Deutsches Institut für Bautechnik

Public-law institution jointly founded by the federal states and the Federation

European Technical Assessment Body for construction products

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European Technical Assessment ETA-09/0175 of 5 May 2025

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	Vorpa Heavy-duty anchor TOP
Product family to which the construction product belongs	Torque controlled expansion anchor for use in non-cracked concrete
Manufacturer	VORPA srl Via S. Leo 5 47838 Riccione (RN) ITALIEN
Manufacturing plant	VORPA srl, ITALY
This European Technical Assessment contains	12 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 330232-01-0601, Edition 05/2021
This version replaces	ETA-09/0175 issued on 22 August 2014

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Specific Part

1 Technical description of the product

The Vorpa heavy-duty anchor TOP (type TOP/TOP A4, type TOP BU/TOP BU A4 and type TOP BP) in the range of M6, M8, M10 and M12 is an anchor made of galvanised steel or stainless steel which is placed into a drilled hole and anchored by torque-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 fastener 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 fastener 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 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance to tension load (static and quasi-static loading)	See Annex C 1
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C 2
Characteristic resistance for seismic performance category C1 and C2	No performance assessed
Displacements	See Annex C 1 and C 2

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	No performance assessed

3.3 Aspects of durability

Essential characteristic	Performance
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 the European Assessment Document EAD 330232-01-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

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 5 May 2025 by Deutsches Institut für Bautechnik

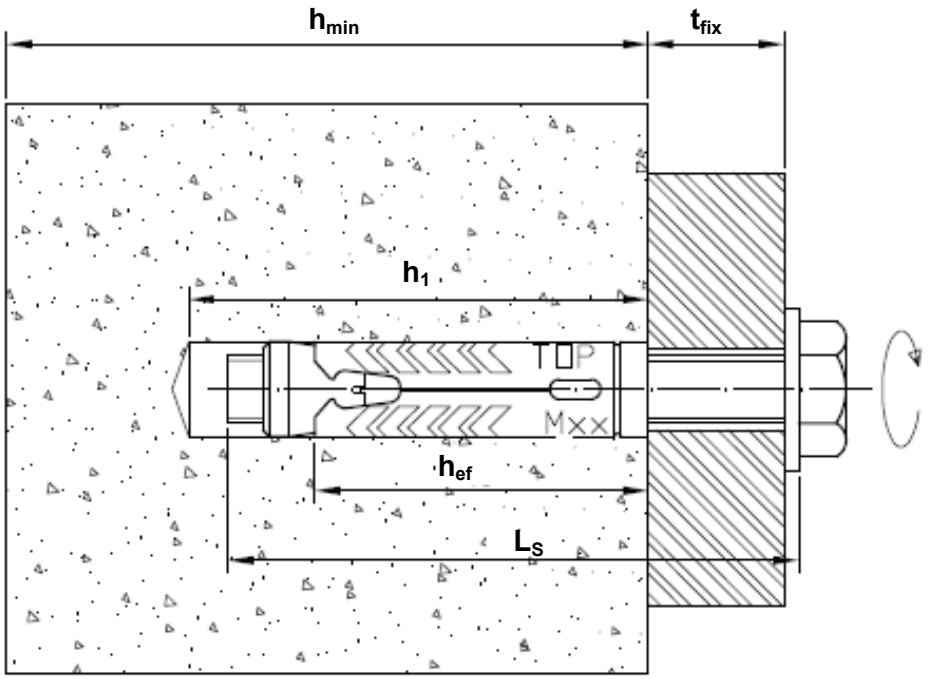
Dipl.-Ing. Beatrix Wittstock
Head of Section

beglaubigt:
Ziegler

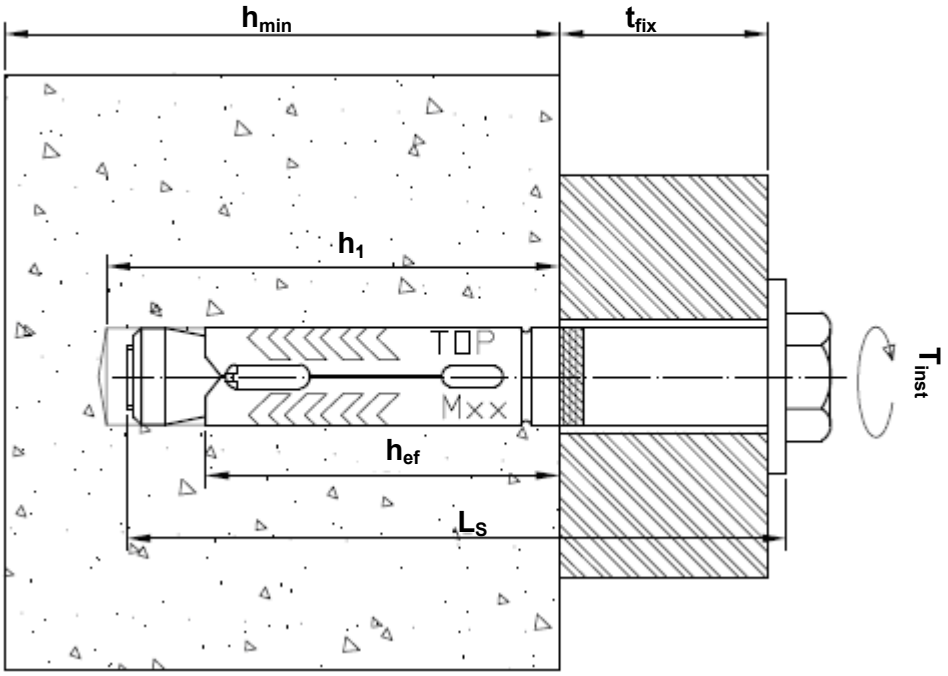
Deutsches Institut für Bautechnik DIBt

Installed conditions

Pre-setting Installation Type TOP (A4) and Type TOP BU (A4):



Through-setting installation Type TOP BP:



Vorpa Heavy-duty anchor TOP	**Annex A 1**
Product description Installed condition	

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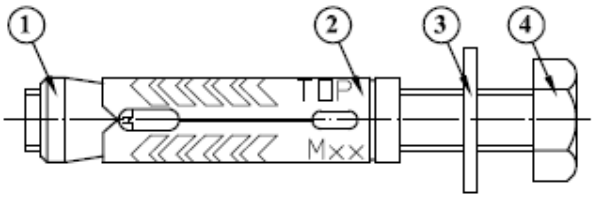
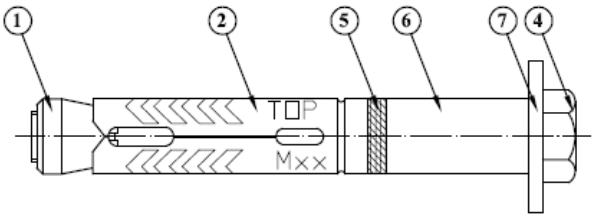
Type TOP (A4) [1] and Type TOP BU (A4) [2]



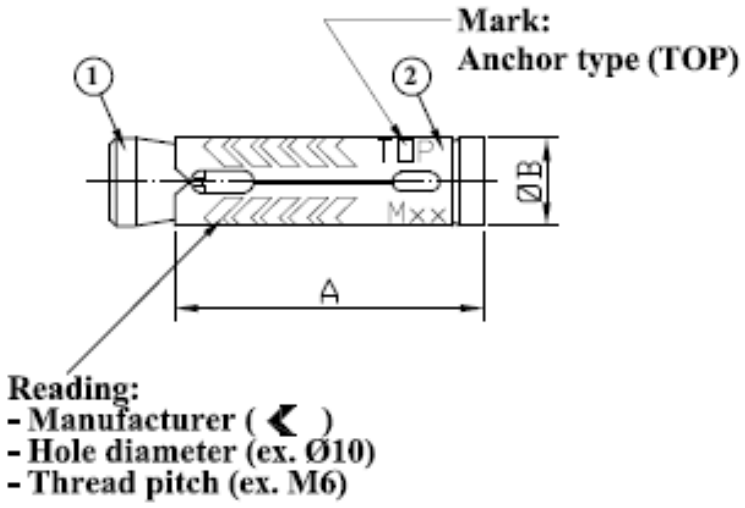
① Conical nut
② Expander
③ Washer
④ Hexagonal head bolt

Type TOP BP



① Conical nut
② Expander
④ Hexagonal head bolt
⑤ Spacer ring
⑥ Distance sleeve
⑦ Washer

[1] The hexagon head bolt and the washer according to Table A1 and B1 must be purchased by the user.
[2] The hexagon head bolt and the washer is provided by the manufacturer together with the anchor.



Vorpa Heavy-duty anchor TOP	**Annex A 2**
Product description Marking and denomination	

Table A1: Materials

Comp.	Denomination	Type	Material
1	Conical nut	TOP TOP BU TOP BP	Steel, EN 10139:2016+A1:2020 Electrolytic zinc plated ≥ 5 µm according to EN ISO 4042:2022
		TOP A4 TOP BU A4	Stainless steel 1.4401, 1.4404 or 1.4571 according to EN 10088-1:2014
2	Expander	TOP TOP BU TOP BP	Cold formed steel, EN 10111:2008 Electrolytic zinc plated ≥ 5 µm according to EN ISO 4042:2022
		TOP A4 TOP BU A4	Stainless steel 1.4401, 1.4404 or 1.4571 according to EN 10088-1:2014
3 / 7	Washer	TOP TOP BU TOP BP	Steel min. 140 HV Electrolytic zinc plated ≥ 5 µm according to EN ISO 4042:2022
		TOP A4 TOP BU A4	Stainless steel 1.4401, 1.4404 or 1.4571 according to EN 10088-1:2014
4	Hexagonal head bolt	TOP TOP BU TOP BP	Steel, property class 8.8 EN ISO 898-1:2012 Electrolytic zinc plated ≥ 5 µm according to EN ISO 4042:2022
		TOP A4 TOP BU A4	Stainless steel 1.4401, 1.4404 or 1.4571 according to EN 10088-1:2014
5	Spacer ring	TOP BP	Polypropylene
6	Distance sleeve	TOP BP	Cold formed steel, EN 10111:2008 or Drawn pipe E235+C, EN 10305-2:2016 Electrolytic zinc plated ≥ 5 µm according to EN ISO 4042:2022

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Specifications of intended use

Anchorages subject to:

- Static and quasi-static loads.

Base materials:

- Compacted reinforced or unreinforced normal weight concrete without fibres according to EN 206:2013+A2:2021.
- Strength classes C20/25 to C50/60 according to EN 206:2013+A2:2021.
- Uncracked concrete.

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (all materials).
- For all other conditions according to EN 1993-1-4:2006 + A1:2015 corresponding to corrosion resistance class CRC III: TOP A4 and TOP BU A4 (stainless steel).

Design:

- Anchorages are designed 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 (e. g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages are designed in accordance with EN 1992-4:2018

Installation:

- Hole drilling by hammer drilling only.
- Clean the drill hole.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- in case of aborted 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.
- anchor installation such that the effective anchorage depth is complied with. This compliance is ensured, if the leading edge of expander does not more exceed the concrete surface

Vorpa Heavy-duty anchor TOP	**Annex B 1**
Intended Use Specifications	

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Table B1: Installation Parameters

Anchor size				**M6**	**M8**	**M10**	**M12**
Effective anchorage depth		h_{ef}	[mm]	39,5	44,5	51,5	63,0
Nominal drill hole diameter		d_0	[mm]	10	12	14	18
Cutting diameter of drill bit		$d_{cut} \leq$	[mm]	10,45	12,50	14,50	18,50
Drill hole depth		$h_1 \geq$	[mm]	$L_S - t_{fix} + 10$	$L_S - t_{fix} + 10$	$L_S - t_{fix} + 10$	$L_S - t_{fix} + 10$
Clearance hole diameter in the fixture	TOP (A4) TOP BU (A4)	$d_f \leq$	[mm]	7	9	12	14
	TOP BP	$d_f \leq$	[mm]	12	14	18	20
Torque moment		T_{inst}	[Nm]	10	25	40	75
Minimum fixture thickness	TOP (A4) TOP BU (A4) TOP BP	$t_{fix.min}$	[mm]	1	1	1	1
Maximum fixture thickness	TOP	$t_{fix.max}$	[mm]	150	200	250	300
	TOP A4	$t_{fix.max}$	[mm]	50	65	85	70
	TOP BU (A4)	$t_{fix,max}$	[mm]	10	14	20	25
	TOP BP	$t_{fix,max}$	[mm]	30	35	38	43
Hexagonal head bolt length	TOP (A4)	$L_S \geq$	[mm]	t_{fix}+45	t_{fix}+51	t_{fix}+60	t_{fix}+75
	TOP BU (A4)	L_S	[mm]	55	65	80	100
	TOP BP	L_S	[mm]	80	90	100	120

Table B2: Minimum thickness of concrete member, minimum spacing and edge distances

Anchor size			**M6**	**M8**	**M10**	**M12**
Minimum member thickness	h_{min}	[mm]	135	135	140	160
Minimum spacing	s_{min}	[mm]	65	90	135	165
Minimum edge distance	c_{min}	[mm]	45	70	85	115

Vorpa Heavy-duty anchor TOP

Intended Use
Installation parameters
Minimum thickness of concrete member, minimum spacing and edge distances

Annex B 2

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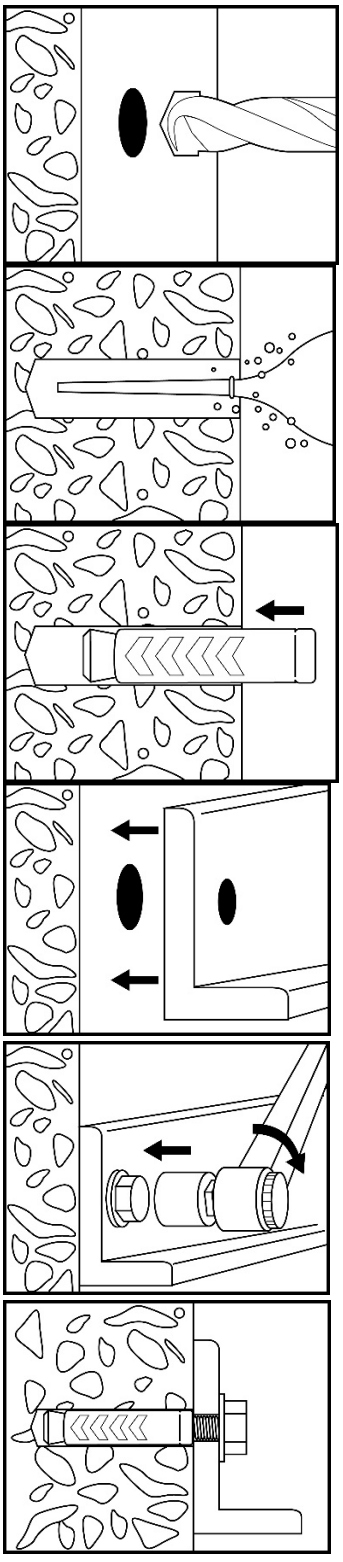
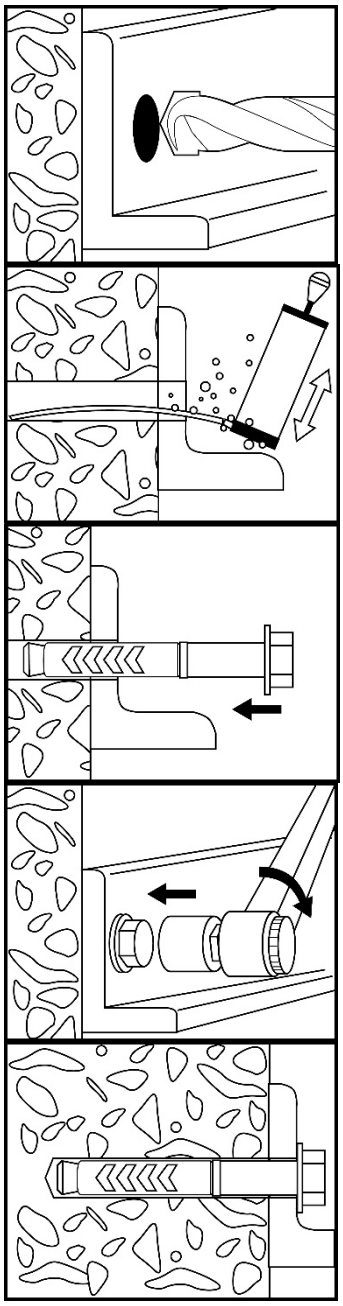
Pre-setting installation: TOP (A4) / TOP BU (A4)



Through-setting installation: TOP BP



Vorpa Heavy-duty anchor TOP

Intended Use
Installation instructions

Annex B 3

Table C1: Design method A, Characteristic values for tension loads

Anchor size				**M6**	**M8**	**M10**	**M12**
Steel failure							
Characteristic resistance, Anchor type TOP, TOP BU, TOP BP		$N_{Rk,s}$	[kN]	16,1	29,3	46,4	67,4
Partial safety factor		γ_{Ms} [1)]		1,5			
Characteristic resistance, Anchor type TOP A4, TOP BU A4		$N_{Rk,s}$	[kN]	14,1	25,6	40,6	59,0
Partial safety factor		γ_{Ms} [1)]		1,87			
Pullout failure							
Characteristic resistance in uncracked concrete C20/25, Anchor type TOP, TOP BU, TOP BP		$N_{Rk,p}$	[kN]	9	12	16	20
Characteristic resistance in uncracked concrete C20/25, Anchor type TOP A4, TOP BU A4		$N_{Rk,p}$	[kN]	7,5	9	12	16
Increasing factors for concrete	ψ_C	C30/37	[-]	1,17	1,08		1,22
		C40/50	[-]	1,33	1,15		1,41
		C50/60	[-]	1,50	1,23		1,55
Concrete cone failure							
Effective anchoring depth		h_{ef}	[mm]	39,5	44,5	51,5	63,0
Factor uncracked concrete		$k_{ucr,N}$	[-]	11,0			
Spacing		$s_{cr,N}$	[mm]	3 h_{ef}			
Edge distance		$c_{cr,N}$	[mm]	1,5 h_{ef}			
Splitting failure							
Characteristic resistance in uncracked concrete C20/25		$N^0_{Rk,sp}$	[kN]	Min ($N_{Rk,p}$; $N^0_{Rk,c}$ [2)])			
Spacing		$s_{cr,sp}$	[mm]	160	200	260	280
Edge distance		$c_{cr,sp}$	[mm]	80	100	130	140
Installation safety factor (TOP, TOP BU, TOP BP)		γ_{inst}	[-]	1,2	1,4	1,4	1,0
Installation safety factor (TOP A4, TOP BU A4)		γ_{inst}	[-]	1,0	1,2	1,2	1,2

[1)] In absence of other national regulations.
[2)] $N^0_{Rk,c}$ according to EN 1992-4:2018

Table C2: Displacements under tension loads

Anchor size			**M6**	**M8**	**M10**	**M12**
Tension load	N	[kN]	3,6	4,1	5,4	9,5
Displacement	δ_{N0}	[mm]	0,4	0,3	0,3	0,3
	$\delta_{N\infty}$	[mm]	1,2			

Vorpa Heavy-duty anchor TOP

Annex C 1

Performances
Design method A, Characteristic values of resistance under tension loads
Displacements under tension loads

Table C3: Design method A, Characteristic values for shear loads

Anchor size			**M6**	**M8**	**M10**	**M12**
Steel failure without level arm						
Characteristic resistance, Anchor type TOP, TOP BU, TOP BP	$V^0_{Rk,s}$	[kN]	8,0	14,6	23,2	33,7
Partial safety factor	γ_{Ms} 1)	[-]	1,25			
Characteristic resistance, Anchor type TOP A4, TOP BU A4	$V^0_{Rk,s}$	[kN]	7,0	12,8	20,3	29,5
Partial safety factor	γ_{Ms} 1)	[-]	1,56			
Ductility factor	k_7	[-]	1,0			
Steel failure with level arm						
Characteristic bending moment, Anchor type TOP, TOP BU, TOP BP	$M^0_{Rk,s}$	[Nm]	12,2	30,0	59,8	104,8
Partial safety factor	γ_{Ms} 1)	[-]	1,25			
Characteristic bending moment, Anchor type TOP A4, TOP BU A4	$M^0_{Rk,s}$	[Nm]	10,7	26,2	52,3	91,7
Partial safety factor	γ_{Ms} 1)	[-]	1,56			
Concrete pry out failure						
Pryout factor	k_8	[-]	1,0	1,0	1,0	2,0
Concrete edge failure						
Effective length of anchor in shear loading	l_f	[mm]	39,5	44,5	51,5	63,0
Effective external diameter of anchor	d_{nom}	[mm]	10	12	14	18

1) In absence of other national regulations.

Table C4: Displacements under shear loads

Anchor size			**M6**	**M8**	**M10**	**M12**
Shear load	V	[kN]	5,1	6,9	7,6	9,5
Displacement	δ_{V0}	[mm]	6,0	5,3	5,3	5,0
	$\delta_{V\infty}$	[mm]	9,0	8,0	8,0	7,5

Vorpa Heavy-duty anchor TOP	**Annex C 2**
Performances Design method A, Characteristic values of resistance under shear loads Displacements under shear loads	