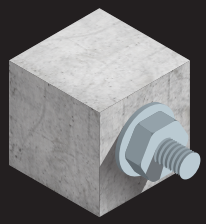
EUROPEAN TECHNICAL ASSESSMENT

BZ



EUROPEAN TECHNICAL ASSESSMENT
11/0124

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European Technical Assessment

ETA-11/0124 of 29/06/2018

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	THROUGHBOLT BZ
Product family to which the construction product belongs	Torque controlled expansion anchor of sizes M6, M8, M10, M12, M16 and M20 for use in non-cracked concrete
Manufacturer	SCELL-IT 28 Rue Paul Dubrule 59810 Lesquin France
Manufacturing plant	Scell-It Plant 3
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	European Assessment Document (EAD) 330232-00-0601 "Mechanical fasteners for use in concrete"
This version replaces	ETA-11/0124 issued on 30/09/2014

This European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Specific Part

1 Technical description of the product

The THROUGHBOLT BZ anchor in the sizes of M6, M8, M10, M12, M16 and M20 is an anchor made of galvanized steel which is placed into a drill hole and anchored by torque-controlled expansion.

An illustration and the description of the anchor are given in Annex A.

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

The performances given in Annex C 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 or Technical 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 Performance of the product

3.1.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance for tension loads, displacements	Annex C1
Characteristic resistance for shear loads, displacements	Annex C2

3.1.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchors satisfy requirements for Class A1
Resistance to fire	No performance assessed

3.2 Methods used for the assessment

The assessment of fitness of anchors for the declared intended use has been made in accordance with the EAD 330232-00-0601 "Mechanical fasteners for use in concrete".

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

According to the Decision 96/582/EC of the European Commission the system 1 of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) applies.

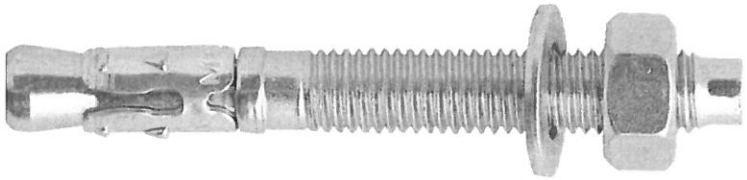
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document (EAD)

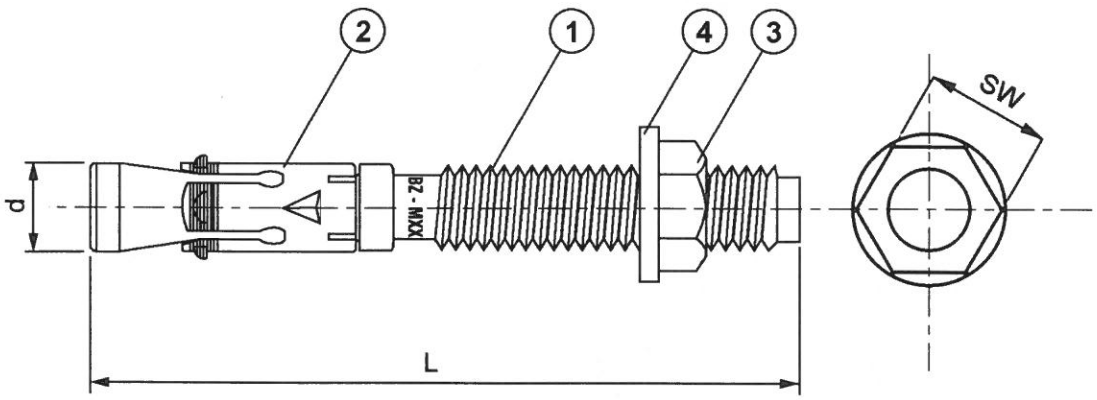
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

For the type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 29/06/2018 by Instytut Techniki Budowlanej

Anna Panek, MSc
Deputy Director of ITB





1 – Threaded bolt

2 – Expansion clip

3 – Hexagonal nut

4 – Washer

THROUGHBOLT BZ	**Annex A1**
Product description Anchor	of European Technical Assessment ETA-11/0124

Table A1: THROUGHBOLT BZ anchor dimensions

Size	Marking	d [mm]	L [mm]	L_{clip} (1) [mm]	SW [mm]	t_{fix} (2) [mm]
M6	BZ-06 x 45	6	45	13,0 – 13,5	10	5
	BZ-06 x 55		55			15
	BZ-06 x 85		85			45
M8	BZ-08 x 50	8	50	15,0 – 15,5	13	2
	BZ-08 x 65		65			15
	BZ-08 x 70		70			20
	BZ-08 x 80		80			30
	BZ-08 x 95		95			45
	BZ-08 x 100		100			50
	BZ-08 x 105		105			55
	BZ-08 x 115		115			65
	BZ-08 x 130		130			80
	BZ-08 x 165		165			115
M10	BZ-10 x 65	10	65	17,4 – 17,9	17	5
	BZ-10 x 80		80			20
	BZ-10 x 95		95			35
	BZ-10 x 110		110			50
	BZ-10 x 120		120			60
	BZ-10 x 150		150			90
	BZ-10 x 180		180			120
	BZ-10 x 220		220			160
M12	BZ-12 x 80	12	80	20,4 – 20,9	19	2
	BZ-12 x 100		100			20
	BZ-12 x 120		120			40
	BZ-12 x 125		125			45
	BZ-12 x 135		135			55
	BZ-12 x 180		180			100
	BZ-12 x 200		200			120
	BZ-12 x 220		220			140
	BZ-12 x 240		240			160
M16	BZ-16 x 105	16	105	23,7 – 24,2	24	10
	BZ-16 x 115		115			20
	BZ-16 x 125		125			30
	BZ-16 x 140		140			45
	BZ-16 x 180		180			85
	BZ-16 x 200		200			105
	BZ-16 x 220		220			125
	BZ-16 x 240		240			145
	BZ-16 x 280		280			185
M20	BZ-20x 130	20	130	28,5 – 29,0	30	15
	BZ-20x 160		160			45
	BZ-20x 215		130			100

(1) –expansion clip length
(2) – thickness of fixture

THROUGHBOLT BZ	**Annex A2** of European Technical Assessment ETA-11/0124
Product description Dimensions	

Table A2: Materials

Designation	Material	Protection
Threaded bolt	Carbon steel class 5.8 acc. to EN 898-1	Zinc plated ≥ 5 µm acc. to EN ISO 4042
Expansion clip	Carbon steel	Zinc plated ≥ 5 µm acc. to EN ISO 4042
Hexagonal nut	Carbon steel class 5.8 acc. to EN 898-2	Zinc plated ≥ 5 µm acc. to EN ISO 4042
Washer	Carbon steel	Zinc plated ≥ 5 µm acc. to EN ISO 4042

Specification of intended use

Anchorages subject to:
- Static and quasi-static loads.

Base material:
- Non-cracked concrete.
- Reinforced or unreinforced normal weight concrete of strength classes C20/25 at minimum and C50/60 at maximum according to EN 206.

Use conditions (environmental conditions):
- Structures subject to dry internal conditions.

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 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 Technical Report TR 055 (ETAG 001 Annex C design method A, CEN/TS 1992-4-4:2009 and prEN 1992-4:2016).

Installation of anchors:
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Effective anchorage depth, edge distances and spacings not less than the specified values without minus tolerances.
- Positioning of the drill holes without damaging the reinforcement.
- Hole drilling by hammer drill.
- 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.

THROUGHBOLT BZ	**Annex B1** of European Technical Assessment ETA-11/0124
Intended use Specifications	

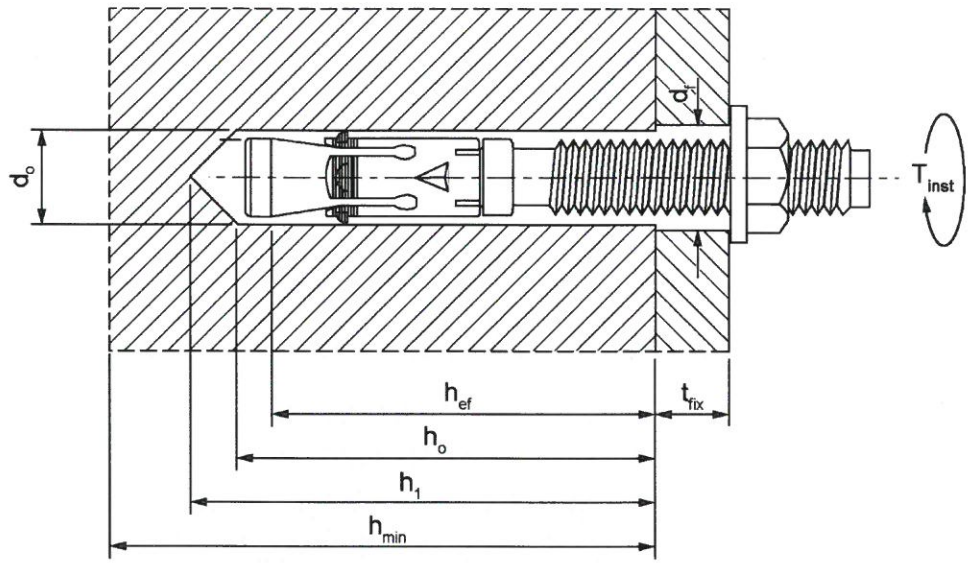
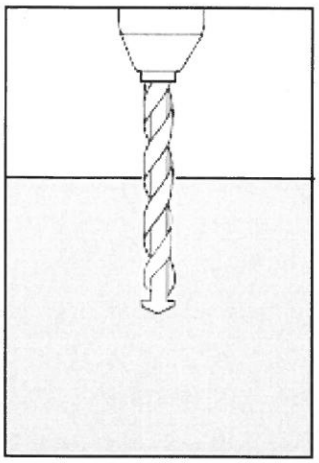
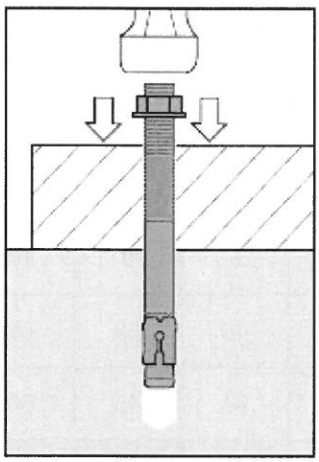


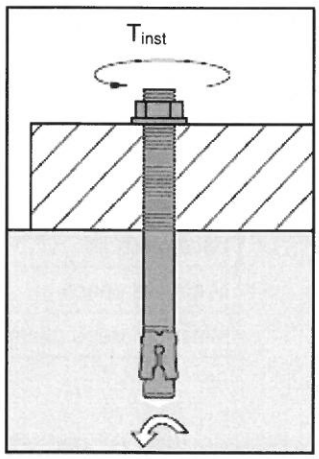
Table B1: Installation parameters

Anchor size		M6	M8	M10	M12	M16	M20
Nominal drill hole diameter	d_o [mm]	6	8	10	12	16	20
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	45	55	65	80	90	125
Depth of cylindrical drill hole	$h_o \geq$ [mm]	38	45	55	70	80	100
Effective anchorage depth	h_{ef} [mm]	30	40	50	65	75	90
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	7	9	12	14	18	22
Installation torque moment	T_{inst} [Nm]	8	15	25	40	80	200
Minimum thickness of base material	h_{min} [mm]	100	100	100	110	120	180
Minimum spacing	s_{min} [mm]	41	54	68	88	108	122
Minimum edge distance	c_{min} [mm]	41	54	68	88	108	122

THROUGHBOLT BZ	**Annex B2** of European Technical Assessment ETA-11/0124
Intended use Installation parameters	







THROUGHBOLT BZ	**Annex B3** of European Technical Assessment ETA-11/0124
Intended use Installation instruction	

Table C1: Characteristic resistance for tension loads in non-cracked concrete (static and quasi-static loading)

Anchor size			M6	M8	M10	M12	M16	M20
Steel failure								
Characteristic resistance		$N_{Rk,s}$ [kN]	10,05	14,20	19,30	31,80	56,60	122,50
Partial safety factor		γ_{Ms} [1)]	1,5					
Pull-out failure								
Characteristic resistance in non-cracked concrete C20/25		$N_{Rk,p}$ [kN]	6	9	12	20	35	48
Installation safety factor		γ_2 [2)] = γ_{inst} [3) 4)]	1,0				1,2	1,0
Increasing factor	concrete C30/37	ψ_c	1,22					
	concrete C40/50		1,41					
	concrete C50/60		1,55					
Concrete cone failure and splitting failure								
Effective anchorage depth		h_{ef} [mm]	30	40	50	65	75	90
Factor for non-cracked concrete		k_1 [2)] = k_{ucr} [3)]	10,1	10,1	10,1	10,1	10,1	10,1
		k_1 [2)] = $k_{ucr,N}$ [4)]	11,0	11,0	11,0	11,0	11,0	11,0
Installation safety factor		γ_2 [2)] = γ_{inst} [3) 4)]	1,0				1,2	1,0
Increasing factor	concrete C30/37	ψ_c	1,22					
	concrete C40/50		1,41					
	concrete C50/60		1,55					
Characteristic resistance for splitting		$N^0_{Rk,sp}$ [4)] [kN]	6	9	12	20	35	48
Characteristic spacing	concrete cone failure	$s_{cr,N}$ [mm]	90	120	150	195	225	270
	splitting failure	$s_{cr,sp}$ [mm]	150	200	300	330	450	450
Characteristic edge distance	concrete cone failure	$c_{cr,N}$ [mm]	45	60	75	100	115	135
	splitting failure	$c_{cr,sp}$ [mm]	75	100	150	165	225	225

[1)] in the absence of other national regulations

[2)] parameter for design according to ETAG-001 Annex C

[3)] parameter for design according to CEN/TS 1992-4-4:2009

[4)] parameter for design according to prEN 1992-4:2016

Table C2: Displacements under tension loading

Anchor size		M6	M8	M10	M12	M16	M20
Tension load	N [kN]	2,9	4,4	6,4	9,6	14,2	22,7
Displacement	δ_{N0} [mm]	2,1	0,4	0,6	0,7	0,9	1,8
	$\delta_{N\infty}$ [mm]	1,05	1,05	1,05	1,05	1,05	1,05

THROUGHBOLT BZ	**Annex C1** of European Technical Assessment ETA-11/0124
Performances Characteristic resistance for tension loads in non-cracked concrete, displacements	

Table C3: Characteristic resistance for shear loads (static and quasi-static loading)

Anchor size		M6	M8	M10	M12	M16	M20
Steel failure without lever arm							
Characteristic resistance	$V_{Rk,s}$ [2)3)] = $V^0_{Rk,s}$ [4)] [kN]	5,00	5,5	8,7	12,6	23,6	51,0
Ductility factor	k [2)] = k_2 [3)] = k_7 [4)]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [1)]	1,25					
Steel failure with lever arm							
Characteristic bending resistance	$M^0_{Rk,s}$ [Nm]	7,63	15,00	29,90	52,40	133,2	324,78
Partial safety factor	γ_{Ms} [1)]	1,25					
Concrete pry-out failure							
Factor	k [2)] = k_3 [3)] = k_8 [4)]	1,0				2,0	
Partial safety factor	γ_{Mc} [1)]	1,5				1,8	1,5
Concrete edge failure							
Effective length of anchor under shear loading	l_f [mm]	30	40	50	65	75	90
Outside diameter of anchor	d_{nom} [mm]	6	8	10	12	16	20
Partial safety factor	γ_{Mc} [1)]	1,5				1,8	1,5

[1)] in the absence of other national regulations
[2)] parameter for design according to ETAG-001 Annex C
[3)] parameter for design according to CEN/TS 1992-4-4:2009
[4)] parameter for design according to prEN 1992-4:2016

Table C4: Displacements under shear loading

Anchor size		M6	M8	M10	M12	M16	M20
Shear load	V [kN]	3,4	5,5	7,0	9,2	13,1	26,0
Displacement	δ_{V0} [mm]	1,6	1,5	1,6	2,1	2,5	2,0
	$\delta_{V\infty}$ [mm]	2,4	2,3	2,4	3,2	3,8	3,0

THROUGHBOLT BZ	**Annex C2** of European Technical Assessment ETA-11/0124
Performances Characteristic resistance for shear loads, displacements	