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European Technical Assessment

ETA 21/0062 of 24/11/2021

Technical Assessment Body issuing the ETA: Technical and Test Institute for Construction Prague	
Trade name of the construction product	R-XPTIII-HD
Product family to which the construction product belongs	Product area code: 33 Torque controlled expansion anchor for use in uncracked concrete
Manufacturer	Rawlplug S.A. Ul. Kwidzyńska 6 51-416 Wrocław Poland
Manufacturing plant	Manufacturing Plant No 2
This European Technical Assessment contains	10 pages including 8 Annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	EAD 330232-01-0601 Mechanical fasteners for use in concrete
This version replaces	ETA 21/0062 issued on 09/08/2021

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

1. Technical description of the product

The R-XPTIII-HD are through-fixing torque-controlled expansion anchors in sizes of M8, M10, M12 and M16. Each type comprises a nut, bolt, washer and expansion sleeve. The anchors are made from hot dip galvanized carbon steel.

The anchor is installed in a drilled hole; tightening the nut draws the cone into the sleeve. The expansion of this sleeve applies the anchorage.

The installed anchor is shown in Annex 1.

2. Specification of the intended use in accordance with the applicable EAD

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The provisions made in this European Technical Assessment are based on an assumed working life of the anchor of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the products in relation to the expected economically reasonable working life of the works.

3. Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance (static and quasi-static loading)	See Annex C 1 and C 2
Displacement	See Annex C 1 and C 2

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1 according to EN 13501-1
Resistance to fire	No performance assessed

4. Assessment and verification of constancy of performance (AVCP) system applied with reference to its legal base

According to the Decision 97/463/EC of the European Commission[1], the system 1 of assessment verification of constancy of performance (see Annex V to the Regulation (EU) No 305/2011) apply.

5. Technical details necessary for the implementation of the AVCP system, as provided in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Technical and Test Institute for Construction Prague.

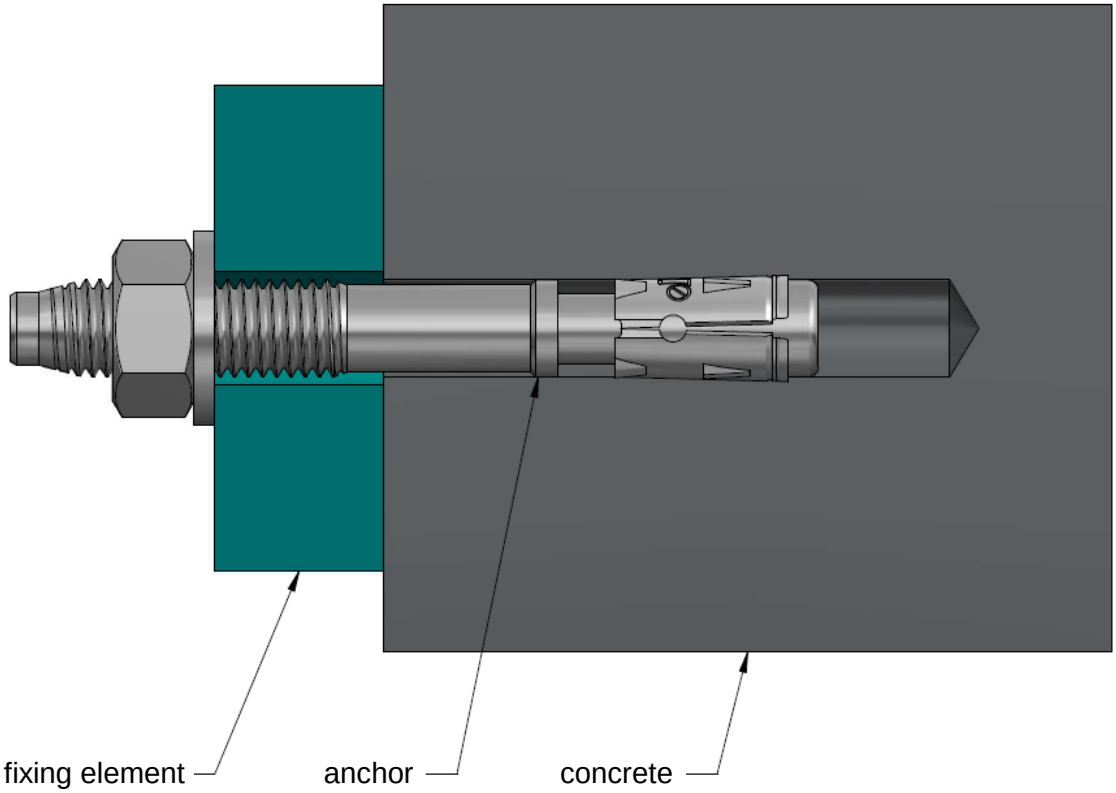
Issued in Prague on 24.11.2021

By

Ing. Mária Schaan
Head of the Technical Assessment Body

[1] Official Journal of the European Communities L 198/31 25.7.1997

R-XPTIII-HD - Installed anchor



R-XPTIII-HD	**Annex A 1**
Product description Installed conditions	

R-XPTIII-HD – components

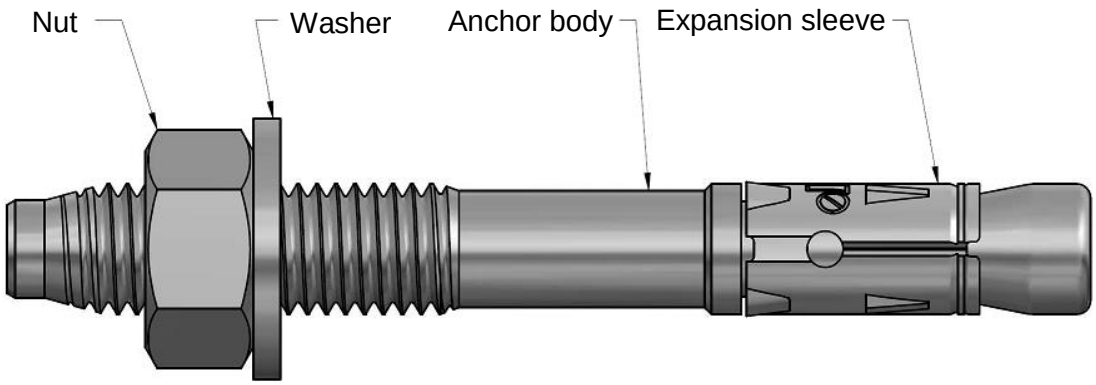


Table A1 - Materials

Component	Material	Coating
Anchor body	Carbon steel, ISO 898-1 Rupture elongation A_5 > 8%	Hot dip galvanized, ISO 10684
Expansion sleeve	Stainless steel grade 1.4401 or 1.4404 EN 10088-2	
Hexagonal nut	according DIN 934	Hot dip galvanized, ISO 10684
Washer	according DIN 125A or DIN 9021	Hot dip galvanized, ISO 1461

R-XPTIII-HD	**Annex A 2**
Product description Materials	

Table A2 – Marking

Bolt length	Marking	Sizes			
		M8	M10	M12	M16
		t_{fix} [mm]			
65	**b**	1			
70	**#**	5	1		
75	**c**	10	5		
80	**D**	15	10		
85	**d**	20	15		
90	**E**	25	20		
95	**e**	30	25	1	
100	**F**	35	30	5	
105	**f**	40	35	10	
110	**G**	45	40	15	
115	**g**	50	45	20	
120	**H**	55	50	25	1
125	**h**	60	55	30	5
130	**J**	65	60	35	10
135	**I**	70	65	40	15
140	**K**	75	70	45	20
145	**k**	80	75	50	25
150	**L**	85	80	55	30
155	**2**	90	85	60	35
160	**M**	95	90	65	40
165	**m**	100	95	70	45
170	**N**	105	100	75	50
175	**n**	110	105	80	55
180	**P**	115	110	85	60
185	**o**	120	115	90	65
190	**W**		120	95	70
195	**z**		125	100	75
200	**R**		130	105	80
205	**r**			110	85
210	**3**			115	90
215	**4**			120	95
220	**S**			125	100
225	**6**			130	105
230	**7**			135	110
235	**8**			140	115
240	**T**			145	120
245	**t**			150	125
250	**U**			155	130
255	**aa**			160	135
260	**V**			165	140
265	**bb**			170	145
270	**CC**			175	150
275	**dd**			180	155
280	**X**			185	160
285	**ee**			190	165
290	**FF**			195	170
295	**ff**			200	175
300	**Y**			205	180

R-XPTIII-HD

Product description
Marking

Annex A 3

Specifications of intended use

Anchorages subject to:

- Static and quasi-static load.

Base materials

- Uncracked concrete.
- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum and C50/60 at maximum according EN 206-1:2000-12.

Use conditions (Environmental conditions)

- Structures subject to dry internal conditions.

Design:

- The anchorages are designed in accordance with the EN 1992-4 under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings.

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Use of the anchor only as supplied by the manufacturer without exchanging any components of the anchor.
- Anchor installation in accordance with the manufacturer's specifications and drawings using the appropriate tools.
- Effective anchoring depth, edge distance and spacing not less than the specified values without minus tolerance.
- In case of aborted drill hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not in the direction of load application.

R-XPTIII-HD	**Annex B 1**
Intended use Specifications	

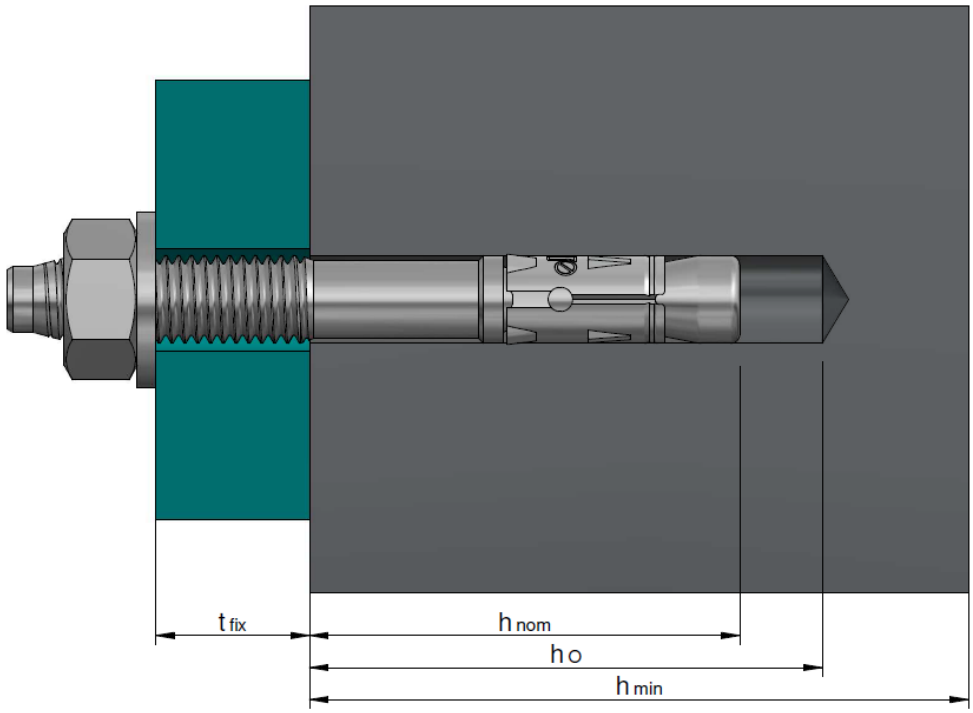
Table B1 - Installation parameters

Size	Drill hole diameter d_0 [mm]	Max. hole diameter in fixture d_f[1)] [mm]	Min. hole depth h_0 [mm]	Nominal embedment depth h_{nom} [mm]	Min. concrete thickness h_{min} [mm]	Installation torque T_{inst} [Nm]
M8	8	9	65	55	100	15
M10	10	12	70	60	100	30
M12	12	14	90	80	140	50
M16	16	18	110	100	170	100

[1)] For the design of bigger clearance holes in the fixture see EN 1992-4:2018

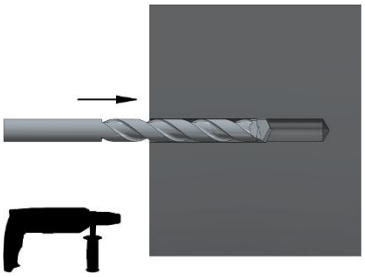
Table B2 - Installation parameters – Minimum spacing and edge distance

Size			M8	M10	M12	M16
Minimum thickness of concrete member	h_{min}	[mm]	100	100	140	170
Minimum spacing	s_{min}	[mm]	50	70	75	95
for edge distance	c ≥	[mm]	55	80	90	150
Minimum edge distance	c_{min}	[mm]	40	60	65	85
for spacing	s ≥	[mm]	100	100	100	160

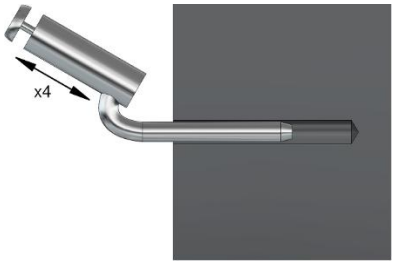


R-XPTIII-HD	**Annex B 2**
Intended use Installation parameters	

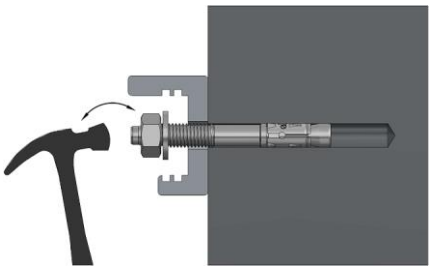
Installation instructions

1. 

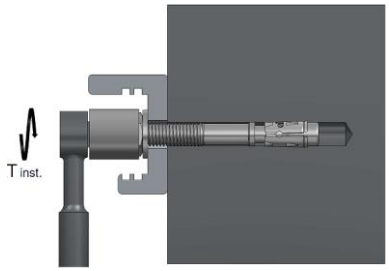
Drill a hole of required diameter and depth

2. 

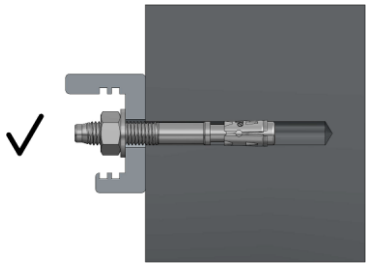
Clear the hole of drilling dust and debris
(using blowpump or equivalent method)

3. 

Lightly tap the throughbolt through the fixture into hole with a hammer, until fixing depth is reached

4. 

Tighten to the required installation torque

5. 

Assembled condition of anchor

R-XPTIII-HD	**Annex B 3**
Intended use Installation instructions	

Table C1 – Characteristic resistance under tension load

Size				M8	M10	M12	M16
Steel failure							
Characteristic resistance		$N_{Rk,s}$	[kN]	17,5	27,6	40,0	71,0
Partial safety factor		γ_{Ms}	[-]	1,5			
Pull-out failure							
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p}$	[kN]	13	15	25	34
Installation safety factor		γ_{inst}	[-]	1,0	1,0	1,0	1,0
Increasing factor							
Uncracked concrete	C30/37	ψ_c	[-]	1,12	1,08	1,17	1,22
	C40/50			1,23	1,15	1,32	1,41
	C50/60			1,30	1,19	1,42	1,55
Concrete cone and splitting failure							
Effective embedment depth		h_{ef}	[mm]	47	50	68	85
Factor for concrete cone failure for uncracked concrete		$k_{ucr,N}$	[-]	11,0			
Installation safety factor		γ_{inst}	[-]	1,0			
Spacing	concrete cone failure	$s_{cr,N}$	[mm]	$3 \cdot h_{ef}$			
	splitting failure	$s_{cr,sp}$	[mm]	240	260	340	430
Edge distance	concrete cone failure	$c_{cr,N}$	[mm]	$1,5 \cdot h_{ef}$			
	splitting failure	$c_{cr,sp}$	[mm]	120	130	170	215

Table C2 – Displacement under tension load

Size			M8	M10	M12	M16
Tension load in uncracked concrete	N	[kN]	5,7	7,1	11,4	16,2
Displacement	δ_{N0}	[mm]	0,3	0,3	0,4	0,2
	$\delta_{N\infty}$	[mm]	0,6	0,6	0,6	0,6

R-XPTIII-HD

Performances
Characteristic resistance under tension load
Displacement under tension load

Annex C 1

Table C3 – Characteristic resistance under shear load

Steel failure without lever arm						
Size			M8	M10	M12	M16
Characteristic resistance	$V^0_{Rk,s}$	[kN]	11,0	17,4	25,3	47,1
Ductility factor	k_7	[-]	1,0	1,0	1,0	1,0
Partial safety factor	γ_{Ms}	[-]	1,25	1,25	1,25	1,25

Steel failure with lever arm						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	22	45	79	200
Partial safety factor	γ_{Ms}	[-]	1,25	1,25	1,25	1,25

Concrete pry-out failure						
Factor	k_8	[-]	1,0	1,0	2,0	2,0
Installation safety factor	γ_{inst}	[-]	1,0	1,0	1,0	1,0

Concrete edge failure						
Effective length of anchor	ℓ_f	[mm]	47	50	68	85
Anchor diameter	d_{nom}	[mm]	8	10	12	16
Installation safety factor	γ_{inst}	[-]	1,0	1,0	1,0	1,0

Table C4 – Displacement under shear load

Size			M8	M10	M12	M16
Shear load in uncracked concrete	V	[kN]	6,3	9,9	14,5	26,9
Displacement	δ_{V0}	[mm]	1,2	1,3	1,6	1,9
	$\delta_{V\infty}$	[mm]	1,8	2,0	2,4	2,9

R-XPTIII-HD

Performances
Characteristic resistance under shear load
Displacement under shear load

Annex C 2