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-14/0403 of 2 July 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 Midle duty Anchor VHS-C
Product family to which the construction product belongs	Mechanical fastener for use in concrete
Manufacturer	VORPA srl Via S. Leo 5 47838 Riccione (RN) ITALIEN
Manufacturing plant	Vorpa srl.
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-14/0403 issued on 9 January 2015

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Specific Part

1 Technical description of the product

The Vorpa Midle duty anchor VHS-C in the range of M6, M8, M10 and M12 is an anchor made of galvanised 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 2 July 2025 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

beglaubigt:
Ziegler

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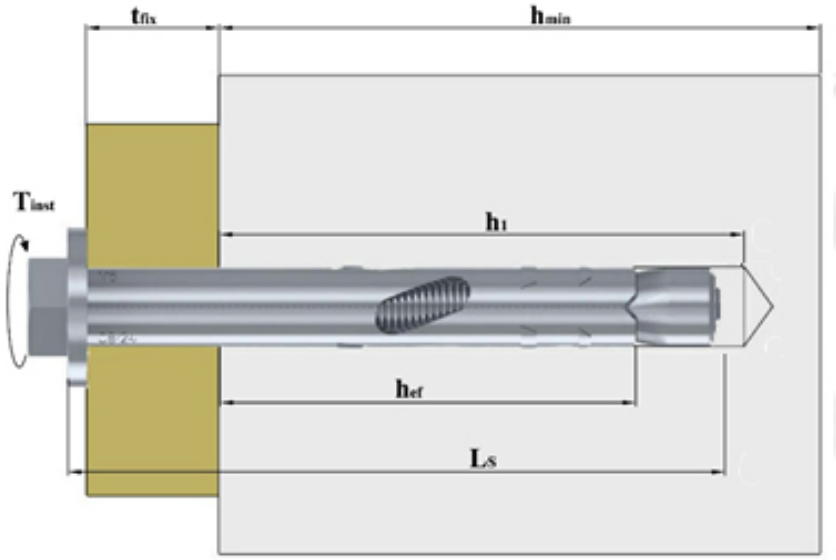
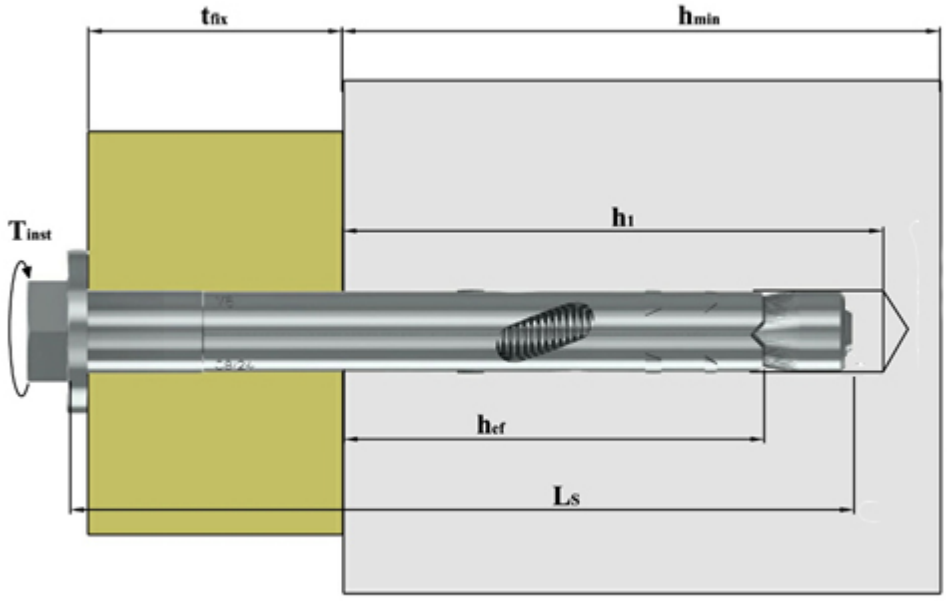
Installed condition

Through-setting Installation of the Vorpa Middle-duty anchor VHS-C:





Vorpa Midle duty Anchor VHS-C	**Annex A1**
Product description Installed condition	

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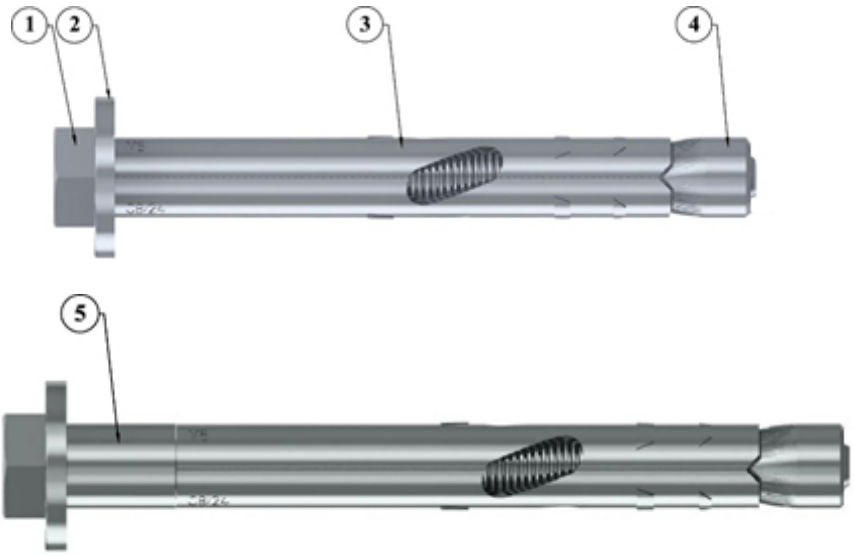
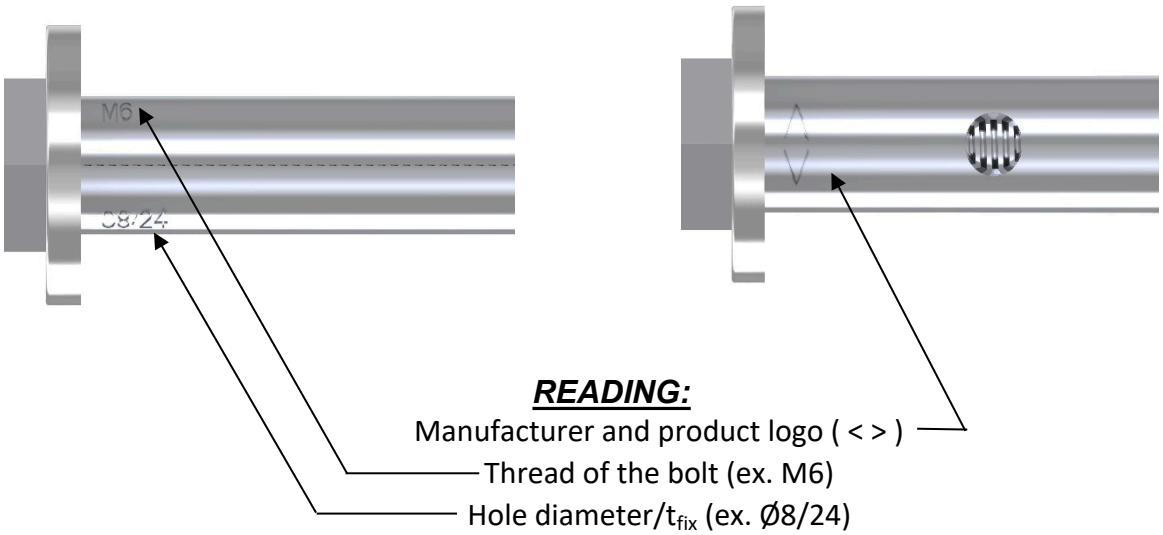
Denomination and Marking



COMPONENTS:

1 – Hexagonal head bolt
2 – Washer
3 – Expander
4 – Conical nut
5 – Extension (for some dimensions only)



READING:

Manufacturer and product logo (< >)
Thread of the bolt (ex. M6)
Hole diameter/t_{fix} (ex. Ø8/24)

Vorpa Midle duty Anchor VHS-C	**Annex A2**
Product description Marking and denomination	

Table A1: Materials and components

COMPONENT	DENOMINATION	DIMENSIONS	MATERIAL
1	Hexagonal head bolt	All	Steel, property class 8.8 EN ISO 898-1:2013 *Electrolytic zinc plated ≥ 5µm according to EN ISO 4042:2022*
2	Washer	All	Steel, DD11 according to EN 10111:2008 *Electrolytic zinc plated ≥ 5µm according to EN ISO 4042:2022*
3	Expander	All	Steel, DC01 according to EN 10139:2016+A1:2020 – EN 10130:2006 *Electrolytic zinc plated ≥ 5µm according to EN ISO 4042:2022*
4	Conical nut	All	Steel, DC01-DC04 according to EN 10139:2016+A1:2020 *Electrolytic zinc plated ≥ 5µm according to EN ISO 4042:2022*
5	Extension	8/54-100 10/45-100 10/65-120 12/45-100 12/65-120 16/50-130	Steel, DC01 according to EN 10139:2016+A1:2020 – EN 10130:2006 *Electrolytic zinc plated ≥ 5µm according to EN ISO 4042:2022*

Vorpa Midle duty Anchor VHS-C

Product description
Materials

Annex A3

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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):

- Anchorages subject to dry internal conditions (zinc coated 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 Midle duty Anchor VHS-C	**Annex B1**
Intended Use Specifications	

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Table B1: Installation parameters

Anchor size			M6 / ø8	M8 / ø10	M10 / ø12	M12 / ø16
Effective anchorage depth	h_{ef}	[mm]	31	35	40	60
Nominal drill hole diameter	d_0	[mm]	8	10	12	16
Drill hole depth	$h_1 \geq$	[mm]	50	55	60	85
Clearance hole in the fixture	d_f	[mm]	10	12	14	18
Torque moment	T_{inst}	[Nm]	10	25	40	65
Minimum fixture thickness	$T_{fix,min}$	[mm]	1	1	1	1
Maximum fixture thickness	$T_{fix,max}$	[mm]	24/54	25/45/65	25/45/65	10/30/50
Hexagonal head bolt length	L_s	[mm]	70/100	75/100/120	80/100/120	90/110/130

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

Anchor size			M6 / ø8	M8 / ø10	M10 / ø12	M12 / ø16
Minimum thickness of the member	h_{min}	[mm]	80	100	120	150
Minimum spacing	s_{min}	[mm]	95	120	145	175
Minimum edge distance	c_{min}	[mm]	50	60	75	90

Vorpa Midle duty Anchor VHS-C	**Annex B2**
Intended Use Installation parameters Minimum thickness of concrete member, minimum spacing and edge distance	

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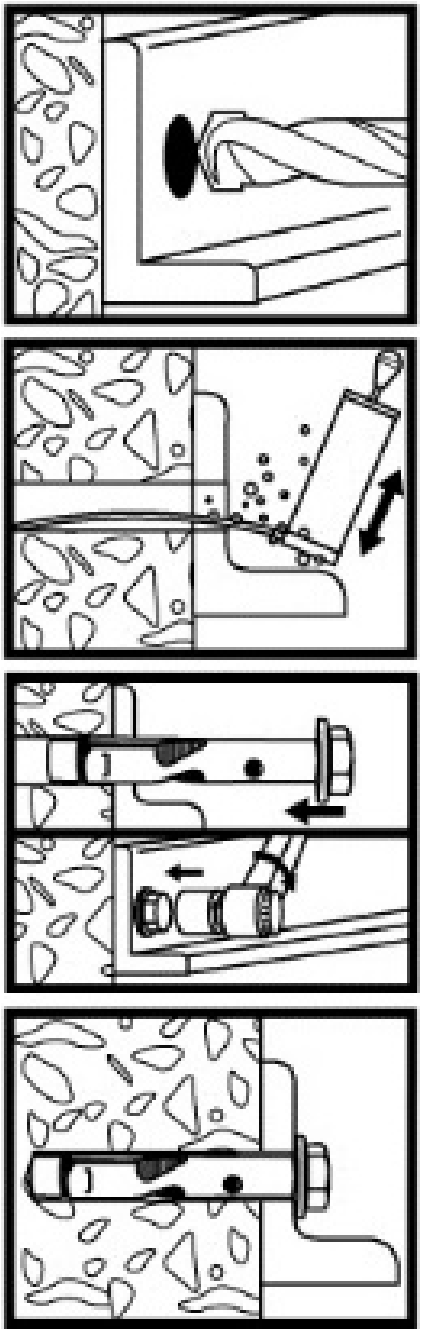
Installation instruction



1. Make a drill hole with a hammer drilling
2. Clean the drill hole
3. Place the anchor
4. Apply the required installation torque

Vorpa Midle duty Anchor VHS-C	**Annex B3**
Intended Use Installation instruction	

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

Anchor size			M6 / ø8	M8 / ø10	M10 / ø12	M12 / ø16
Steel failure						
Characteristic resistance	$N_{Rk,s}$	[kN]	16,1	29,3	46,4	67,4
Partial safety factor	γ_{MS} [1)]	[-]	1,5			
Pullout failure						
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	6,0	7,5	12,0	20,0
Increasing factor for concrete $N_{Rk,p} = \Psi_c \times N_{Rk,p}$ (C20/25)	ψ_C	C30/37	1,0			
		C40/50				
		C50/60				
Concrete cone failure						
Effective anchoring depth	h_{ef}	[mm]	31	35	40	60
Spacing	$s_{cr,N}$	[mm]	3 h_{ef}			
Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}			
Factor uncracked concrete	$k_{ucr,N}$	[-]	10,1			
Splitting failure						
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,sp}$	[kN]	Min ($N_{Rk,p}$; $N^0_{Rk,c}$ [2)])			
Spacing	$s_{cr,sp}$	[mm]	200	300	340	430
Edge distance	$c_{cr,sp}$	[mm]	100	150	170	215
Installation safety factor	γ_{inst}	[-]	1,0			

[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 / ø8	M8 / ø10	M10 / ø12	M12 / ø16
Tension load	N	[kN]	3,4	5,2	5,3	11,6
Displacement	δ_{N0}	[mm]	0,10	0,19	0,39	0,51
	$\delta_{N\infty}$	[mm]	-	-	0,39	-

Vorpa Midle duty Anchor VHS-C

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

Annex C1

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

Anchor size			M6 / ø8	M8 / ø10	M10 / ø12	M12 / ø16
Steel failure without level arm						
Characteristic resistance	$V_{Rk,s}$	[kN]	7,5	12,0	20,0	30,0
Partial safety factor	γ_{MS} [1)]	[-]	1,25			
Steel failure with lever arm						
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	12,2	30,0	59,8	104,8
Partial safety factor	γ_{MS} [1)]	[-]	1,25			
Concrete pry out failure						
Pryout factor	k_8	[-]	1,0			2,0
Installation safety factor	γ_{inst}	[mm]	1,0			
Concrete edge failure						
Effective length of anchor in shear loading	l_f	[mm]	31	35	40	60
Effective external diameter of anchor	d_{nom}	[mm]	8	10	12	16

[1)] In absence of other national regulations.

Table C4: Displacements under shear loads

Anchor size			M6 / ø8	M8 / ø10	M10 / ø12	M12 / ø16
Shear load	V	[kN]	3,8	7,0	11,0	16,1
Displacement	δ_{V0}	[mm]	1,1	1,4	2,6	2,7
	$\delta_{V\infty}$	[mm]	1,6	2,1	3,9	4,1

Vorpa Midle duty Anchor VHS-C

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

Annex C2