

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-16/0708
of 28 July 2020

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

RAPTOR Nail Anchor

Product family
to which the construction product belongs

Fasteners for use in concrete for redundant
non-structural systems

Manufacturer

STARK Deutschland GmbH
Hafeninsel 9
63067 Offenbach
DEUTSCHLAND

Manufacturing plant

Herstellerwerk STARK 1

This European Technical Assessment
contains

8 pages including 3 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 330747-00-0601, Edition 06/2018

This version replaces

ETA-16/0708 issued on 26 August 2016

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Specific Part

1 Technical description of the product

The RAPTOR Nail Anchor is an anchor made of zinc-plated steel which is placed into a drilled hole and anchored by deformation-controlled expansion.
The product description is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document

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 verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 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 right 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 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C 1

3.2 Safety in use (BWR 4)

Essential characteristic	Performance
Characteristic resistance for all load directions and modes of failure for simplified design	See Annex C 1
Durability	See Annex B 1

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

In accordance with European Assessment Document EAD No. 330747-00-0601, the applicable European legal act is: [97/161/EC].
The system to be applied is: 2+

English translation prepared by DIBt

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

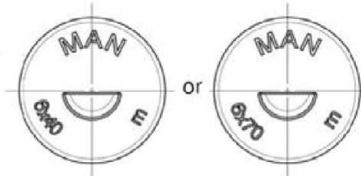
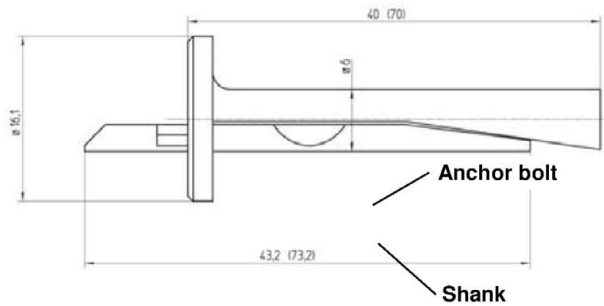
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 28 July 2020 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Baderschneider

Head marking: Identifying mark of the producer and anchor type



Installed condition for RAPTOR Nail Anchor

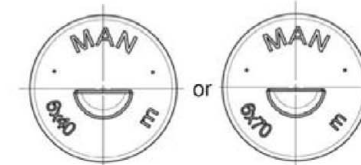
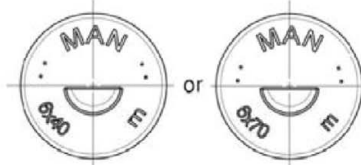
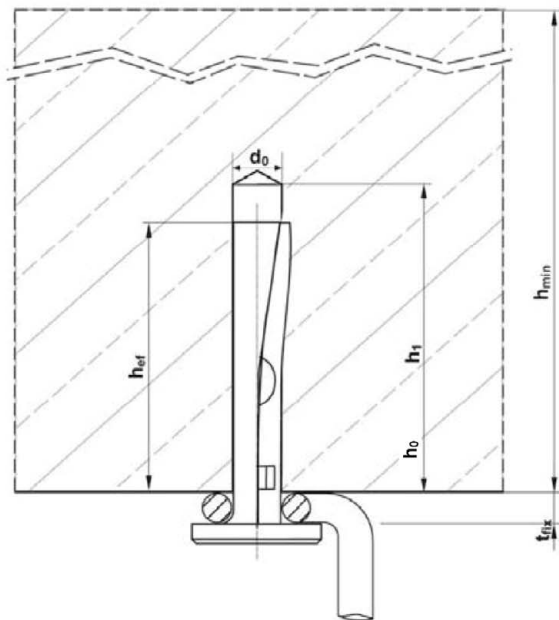


Table A1: Anchor dimension, marking and material

RAPTOR Nail Anchor		6 x 40	6 x 70
Marking / embossing		MAN 6 x 40	MAN 6 x 70
Anchor length	[mm]	40	70
Material	Anchor bolt	Strength class 4.8 according to EN ISO 898-1:2013 galvanized steel, Zinc plating $\geq 5 \mu\text{m}$ according to EN ISO 4042:2018	
	Shank	Strength class 8.8 according to EN ISO 898-1:2013; galvanized steel, Zinc plating $\geq 5 \mu\text{m}$ according to EN ISO 4042:2018	

RAPTOR Nail Anchor

Product description

Installed condition, anchor types, dimensions and materials

Annex A1

Specifications of intended use

Anchorage subject to:

- Static and quasi-static loads
- Used only for multiple use for non-structural application.
- Fire exposure

Base materials:

- Compacted reinforced or unreinforced normal weight concrete without fibres according to EN 206:2013,
- Strength classes C20/25 to C50/60 according to EN 206:2013,
- Non-cracked and cracked concrete

Use conditions:

- Structures subject to dry internal conditions

Design:

- The anchorages are to be designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings shall be prepared taking account of the loads to be anchored, the nature and strength of the base materials and the dimensions of the anchorage members as well as of the relevant tolerances. The position of the anchor shall be indicated on the design drawings (e. g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages are designed in accordance with EN 1992-4:2018 Design method C and EOTA Technical Report TR 055, Edition February 2018

Installation:

- Dry or wet concrete
- Anchor installation has to be carried out by appropriately qualified personnel according to Annex B2 under the supervision of the person responsible for technical matters of the site.
- Hole drilling by hammer drilling
- Anchor expansion by impact on the shank. The anchor is properly set, if no further driving by impact is possible and the excess of the shank is at maximum 2,5 mm.
- The anchor may only be set once.

RAPTOR Nail Anchor

Intended use
Specifications

Annex B1

Table B1: Installation parameters

RAPTOR Nail Anchor			6 x 40	6 x 70
Effective anchorage depth	$h_{ef} \geq$	[mm]	32	
Thickness of fixture	t_{fix}	[mm]	0 - 5	0 - 35
Nominal drill hole diameter	d_o	[mm]	6	
Max. drill bit diameter	d_{cut}	[mm]	6,4	
Drill hole depth	$h_o \geq$	[mm]	40	
Minimum thickness of concrete member	h_{min}	[mm]	80	
Minimum spacing	s_{min}	[mm]	200	
Minimum edge distance	c_{min}	[mm]	150	

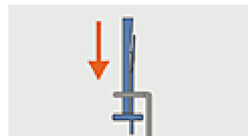
Installation instructions:



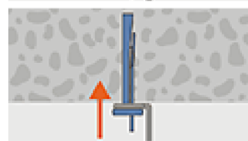
Make the drill hole



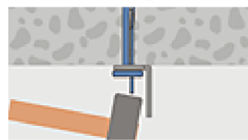
Clean the drill hole from drill dust



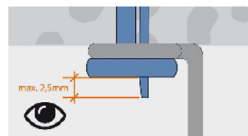
Place the fixture on the ceiling anchor



Place the ceiling anchor with the fixture concisely into the hole



Drive in the nail with a hammer



Installed ceiling anchor; control of maximum overlap of shank:
 $\leq 2,5 \text{ mm}$

RAPTOR Nail Anchor

Intended use

Installation parameters, edge distance and spacing
Installation instructions

Annex B2

Table C1: Characteristic values for multiple use for non-structural applications, Design method C

RAPTOR Nail Anchor			6 x 40	6 x 70
Installation factor	γ_{inst}	[-]	1,0	
Minimum spacing	S_{cr}	[mm]	200	
Minimum edge distance	C_{cr}	[mm]	150	
Characteristic resistance for all load directions				
Characteristic resistance	F^0_{Rk}	[kN]	3,0	
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	5,4	

Table C2: Characteristic values under fire exposure in cracked and non-cracked concrete C20/25 to C50/60 in all load directions without lever arm, Design method C

Fire resistance class	RAPTOR Nail Anchor			6 x 40	6 x 70
R 30	Characteristic resistance	$F^0_{Rk,fi}$ ¹⁾	[kN]	0,6	
R 60				0,5	
R 90				0,4	
R 120				0,3	
R 30 - R 120	Minimum spacing	$S_{cr,fi}$	[mm]	200	
	Minimum edge distance ²⁾	$C_{cr,fi}$	[mm]	150	

¹⁾ In absence of other national regulations, the partial safety factor for resistance under fire exposure $\gamma_{m,fi} = 1,0$ is recommended.

²⁾ In case of fire attack from more than one side of the concrete member, the edge distance shall be ≥ 300 mm.

RAPTOR Nail Anchor

Performances
Characteristic values

Annex C3