material)
- Optimized expander design with six grip features allows for a high load-bearing capacity

Applications

- Cladding restraint
- Curtain wall
- Balustrading
- Barriers
- Handrails
- Racking
- Structural steel
- Bollards

Base materials

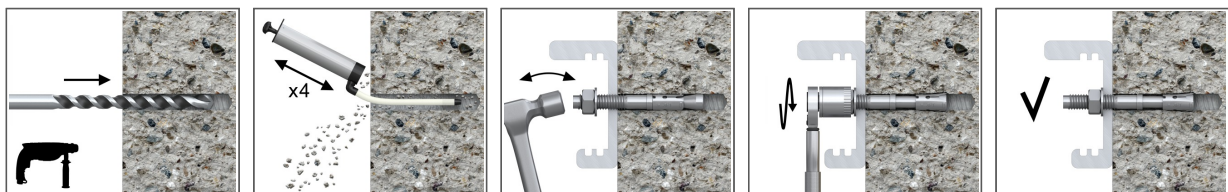
Approved for use in:

- Non-cracked concrete C20/25-C50/60
- Unreinforced concrete
- Reinforced concrete

Also suitable for use in:

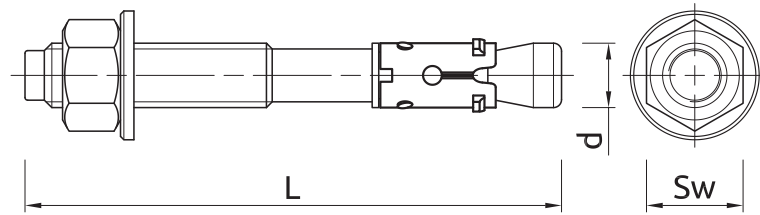
- Natural Stone

Installation guide



1. Drill a hole of required diameter and depth
2. Clear the hole of drilling dust and debris (using blowpump or equivalent method)
3. Lightly tap the throughbolt through the fixture into hole with a hammer, until fixing depth is reached
4. Tighten to the recommended torque

Product information

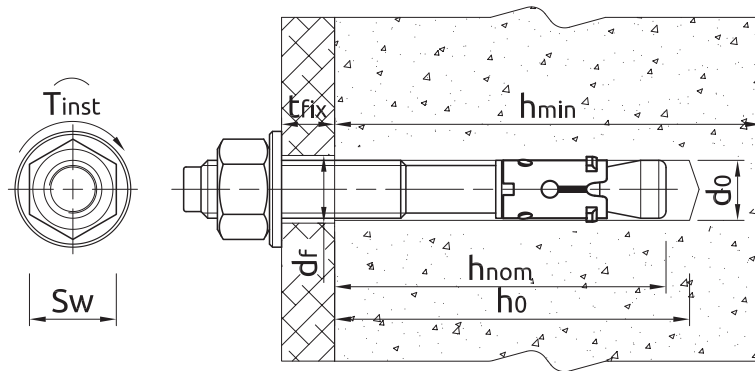


Size	Product Code	Approval type	Anchor		Fixture		
			Diameter	Length	Max. thickness t_{fix} for:		Hole diameter
			d	L	$h_{nom,red}$	$h_{nom,std}$	d_f
		-	[mm]	[mm]	[mm]	[mm]	[mm]
M6	R-XPT-06050/10	AT-15-9327/14	6	50	10	-	7
	R-XPT-06065/5	AT-15-9327/14	6	65	25	5	7
	R-XPT-06085/25	AT-15-9327/14	6	85	45	25	7
	R-XPT-06100/40	AT-15-9327/14	6	100	60	40	7
M8	R-XPT-08050/5	AT-15-9327/14	8	50	5	-	9
	R-XPT-08060/10	ETA-08/0339	8	60	10	-	9
	R-XPT-08065/15	ETA-08/0339	8	65	15	-	9
	R-XPT-08075/10	ETA-08/0339	8	75	25	10	9
	R-XPT-08080/15	ETA-08/0339	8	80	30	15	9
	R-XPT-08085/20	ETA-08/0339	8	85	35	20	9
	R-XPT-08095/30	ETA-08/0339	8	95	45	30	9
	R-XPT-08115/50	ETA-08/0339	8	115	65	50	9
	R-XPT-08140/75	ETA-08/0339	8	140	90	75	9
M10	R-XPT-08150/85	ETA-08/0339	8	150	100	85	9
	R-XPT-10065/5	ETA-08/0339	10	65	5	-	11
	R-XPT-10080/10	ETA-08/0339	10	80	20	10	11
	R-XPT-10085/15	ETA-08/0339	10	85	25	15	11
	R-XPT-10095/25	ETA-08/0339	10	95	35	25	11
	R-XPT-10115/45	ETA-08/0339	10	115	55	45	11
	R-XPT-10130/60	ETA-08/0339	10	130	70	60	11
	R-XPT-10140/70	ETA-08/0339	10	140	80	70	11
	R-XPT-10150/80	ETA-08/0339	10	150	90	80	11
M12	R-XPT-10180/110	ETA-08/0339	10	180	120	110	11
	R-XPT-12080/5	ETA-08/0339	12	80	5	-	13
	R-XPT-12100/5	ETA-08/0339	12	100	25	5	13
	R-XPT-12120/25	ETA-08/0339	12	120	45	25	13
	R-XPT-12125/30	ETA-08/0339	12	125	50	30	13
	R-XPT-12135/40	ETA-08/0339	12	135	60	40	13
	R-XPT-12140/45	ETA-08/0339	12	140	65	45	13
	R-XPT-12150/55	ETA-08/0339	12	150	75	55	13
	R-XPT-12180/85	ETA-08/0339	12	180	105	85	13
M16	R-XPT-12220/125	-	12	220	145	125	13
	R-XPT-12300/205	-	12	300	225	205	13
	R-XPT-16100/5	ETA-08/0339	16	100	5	-	18
	R-XPT-16105/10	ETA-08/0339	16	105	10	-	18
	R-XPT-16125/5	ETA-08/0339	16	125	25	5	18
	R-XPT-16140/20	ETA-08/0339	16	140	40	20	18
	R-XPT-16150/30	ETA-08/0339	16	150	50	30	18
	R-XPT-16160/40	ETA-08/0339	16	160	60	40	18
	R-XPT-16180/60	ETA-08/0339	16	180	80	60	18
M20	R-XPT-16220/100	-	16	220	120	100	18
	R-XPT-16280/160	-	16	280	180	160	18
M20	R-XPT-20125/5	ETA-08/0339	20	125	5	-	22
M20	R-XPT-20160/20	ETA-08/0339	20	160	40	20	22

Product information

Size	Product Code	Approval type	Anchor		Fixture		
			Diameter	Length	Max. thickness t_{fix} for:		Hole diameter
			d	L	$h_{nom,red}$	$h_{nom,std}$	d_f
		-	[mm]	[mm]	[mm]	[mm]	[mm]
M20	R-XPT-20200/60	-	20	200	80	60	22
	R-XPT-20300/160	-	20	300	180	160	22
M24	R-XPT-24180/20	AT-15-9327/14	24	180	35	20	26
	R-XPT-24260/100	AT-15-9327/14	24	260	115	100	26
	R-XPT-24300/140	AT-15-9327/14	24	300	155	140	26

Installation data



Size			M6	M8	M10	M12	M16	M20	M24
Thread diameter	d	[mm]	6	8	10	12	16	20	24
Hole diameter in substrate	d_0	[mm]	6	8	10	12	16	20	24
Installation torque	T_{inst}	[Nm]	5	15	30	50	100	200	300
Wrench size	Sw	[mm]	10	13	17	19	24	30	36
STANDARD EMBEDMENT DEPTH									
Min. hole depth in substrate	$h_{0,s}$	[mm]	55	55	59	80	100	119	140
Installation depth	$h_{nom,s}$	[mm]	50	55	59	80	100	119	135
Min. substrate thickness	$h_{min,s}$	[mm]	84	100	100	136	170	198	224
Min. spacing	$s_{min,s}$	[mm]	45	50	55	75	90	140	180
Min. edge distance	$c_{min,s}$	[mm]	50	40	50	65	80	100	200
REDUCED EMBEDMENT DEPTH									
Min. hole depth in substrate	$h_{0,r}$	[mm]	35	40	49	60	80	100	125
Installation depth	$h_{nom,r}$	[mm]	30	40	49	60	80	100	120
Min. substrate thickness	$h_{min,r}$	[mm]	80	100	100	100	130	158	194
Min. spacing	$s_{min,r}$	[mm]	40	45	55	100	100	125	160
Min. edge distance	$c_{min,r}$	[mm]	45	40	65	100	100	125	160

Mechanical properties

Size			M6	M8	M10	M12	M16	M20	M24
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	400	400	400	400	400	480	480
Nominal yield strength - tension	f_{yk}	[N/mm ²]	320	320	320	320	320	384	384
Cross sectional area - tension	A_s	[mm ²]	20.1	36.6	58	84.3	157	245	353
Elastic section modulus	W_{el}	[mm ³]	21.2	50.3	98.2	169.6	402.1	785.4	1357.2
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	10.9	25.9	50.7	87.5	207.5	452.4	781.7
Design bending resistance	M	[Nm]	8.7	20.7	40.5	70	166	361.9	625.4

Basic performance data

Performance data for single anchor without influence of edge distance and spacing

Size		M6	M8	M10	M12	M16	M20	M24
MEAN ULTIMATE LOAD								
TENSION LOAD $N_{Ru,m}$								
Standard embedment depth	[kN]	8.70	18.10	19.80	28.00	49.70	65.30	67.60
Reduced embedment depth	[kN]	5.70	10.90	11.40	21.50	43.00	45.50	62.70
SHEAR LOAD $V_{Ru,m}$								
Standard embedment depth	[kN]	6.00	12.20	19.20	28.00	51.50	80.90	118.60
Reduced embedment depth	[kN]	6.00	12.20	19.10	28.00	51.50	94.70	118.60
CHARACTERISTIC LOAD								
TENSION LOAD N_{Rk}								
Standard embedment depth	[kN]	6.80	12.00	12.00	25.00	40.00	40.00	50.00
Reduced embedment depth	[kN]	4.50	9.00	9.00	16.00	30.00	35.00	48.90
SHEAR LOAD V_{Rk}								
Standard embedment depth	[kN]	5.50	10.10	16.00	23.30	43.00	67.40	91.10
Reduced embedment depth	[kN]	5.50	10.10	12.00	23.30	43.00	67.40	97.10
DESIGN LOAD								
TENSION LOAD N_{Rd}								
Standard embedment depth	[kN]	3.80	6.70	6.70	13.90	22.20	22.20	27.80
Reduced embedment depth	[kN]	2.50	5.00	5.00	8.90	16.70	19.40	27.20
SHEAR LOAD V_{Rd}								
Standard embedment depth	[kN]	4.40	8.10	12.80	18.60	34.40	53.90	77.70
Reduced embedment depth	[kN]	4.40	8.10	6.70	18.60	34.40	38.20	77.70
RECOMMENDED LOAD								
TENSION LOAD N_{rec}								
Standard embedment depth	[kN]	2.70	4.80	4.80	9.90	15.90	15.90	19.80
Reduced embedment depth	[kN]	1.80	3.60	3.60	6.40	11.90	13.90	19.40
SHEAR LOAD V_{rec}								
Standard embedment depth	[kN]	3.10	5.80	9.10	13.30	24.60	38.50	55.50
Reduced embedment depth	[kN]	3.10	5.80	4.80	13.30	24.60	27.30	55.50

Design performance data

Standard embedment depth

Size			M6	M8	M10	M12	M16	M20	M24
Effective embedment depth	h_{ef}	[mm]	42.00	47.00	49.00	68.00	85.00	99.00	112.00
TENSION LOAD									
STEEL FAILURE									
Characteristic resistance	$N_{Rk,s}$	[kN]	8.10	15.80	25.20	37.30	66.10	101.00	137.20
Design resistance $V_{Ms} = 1.4$	$N_{Rd,s}$	[kN]	5.79	11.29	18.00	26.64	47.21	72.14	98.00
PULL-OUT FAILURE; NON-CRACKED CONCRETE C20/25									
Characteristic resistance	$N_{Rk,p}$	[kN]	6.80	12.00	12.00	25.00	40.00	40.00	50.00
Design resistance $V_{Mp} = 1.8$	$N_{Rd,p}$	[kN]	3.78	6.67	6.67	13.89	22.22	22.22	27.78
Increasing factors for $N_{Rd,p}$ - C30/37	Ψ_c	-	1.10	1.10	1.37	1.16	1.17	1.30	1.10
Increasing factors for $N_{Rd,p}$ - C40/50	Ψ_c	-	1.21	1.21	1.74	1.33	1.34	1.59	1.21
Increasing factors for $N_{Rd,p}$ - C50/60	Ψ_c	-	1.32	1.32	2.10	1.49	1.50	1.89	1.32
Spacing	$s_{cr,N}$	[mm]	126.00	141.00	147.00	204.00	255.00	297.00	336.00
Edge distance	$c_{cr,N}$	[mm]	63.00	71.00	74.00	102.00	128.00	149.00	168.00
SHEAR LOAD									
CONCRETE EDGE FAILURE; NON-CRACKED CONCRETE C20/25									
Edge distance	c_1	[mm]	50.00	55.00	65.00	90.00	105.00	160.00	200.00
Characteristic resistance for c_1	$V_{Rk,c}$	[kN]	6.39	7.71	10.04	16.86	22.48	41.63	58.63
Design resistance $V_{Mc} = 1.8$	$V_{Rd,c}$	[kN]	3.55	4.28	5.58	9.37	12.49	23.13	32.57
STEEL FAILURE									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	5.50	10.10	16.00	23.30	43.00	67.40	94.10
Design resistance $V_{Ms} = 1.25$	$V_{Rd,s}$	[kN]	4.40	8.08	12.80	18.64	34.40	53.92	77.68

Reduced embedment depth

Size			M6	M8	M10	M12	M16	M20	M24
Effective embedment depth	h_{ef}	[mm]	22.00	32.00	39.00	48.00	65.00	79.00	97.00
TENSION LOAD									
STEEL FAILURE									
Characteristic resistance	$N_{Rk,s}$	[kN]	8.10	15.80	25.20	37.30	66.10	101.00	137.20
Design resistance $V_{Ms} = 1.4$	$N_{Rd,s}$	[kN]	5.79	11.29	18.00	26.64	47.21	72.14	98.00
PULL-OUT FAILURE; NON-CRACKED CONCRETE C20/25									
Characteristic resistance	$N_{Rk,p}$	[kN]	4.50	9.00	9.00	16.00	30.00	35.00	48.90
Design resistance $V_{Mp} = 1.8$	$N_{Rd,p}$	[kN]	2.50	5.00	5.00	8.89	16.67	19.44	27.17
Increasing factors for $N_{Rd,p}$ - C30/37	Ψ_c	-	1.25	1.25	1.36	1.20	1.12	1.18	1.25
Increasing factors for $N_{Rd,p}$ - C40/50	Ψ_c	-	1.50	1.50	1.72	1.40	1.23	1.36	1.50
Increasing factors for $N_{Rd,p}$ - C50/60	Ψ_c	-	1.76	1.76	2.08	1.60	1.34	1.54	1.76
Spacing	$s_{cr,N}$	[mm]	66.00	96.00	117.00	144.00	195.00	237.00	291.00
Edge distance	$c_{cr,N}$	[mm]	33.00	48.00	59.00	72.00	98.00	119.00	146.00
SHEAR LOAD									
CONCRETE EDGE FAILURE; NON-CRACKED CONCRETE C20/25									
Edge distance	c_1	[mm]	45.00	50.00	65.00	100.00	100.00	125.00	160.00
Characteristic resistance for c_1	$V_{Rk,c}$	[kN]	5.05	6.37	9.67	18.36	20.04	28.81	42.54
Design resistance $V_{Mc} = 1.8$	$V_{Rd,c}$	[kN]	2.80	3.54	5.37	10.20	11.13	16.00	23.63
CONCRETE PRY-OUT FAILURE; NON-CRACKED CONCRETE C20/25									
Factor	k	-	-	-	1.00	-	-	2.00	-
Characteristic resistance	$V_{Rk,cp}$	[kN]	-	-	12.00	-	-	68.70	-
Design resistance $V_{Mc} = 1.8$	$V_{Rd,cp}$	[kN]	-	-	6.67	-	-	38.17	-
STEEL FAILURE									
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	5.50	10.10	16.00	23.30	43.00	67.40	97.10
Design resistance $V_{Ms} = 1.25$	$V_{Rd,s}$	[kN]	4.40	8.08	12.80	18.64	34.40	53.92	77.68

Product commercial data

Size	Product Code	Anchor		Quantity [pcs]			Weight [kg]			Bar Codes
		Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
M6	R-XPT-06050/10	6	50	100	100	16000	1.27	1.27	233.2	5906675233499
	R-XPT-06065/5	6	65	100	100	16000	1.55	1.55	278.0	5906675233505
	R-XPT-06085/25	6	85	100	100	16000	1.85	1.85	326.0	5906675233512
	R-XPT-06100/40	6	100	100	100	16000	2.1	2.1	370.8	5906675250311
M8	R-XPT-08050/5 ¹⁾	8	50	100	100	16000	2.3	2.3	396.4	5906675250328
	R-XPT-08060/10 ¹⁾	8	60	100	100	16000	2.6	2.6	446.0	5906675234601
	R-XPT-08065/15 ¹⁾	8	65	100	100	16000	2.7	2.7	465.2	5906675250335
	R-XPT-08075/10 ¹⁾	8	75	100	100	16000	3.1	3.1	518.0	5906675233536
	R-XPT-08080/15 ¹⁾	8	80	100	100	16000	3.2	3.2	542.0	5906675250342
	R-XPT-08085/20 ¹⁾	8	85	100	100	16000	3.4	3.4	578.8	5906675249636
	R-XPT-08095/30 ¹⁾	8	95	100	100	12000	3.7	3.7	469.2	5906675233543
	R-XPT-08115/50 ¹⁾	8	115	100	100	16000	4.3	4.3	710.0	5906675233550
	R-XPT-08140/75 ¹⁾	8	140	100	100	16000	5.2	5.2	855.6	5906675233567
	R-XPT-08150/85 ¹⁾	8	150	100	100	16000	5.4	5.4	887.6	5906675250359
	R-XPT-10065/5 ¹⁾	10	65	50	50	8000	2.4	2.4	408.4	5906675233574
	R-XPT-10080/10 ¹⁾	10	80	50	50	8000	2.7	2.7	468.4	5906675233581
M10	R-XPT-10085/15 ¹⁾	10	85							
	R-XPT-10095/25 ¹⁾	10	95	50	50	8000	3.1	3.1	527.6	5906675233598
	R-XPT-10115/45 ¹⁾	10	115	50	50	6000	3.6	3.6	463.2	5906675233604
	R-XPT-10130/60 ¹⁾	10	130	50	50	6000	4.0	4.0	505.8	5906675249643
	R-XPT-10140/70 ¹⁾	10	140	50	50	8000	4.2	4.2	705.2	5906675233611
	R-XPT-10150/80 ¹⁾	10	150	50	50	8000	4.5	4.5	742.0	5906675249650
	R-XPT-10180/110 ¹⁾	10	180	50	50	6000	5.2	5.2	654.6	5906675250366
	R-XPT-12080/5 ¹⁾	12	80	50	50	8000	4.1	4.1	678.0	5906675233628
M12	R-XPT-12100/5 ¹⁾	12	100	50	50	8000	4.8	4.8	792.4	5906675233635
	R-XPT-12120/25 ¹⁾	12	120	50	50	6000	5.5	5.5	690.0	5906675250373
	R-XPT-12125/30 ¹⁾	12	125	50	50	6000	5.7	5.7	709.2	5906675233642
	R-XPT-12135/40 ¹⁾	12	135	50	50	6000	6.1	6.1	757.8	5906675250380
	R-XPT-12140/45 ¹⁾	12	140	50	50	6000	6.2	6.2	769.2	5906675249667
	R-XPT-12150/55 ¹⁾	12	150	50	50	4000	6.6	6.6	558.4	5906675233659
	R-XPT-12180/85 ¹⁾	12	180	50	50	4000	7.6	7.6	639.2	5906675233666
	R-XPT-12220/125 ¹⁾	12	220	50	50	4000	9.1	9.1	755.2	5906675233673
	R-XPT-12300/205 ¹⁾	12	300	10	60	800	2.5	15.2	232.1	5906675251424
	R-XPT-16100/5 ¹⁾	16	100	25	25	4000	4.4	4.4	731.6	5906675233680
M16	R-XPT-16105/10 ¹⁾	16	105	25	25	4000	4.6	4.6	763.6	5906675250403
	R-XPT-16125/5 ¹⁾	16	125	25	25	4000	5.3	5.3	869.6	5906675233697
	R-XPT-16140/20 ¹⁾	16	140	25	25	4000	5.7	5.7	948.4	5906675249063
	R-XPT-16150/30 ¹⁾	16	150	25	25	4000	6.1	6.1	1001.2	5906675249674
	R-XPT-16160/40 ¹⁾	16	160	25	25	3000	6.4	6.4	792.9	5906675250410
	R-XPT-16180/60 ¹⁾	16	180	25	25	3000	7.0	7.0	873.3	5906675249681
	R-XPT-16220/100 ¹⁾	16	220	25	25	3000	8.4	8.4	1037.4	5906675233727
	R-XPT-16280/160 ¹⁾	16	280	15	15	1800	6.3	6.3	783.5	5906675250427
M20	R-XPT-20125/5 ¹⁾	20	125	25	25	3000	8.3	8.3	1020.0	5906675233734
	R-XPT-20160/20 ¹⁾	20	160	25	25	3000	10.1	10.1	1239.0	5906675233741
	R-XPT-20200/60 ¹⁾	20	200	10	10	1200	4.9	4.9	619.7	5906675233758
	R-XPT-20300/160 ¹⁾	20	300	10	10	1200	7.1	7.1	875.5	5906675233765
M24	R-XPT-24180/20	24	180	10	10	1200	7.0	7.0	872.2	5906675233772
	R-XPT-24260/100	24	260	10	10	1200	9.3	9.3	1148.8	5906675233789
	R-XPT-24300/140	24	300	10	10	800	10.5	10.5	872.7	5906675233796

1) ETA 17/0183