INSTYTUT TECHNIKI BUDOWLANEJ
PL 00-611 WARSZAWA
ul. FILTROWA 1
tel.: (+48 22) 825-04-71
(+48 22) 825-76-55
fax: (+48 22) 825-52-86
www.itb.pl

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

Member of EOTA

European Technical Assessment

ETA-12/0436

KWA THROUGHBOLT

Torque controlled expansion anchor of sizes M8, M10, M12 and M16 for use in non-cracked concrete

Kotwy rozporowe z kontrolowanym momentem dokręcenia o średnicach M8, M10, M12 i M16 do wykonywania zamocowań w betonie niezarysowanym

---

Europejska Organizacja ds. Oceny Technicznej

European Organisation for Technical Assessment

INSTYTUT TECHNIKI BUDOWLANEJ
PL 00-611 WARSZAWA
ul. Filtrowa 1
tel.: (+48 22) 825-04-71
(+48 22) 825-76-55
fax: (+48 22) 825-52-86
www.itb.pl

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organization for Technical Assessment)

Member of EOTA
www.eota.eu

European Technical Assessment

ETA-12/0436 of 27/09/2016

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	KWA THROUGHBOLT
Product family to which the construction product belongs	Torque controlled expansion anchor of sizes M8, M10, M12 and M16 for use in non-cracked concrete
Manufacturer	Anchor Fasteners Industrial Co., Ltd 106 Lane 485, Kangyen Road, Kangshan, Kaohsiung 82060 Taiwan
Manufacturing plant	Anchor Fasteners Plant 2 China
This European Technical Assessment contains	13 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	Guideline for European Technical Approval of ETAG 001 *"Metal anchors for use in concrete"*, Part 1: Anchors in general and Part 2: *"Torque – controlled expansion anchors"*, Edition April 2013 used as European Assessment Document (EAD)
This version replaces	ETA-12/0436 issued on 18/06/2013

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.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may only be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

Specific Part

1 Technical description of the product

The KWA THROUGHBOLT anchor in the sizes of M8, M10, M12 and M16 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 product 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	Annex C1
Characteristic resistance for shear loads	Annex C2
Displacements under tension and shear loads	Annex C3

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

3.1.3 Hygiene, health and the environment (BWR 3)

Regarding the dangerous substances clauses contained in this European Technical Assessment, there may be requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

3.1.4 Safety and accessibility in use (BWR 4)

For basic requirement safety in use the same criteria are valid as for basic requirement mechanical resistance and stability.

3.1.5 Sustainable use of natural resources (BWR 7)

No performance assessed.

3.1.6 General aspects relating to fitness for use

Durability and serviceability are only ensured if the specifications of intended use according to Annex B1 are kept.

3.2 Methods used for the assessment

The assessment of fitness of the anchor for declared intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirements 1 and 4 has been in accordance with the ETAG 001*"Metal anchors for use in concrete"*, Part 1: Anchors in general and Part 2: *"Torque – controlled expansion anchors"*, on the basis of Option 7.

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

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

Product	Intended use	Level or class	System
Metal anchors for use in concrete	For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units	–	1

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

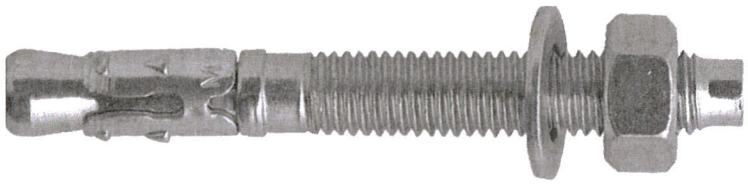
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

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.

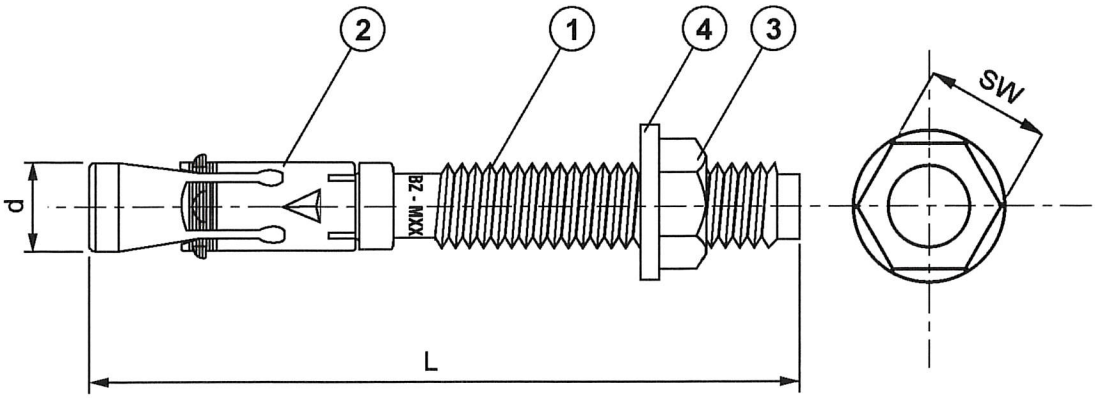
Issued in Warsaw on 27/09/2016 by Instytut Techniki Budowlanej

Marcin M. Kruk, PhD
Director of ITB

view



cross-section



1 – Threaded bolt

2 – Expansion sleeve

3 – Hexagonal nut

4 – Washer

KWA THROUGHBOLT	**Annex A1**
Product description Anchor	of European Technical Assessment ETA-12/0436

Table A1: KWA THROUGHBOLT anchor dimensions

Size	Marking	d [mm]	L [mm]	SW [mm]
M8	BZ-08 x 50	8	≥ 50	13
	BZ-08 x 65		≥ 65	
	BZ-08 x 70		≥ 70	
	BZ-08 x 80		≥ 80	
	BZ-08 x 95		≥ 95	
	BZ-08 x 100		≥ 100	
	BZ-08 x 105		≥ 105	
	BZ-08 x 130		≥ 130	
	BZ-08 x 165		≥ 165	
M10	BZ-10 x 80	10	≥ 80	17
	BZ-10 x 95		≥ 95	
	BZ-10 x 110		≥ 110	
	BZ-10 x 120		≥ 120	
	BZ-10 x 150		≥ 150	
	BZ-10 x 180		≥ 180	
	BZ-10 x 220		≥ 220	
M12	BZ-12 x 80	12	≥ 80	19
	BZ-12 x 100		≥ 100	
	BZ-12 x 120		≥ 120	
	BZ-12 x 125		≥ 125	
	BZ-12 x 135		≥ 135	
	BZ-12 x 180		≥ 180	
	BZ-12 x 200		≥ 200	
	BZ-12 x 240		≥ 240	
M16	BZ-16 x 105	16	≥ 105	24
	BZ-16 x 125		≥ 125	
	BZ-16 x 140		≥ 140	
	BZ-16 x 180		≥ 180	
	BZ-16 x 220		≥ 220	
	BZ-16 x 280		≥ 280	

KWA THROUGHBOLT	**Annex A2** of European Technical Assessment ETA-12/0436
Product description Dimensions	

Table A2: Materials

Part	Designation	Material	Protection
1	Threaded bolt	Carbon steel class 5.8 acc. to EN 898-1	Zinc plated ≥ 5 µm acc. to EN ISO 4042
2	Expansion sleeve	Carbon steel	Zinc plated ≥ 5 µm acc. to EN ISO 4042
3	Hexagonal nut	Carbon steel class 5.8 acc. to EN 898-2	Zinc plated ≥ 5 µm acc. to EN ISO 4042
4	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 (zinc coated steel).

Design:

- The anchorages are designed in accordance with the ETAG 001, edition April 2013, Annex C, Method A, under the responsibility of an engineer experienced in anchorages and concrete work.
- The position of the anchor is indicated on the design drawings.
- Verifiable calculation notes and drawings are taking account of the loads to be transmitted.

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.
- Use of the anchor only as supplied by the manufacturer without exchanging any component of the anchor.
- Anchor installation in accordance with the manufacturer's specification and drawings and using the appropriate tools.
- Effective anchorage depth, edge distances and spacings not less than the specified values without minus tolerances.
- Hole drilling by hammer drill.
- Cleaning of the hole of drilling dust.
- Application of the torque moment using a calibrated torque wrench.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance it the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load if is not in the direction of load application.

KWA THROUGHBOLT	**Annex B1** of European Technical Assessment ETA-12/0436
Intended use Specifications	

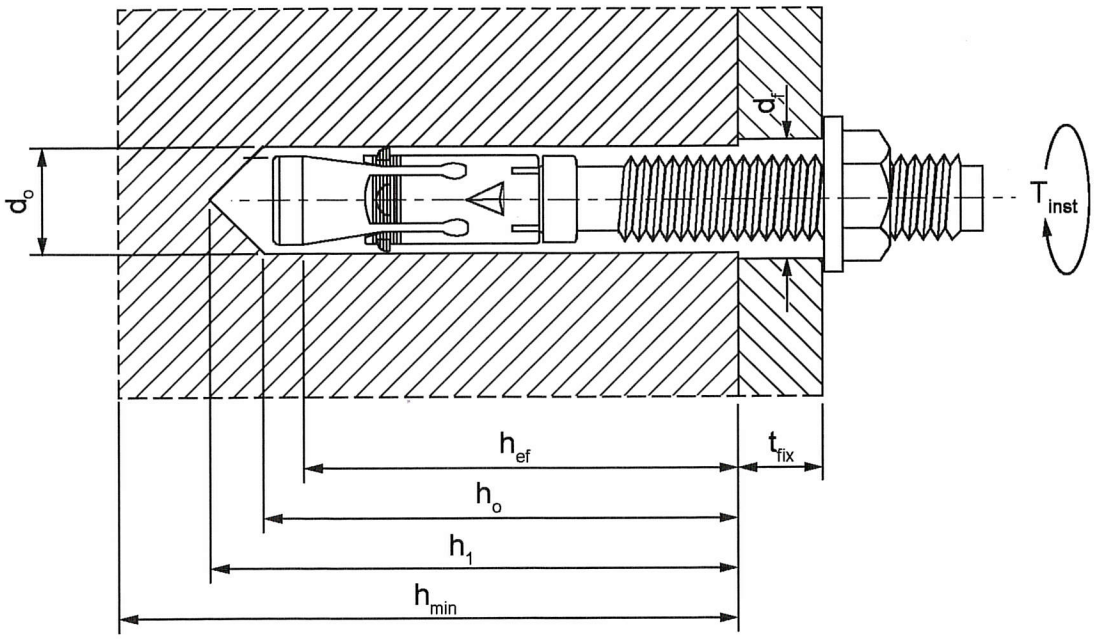
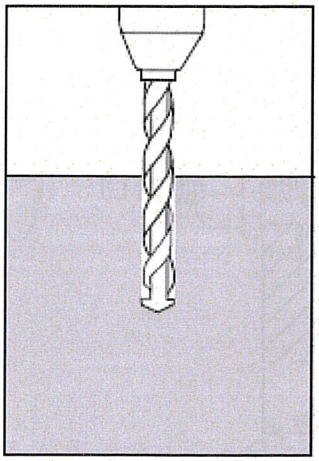
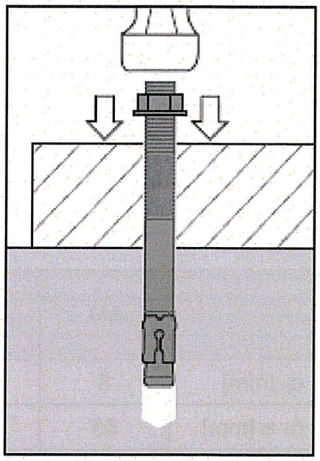


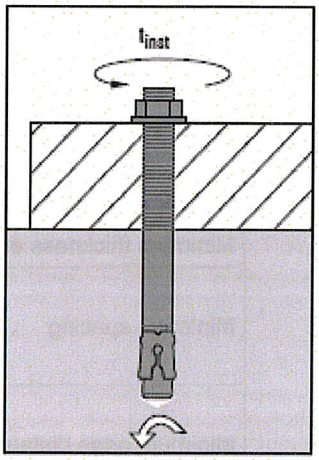
Table B1: Installation parameters

Anchor size		M8	M10	M12	M16
Nominal drill hole diameter	d_o [mm]	8	10	12	16
Depth of drill hole to deepest point	$h_1 \geq$ [mm]	55	65	80	90
Depth of cylindrical drill hole	$h_o \geq$ [mm]	45	55	70	80
Effective anchorage depth	h_{ef} [mm]	40	50	65	75
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	9	12	14	18
Installation torque moment	T_{inst} [Nm]	15	25	40	80
Minimum thickness of base material	h_{min} [mm]	100	100	110	120
Minimum spacing	s_{min} [mm]	60	75	100	115
	for c ≥ [mm]	100	150	165	225
Minimum edge distance	c_{min} [mm]	60	75	100	115
	for s ≥ [mm]	200	300	330	450

KWA THROUGHBOLT	**Annex B2** of European Technical Assessment ETA-12/0436
Intended use Installation parameters	







KWA THROUGHBOLT	**Annex B3** of European Technical Assessment ETA-12/0436
Intended use Installation instruction	

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

Anchor size		M8	M10	M12	M16
Steel failure					
Characteristic resistance	$N_{Rk,s}$ [kN]	14,2	19,3	31,8	56,6
Partial safety factor	γ_{Ms} [1)]	1,5			
Pullout failure					
Characteristic resistance in non-cracked concrete C20/25 – C 50/60	$N_{Rk,p}$ [kN]	9	12	20	35
Increasing factors for $N_{Rk,p}$	Ψ_c C30/37	1,22			1,12
	C40/50	1,41			1,23
	C50/60	1,55			1,30
Partial safety factor	γ_{Mp} [1)]	1,5 [2)]			1,8 [2)]
Concrete cone failure					
Effective anchorage depth	h_{ef} [mm]	40	50	65	75
Spacing	$s_{cr,N}$ [mm]	120	150	195	225
Edge distance	$c_{cr,N}$ [mm]	60	75	100	115
Splitting failure					
Spacing	$s_{cr,sp}$ [mm]	200	300	330	450
Edge distance	$c_{cr,sp}$ [mm]	100	150	165	225
Partial safety factor	γ_{Msc} [1)]	1,5			1,8

[1)] – in absence of other national regulations

[2)] – the partial safety factor $\gamma_2 = 1,0$ for M8 to M12 and $\gamma_2 = 1,2$ for M16

KWA THROUGHBOLT	**Annex C1** of European Technical Assessment ETA-12/0436
Performances Design method A, characteristic values for tension loads	

Table C2: Design method A, characteristic values for shear loads

Anchor size		M8	M10	M12	M16
Steel failure without lever arm					
Characteristic resistance	$V_{Rk,s}$ [kN]	5,5	8,7	12,6	23,6
Partial safety factor	γ_{Ms} [1)]	1,25			
Steel failure with lever arm					
Characteristic bending resistance	$M^0_{Rk,s}$ [Nm]	15,0	29,9	52,4	133,2
Partial safety factor	γ_{Ms} [1)]	1,25			
Concrete pryout failure					
Factor in equation (5.6) of ETAG 001 Annex C, 5.2.3.3	k	1,0			2,0
Partial safety factor	γ_{Mcp} [1)]	1,5 [2)]			1,8 [2)]
Concrete edge failure					
Effective length of anchor under shear loading	l_f [mm]	40	50	65	75
Effective diameter of anchor	d_{nom} [mm]	8	10	12	16
Partial safety factor	γ_{Mc} [1)]	1,5			1,8

[1)] – in absence of other national regulations

[2)] – the partial safety factor $\gamma_2 = 1,0$ for M8 to M12 and $\gamma_2 = 1,2$ for M16

Table C3: Displacements under tension loads

Anchor size		M8	M10	M12	M16
Tension load	N [kN]	4,4	6,4	9,6	14,2
Displacement	δ_{NO} [mm]	0,4	0,6	0,7	0,9
	$\delta_{N\infty}$ [mm]	1,05	1,05	1,05	1,05

Table C4: Displacements under shear loads

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