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Authorised and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

MEMBER OF EOTA

European Technical Assessment ETA-20/0286 of 2020/03/12

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:	EJOT Through Bolt BA-C NC Torque controlled expansion anchor
Product family to which the above construction product belongs:	Mechanical fasteners for use in non-cracked concrete
Manufacturer:	EJOT Baubefestigungen GmbH In der Stockwiese 35 D-57334 Bad Laasphe Tel. +49 2752 908-0 Internet www.ejot.de
Manufacturing plant:	EJOT Baubefestigungen GmbH Manufacturing plant 45
This European Technical Assessment contains:	12 pages including 7 annexes which form an integral part of the document
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	EAD 330232-00-0601; Mechanical fasteners for use in concrete
This version replaces:	

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

Technical description of the product
EJOT Through Bolt BA-C NC is a torque controlled expansion anchor made of galvanized steel. The anchor is installed in a drilled hole and anchored by torque-controlled expansion.

An illustration of the product is given in Annex A.

The characteristic material values, dimensions and tolerances of the anchors not indicated in Annexes shall correspond to the respective values laid down in the technical documentation of this European Technical Assessment.

The anchors are intended to be used with embedment depth given in Annex B, Table B1. The intended use specifications of the product are detailed in the Annex B1.

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 intended 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 or Assessment Body, 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 Characteristics of product

Mechanical resistance and stability (BWR 1):
The essential characteristics are detailed in Annex C1 and C2.

Safety in case of fire (BWR 2):
No performance assessed.

Safety in use (BWR4):
For basic requirement Safety in use the same criteria are valid for Basic Requirement Mechanical resistance and stability (BWR1).

Sustainable use of natural resources (BWR7)
No performance determined

Other Basic Requirements are not relevant.

3.2 Methods of assessment

The assessment of fitness of the anchor for the intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Basic Works Requirements 1 and 4 has been made in accordance with EAD 330232-00-0601; Mechanical fasteners for use in concrete.

4 Assessment and verification of constancy of performance (AVCP)

4.1 AVCP system

According to the decision 1996/582/EC of the European Commission, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 1.

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

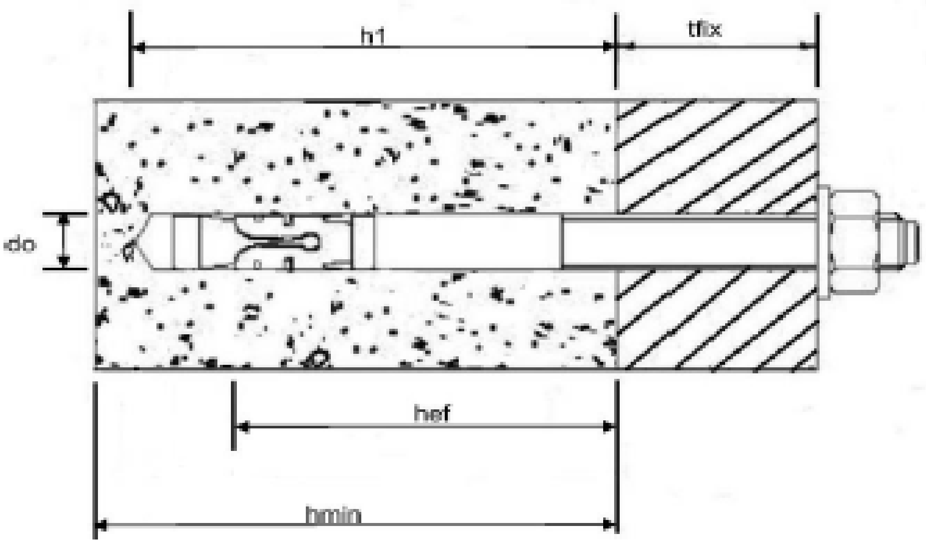
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking

Issued in Copenhagen on 2020-03-012 by

Thomas Bruun
Managing Director, ETA-Danmark

Figure A1 EJOT Through Bolt BA-C NC

Product and installed conditions



d_0	=	nominal drill bit diameter
h_1	=	depth of drilles hole to deepest point
h_{min}	=	minimum thickness of concrete member
h_{ef}	=	effective anchorage depth
t_{fix}	=	thickness of the fixture

EJOT Through Bolt BA-C NC	**Annex A1** of European Technical Assessment ETA-20/0286
Product description Characteristics of the product	

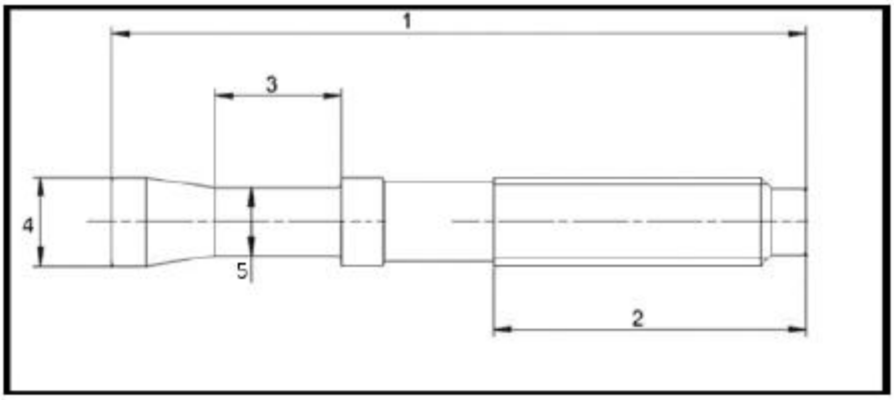
Table A1. Dimensions of the anchor

Anchor size	1 Length of bolt L_s [mm]	2 Length of thread L_o [mm]	3 Length of shaft L_o [mm]	4 Diameter outside d_o [mm]	5 Diameter cone inside d_{oo} [mm]	Wrench size SW [-]
M8	75-135	35-95	14.4	8	5.8	13
M10	85-215	37-160	16.5	10	7.4	17
M12	110-320	55-180	19.0	12	9.1	19
M16	135-320	60-190	23.0	16	12.3	24

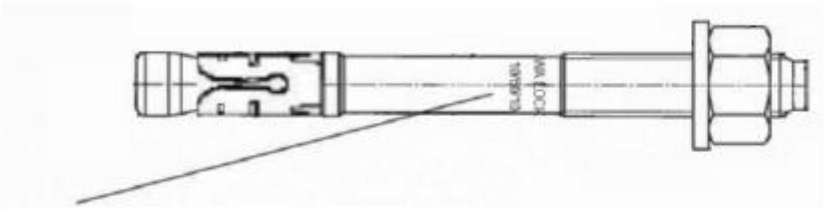
Table A2. Materials

Member	Material		nominal characteristic steel yield strength f_{yk} [N/mm²]	nominal characteristic steel ultimate strength f_{uk} [N/mm²]
Bolt	cold draw wire C-1035 cold headed quality	M8	≥ 410	≥ 550
		M10	≥ 540	≥ 670
		M12	≥ 500	≥ 630
		M16	≥ 510	≥ 600
Clip	Cold steel strip acc. EN 10130, C1020-C1045	-	-	
Washer	Steel acc. DIN 125 zinc plated	-	-	
Hex-nut	steel acc. DIN 934 zinc plated	-	-	

Figure A3 – Markings



Marking:



NC M/t_{fix} e.g. NC 8/10

EJOT Through Bolt BA-C NC	**Annex A3** of European Technical Assessment ETA-20/0286
Product description Markings	

Use:
The anchors are intended to be used for anchorages for which requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirements 1 and 4 of Regulation 305/2011 (EU) shall be fulfilled and failure of anchorages made with these products would compromise the stability of the works, cause risk to human life and/or lead to considerable economic consequences.

Anchors subject to:
- Static and quasi-static loads: sizes M8, M10, M12 and M16.

Base materials:
- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum to C50/60 at maximum according to EN 206-1.
- Non-cracked concrete: sizes M8, M10, M12 and M16.

Temperature range:
The anchors may be used in the following temperature range:
- Normal internal temperature ranges

Use conditions (Environmental conditions):
- The anchors may be used in structures subject to dry internal conditions only.

Installation:
- The anchors may be installed in:
- Dry concrete: sizes M8, M10, M12 and M16.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Anchor installation in accordance with the manufacturer's specifications and drawings and using the
- appropriate tools.
- Hammer drilling only
- Check before placing the anchor to ensure that the strength class of the concrete, in which the anchor is to be placed, is identical with the values which the characteristic loads apply.
- Check of concrete being well compacted, e.g. without significant voids.
- Edge distances and spacings not less than the specified values without minus tolerances.
- Positioning of the drill holes without damaging the reinforcement.
- Anchor installation such that the effective anchorage depth is complied with; the compliance is ensured if the thickness of the fixture is not larger than the maximum values given in Annex B2.
- Anchor expansion by impact on the wedge of the anchor; the anchor is properly set if the wedge is fully dropped in.

Proposed design methods:
- 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 transmitted. 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 under static and quasi-static loads are designed in accordance with EOTA TR 055 or EN 1992-4

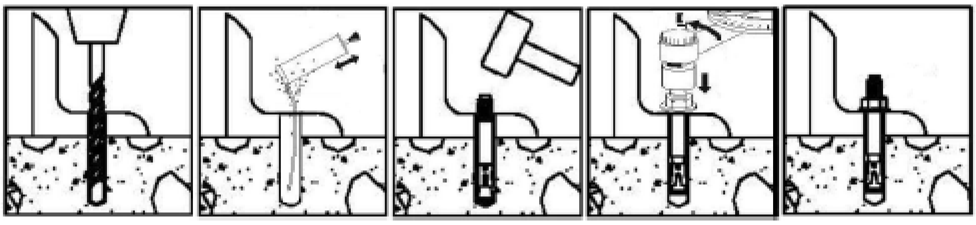
Table B1. Installation parameters

Installation parameters				M8	M10	M12	M16
Nom. drill hole diameter	Ø d_0	[mm]	=	8	10	12	16
Max. Cutting diameter of drill bit	Ø d_{cut}	[mm]	≤	8.45	10.45	12.50	16.50
Depth of drill hole	h_1	[mm]	≥	63	69	92	109
Effective anchorage depth	h_{ef}	[mm]	≥	43	50	70	85
Installation moment	T_{inst}	[Nm]	=	15	30	50	90

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

				M8	M10	M12	M16
Minimum thickness of member	h_{min}	[mm]	=	100	120	150	160
Minimum edge distance	c_{min}	[mm]	=	50	90	100	125
Minimum spacing	s_{min}	[mm]	=	50	100	120	140

<u>Installation instructions</u>



1. Drill the hole by hammer drilling
2. Clean the drill hole from dust
3. Drive in anchor (observe min. setting depth)
4. Apply installation torque T_{inst} by using calibrated torque wrench
5. Installation process is finished

EJOT Through Bolt BA-C NC	Annex B2 of European Technical Assessment ETA-20/0286
Intended use – installation parameters	

Table C1: Design method A according to EOTA TR 055 or EN 1992-4, characteristic tension load values

			M8	M10	M12	M16
Steel failure						
Resistance to steel failure	$N_{Rk,s}$	[kN]	14,04	28,04	40,08	68,99
Partial safety factor under tension load	γ_{Ms}	[-]	1,61	1,49	1,51	1,41
Pull-out failure						
Resistance to pull-out failure in non-cracked concrete C20/25	$N_{Rk,p,ucr}$	[kN]	11,00	13,00	17,00	22,00
Increase factors for non-cracked concrete in C50/60	Ψ_c	[-]	1,11	1,55	1,55	1,55
Concrete cone failure						
Effective embedment depth	h_{ef}	[mm]	43	50	70	85
Edge distance	$c_{cr,N}$	[mm]	$1,5xh_{ef}$	$1,5xh_{ef}$	$1,5xh_{ef}$	$1,5xh_{ef}$
Spacing	$s_{cr,N}$	[mm]	$3xh_{ef}$	$3xh_{ef}$	$3xh_{ef}$	$3xh_{ef}$
Robustness						
Installation safety factor	γ_{inst}	[-]	1.2	1.0	1.2	1.0
Minimum edge distance and spacing						
Minimum edge distance	c_{min}	[mm]	50	90	100	125
Minimum spacing distance	s_{min}	[mm]	50	100	120	140
Min. thickness of the concrete member	h_{min}	[mm]	100	120	150	160
Edge distance to prevent splitting under load						
	$N^0_{Rk,sp}$	[kN]	13,87	17,39	28,81	38,55
Appropriate edge distance	$c_{cr,sp}$	[mm]	50	90	120	160
Displacements under static and quasi-static loading						
Short time tension displacement	δ_{N0}	**[mm]**	0,38	1,08	0,81	1,62
Long-time tension displacement	$\delta_{N\infty}$	**[mm]**	-	-	1,96	-

EJOT Through Bolt BA-C NC

Performance for static and quasi-static loads: Resistances

Annex C1
of European
Technical Assessment
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Table 21: Design method A according to EOTA TR 055 or EN 1992-4, characteristic shear load values

			M8	M10	M12	M16
Resistance to steel failure under shear load						
Resistance to shear load without lever arm	$V^0_{Rk,s}$	[kN]	7,00	13,00	20,00	34,00
Resistance to pry-out failure						
Factor for pry-out failure	k_8	[-]	1,0	1,0	2,0	2,0
Resistance to concrete edge failure						
Outside diameter of the fastener relevant for shear loading	d_{nom}	[mm]	8	10	12	16
Effective length of the fastener for transfer of shear load	l_f	[mm]	43	50	70	85
Displacements under static and quasi-static loading						
Short time shear displacement	δ_{V0}	**[mm]**	0,99	1,76	1,53	1,77
Long-time shear displacement	$\delta_{V\infty}$	**[mm]**	1,49	2,64	2,30	2,66