

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-14/0070
of 28 March 2014

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Trade name of the construction product

Product family
to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment
contains

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

Deutsches Institut für Bautechnik

AWA

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

Anchor Fasteners Industrial Co., LTD
106, Lane 485, Kangyen Rd.
KANGSHAN KAOHSIUNG
TAIWAN R.O.C

Anchor Fasteners Industrial Co. LTD, Taiwan

13 pages including 3 annexes which form an integral part
of this assessment

Guideline for European technical approval of "Metal
anchors for use in concrete", ETAG 001 Part 2: "Torque
controlled expansion anchors", Edition April 2013,
used as European Assessment Document (EAD)
according to Article 66 Paragraph 3 of Regulation (EU)
No 305/2011.

The 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.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission according to Article 25 Paragraph 3 of Regulation (EU) No 305/2011.

Specific part

1 Technical description of the product

The anchor AWA in the sizes of M8, M10, M12 and M16 is an anchor made of galvanised steel which is placed into a drilled hole and anchored by torque-controlled expansion.

Product and product description is given in Annex A.

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 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, 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 for tension and shear loads	See Annex C 1
Edge distances and spacing	See Annex C 1
Characteristic resistance for bending moments	See Annex C 2
Displacements under shear and tension loads	See Annex C 3

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorage satisfy requirements for Class A1
Resistance to fire	No performance determined (NPD)

3.3 Hygiene, health and the environment (BWR 3)

Regarding dangerous substances 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.

3.4 Safety and accessibility (BWR 4)

For Basic requirement Safety and accessibility in use the same criteria are valid as for Basic Requirement Mechanical resistance and stability.

3.5 Protection against noise (BWR 5)

Not relevant.

3.6 Energy economy and heat retention (BWR 6)

Not relevant.

3.7 Sustainable use of natural resources (BWR 7)

For the sustainable use of natural resources no performance was investigated for this product.

3.8 General aspects

The verification of durability is part of testing the essential characteristics. Durability is only ensured if the specifications of intended use according to Annex B are taken into account.

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

According to Decision 96/582/EC of the Commission of 24 June 1996 (Official Journal of the European Communities L 254 of 08.10.1996, p. 62–65) the system of assessment and verification of constancy of performance (see Annex V and Article 65 Paragraph 2 to Regulation (EU) No 305/2011) given in the following table apply.

Product	Intended use(s)	Level or class	System
Metal anchors for use in concrete	For fixing and/or supporting concrete structural elements or heavy units such as cladding and suspended ceilings	—	1

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

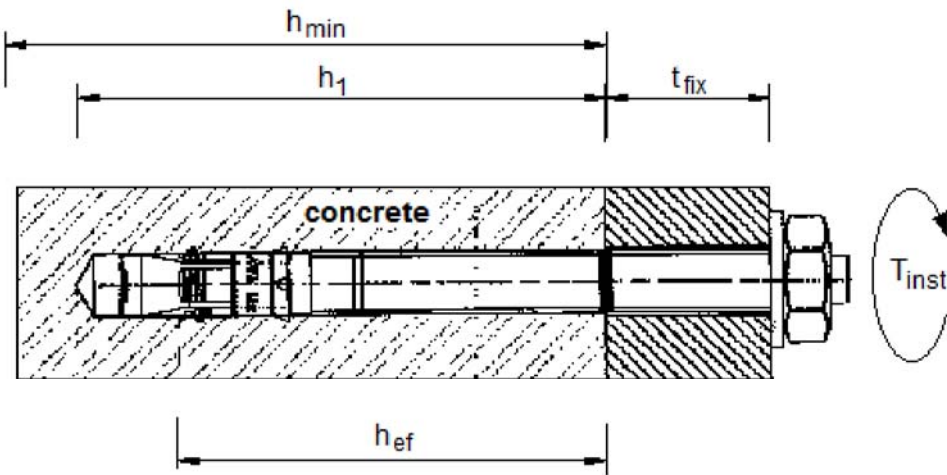
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 28 march 2014 by Deutsches Institut für Bautechnik

Gerhard Breitschaft
President

beglaubigt:
Tempel

Installation of anchor



- h_{ef} Effective anchorage depth
- t_{fix} Thickness of fixtures
- h_1 Drill hole depth
- h_{min} Min. thickness of concrete member

Wedge Anchor AWA

Product description
Installed condition

Annex A 1

Description of anchor

Marking of the wedge anchor AWA

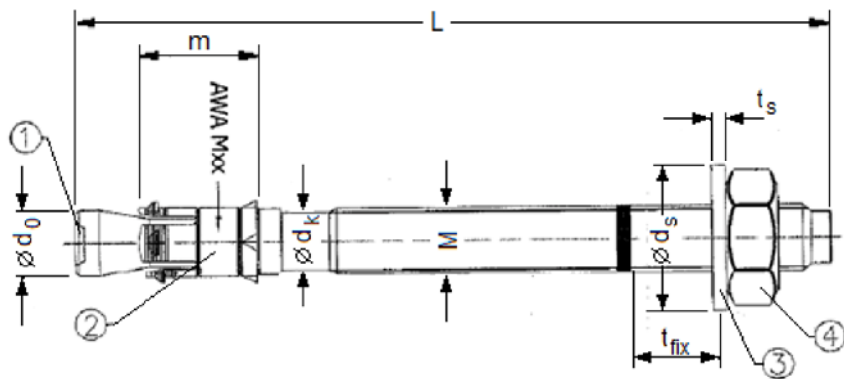
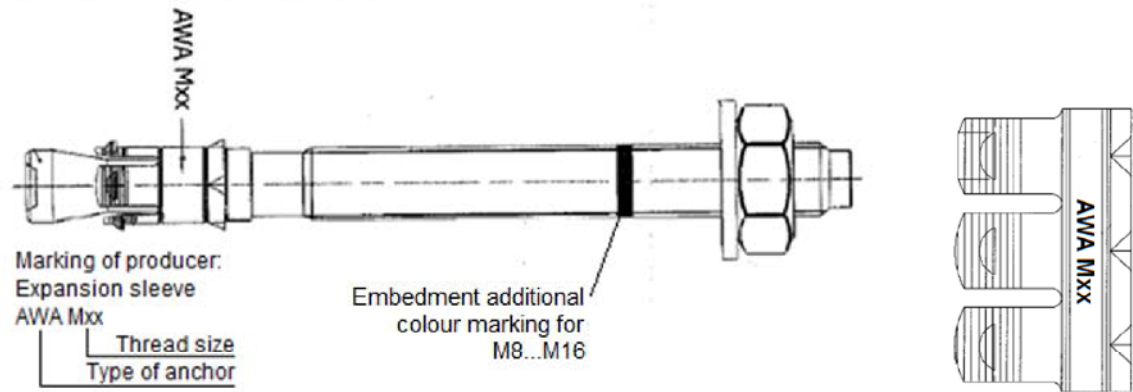


Table A1: Dimensions of the anchor

Type of anchor / size				AWA M8	AWA M10	AWA M12	AWA M16
1	Bolt	M	[-]	M8	M10	M12	M16
		Ø d ₀	[mm]	8,0	10,0	12,0	16,0
		Ø d _k	[mm]	7,05	8,90	10,7	14,6
2	Expansion sleeve	m	[mm]	13,3	17,9	21,0	24,0
		s	[mm]	1,0	1,2	1,2	2,0
3	Washer	t _s	[mm]	1,60	2,00	2,50	3,00
		Ø d _s	[mm]	17,0	21,0	24,0	30,0
4	Hexagon nut	SW	[-]	13	17	19	24
	Thickness of fixture t _{fix}	min ≤	[mm]	0	0	0	0
		max ≥	[mm]	210	260	315	400
	Length of anchor	L _{min}	[mm]	71	89	102	126
		L _{max}	[mm]	285	350	420	530

Wedge Anchor AWA

Product description
Description and dimensions of anchor

Annex A 2

Table A2: Material

1	Conical bolt	Cold form steel (AFI M8 - M16)	Zinc plated $\geq 3 \mu\text{m}$ according to EN ISO 4042
2	Expansion sleeve	Carbon steel	
3	Washer	Cold strip	
4	Hexagon nut	Steel property class 8	

Type of anchor / size			AWA M8	AWA M10	AWA M12	AWA M16
Nominal characteristic steel ultimate strength	f_{uk}	[N/mm ²]	700	620	880	660
Nominal characteristic steel yield strength	f_{yk}	[N/mm ²]	580	410	750	540

Wedge Anchor AWA

Product description
Materials

Annex A 3

Specifications of intended use

Anchorage subject to:

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

Base materials:

- Reinforced or unreinforced normal weight concrete according to EN 206-1:2000-12,
- Strength classes C20/25 to C50/60 according to EN 206-1:2000-12,
- Non-cracked concrete: sizes M8, M10, M12, M16.

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 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 ETAG 001, Annex C, design method A, Edition August 2010.

Installation:

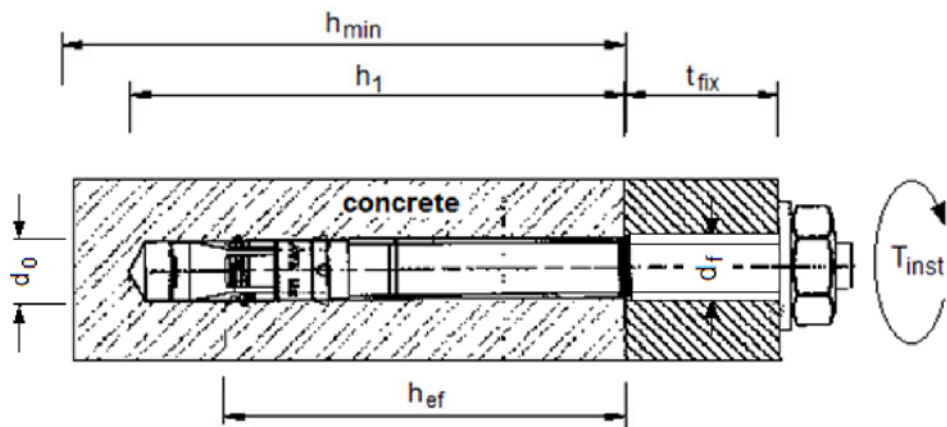
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site,
- Check of concrete being well compacted, e.g. without significant voids,
- Positioning of the drill holes without damaging the reinforcement,
- 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.

Wedge Anchor AWA

Intended Use
Specifications of intended use

Annex B 1

Table B1: Installation parameters



Type of anchor / size			AWA M8	AWA M10	AWA M12	AWA M16
Nominal drill hole diameter	$d_0 =$	[mm]	8,0	10,0	12,0	16,0
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8,45	10,45	12,50	16,50
Effective anchorage depth	$h_{ef} \geq$	[mm]	45	60	70	85
Depth of drill hole	$h_1 \geq$	[mm]	65	80	95	115
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	9,0	12,0	14,0	18,0
Required torque moment	T_{inst}	[Nm]	15	45	80	130
Wrench size	SW	[-]	13	17	19	24

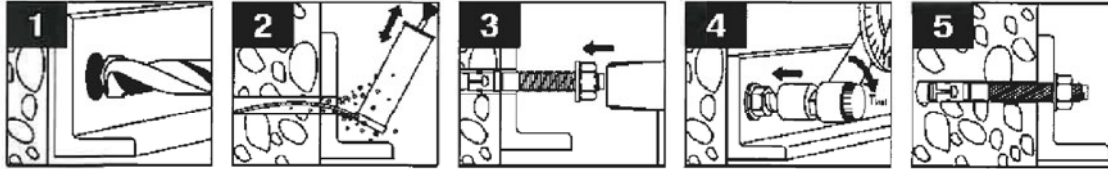
Type of anchor / size			AWA M8	AWA M10	AWA M12	AWA M16
Min. thickness of concrete member	h_{min}	[mm]	100	120	140	170
Non-cracked concrete						
Min. spacing	s_{min}	[mm]	60	75	100	115
	for $c \geq$	[mm]	100	150	165	225

Wedge Anchor AWA

Intended Use
Installation parameters

Annex B 2

Installation instruction



1. Drill hole with hammer drill
2. Clean hole of drilling dust
3. Hammer in the anchor
4. Apply the required installation torque by using a torque wrench
5. Fixed anchor after installation

Wedge Anchor AWA

Intended Use
Installation instruction

Annex B 3

Table C1: Characteristic values of resistance under tension loads in non-cracked concrete (design according to ETAG 001, Annex C, design method A)

Type of anchor / size			AWA M8	AWA M10	AWA M12	AWA M16
Installation safety factor	γ_2	[-]	1,2	1,2	1,4	1,4
Steel failure						
Characteristic resistance	$N_{Rk,s}$	[kN]	18	25	32	68
Pullout failure						
Characteristic resistance	$N_{Rk,p}$	[kN]	9	12	16	30
Increasing factor Ψ_c	C30/37	[-]	1,22			
	C40/50	[-]	1,41			
	C50/60	[-]	1,55			
Splitting failure						
Edge distance	$C_{cr,sp}$	[mm]	68	140	205	300
Axial distance	$S_{cr,sp}$	[mm]	135	280	410	600
Concrete cone failure						
Edge distance	$C_{cr,N}$	[mm]	68	90	105	128
Axial distance	$S_{cr,N}$	[mm]	135	180	210	255

Wedge Anchor AWA

Performances

Characteristic values of resistance under shear loads in non-cracked concrete
Design (ETAG 001, Annex C, design method A)

Annex C 1

Table C2: Characteristic values of resistance under shear loads in non-cracked concrete (design according to ETAG 001, Annex C, design method A)

Type of anchor / size			AWA M8	AWA M10	AWA M12	AWA M16
Installation safety factor	γ_2	[-]	1,0	1,0	1,0	1,0
Steel failure without lever arm						
Characteristic resistance	$V_{Rk,s}$	[kN]	9	13	25	34
Steel failure with lever arm						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	16	29	65	121
Concrete pryout failure						
k factor	k	[-]	1,0	2,0	2,0	2,0

Wedge Anchor AWA

Performances

Characteristic values of resistance under shear loads in non-cracked concrete
Design (ETAG 001, Annex C, design method A)

Annex C 2

Table C3: Displacement under tension load

Type of anchor / size			AWA M8	AWA M10	AWA M12	AWA M16
Effective anchorage depth	h_{ef}	[mm]	45	60	70	85
Tension load C20/25	N	[kN]	4,3	8,0	8,0	16,6
Displacements	δ_{N0}	[mm]	0,03	0,10	0,05	0,15
	$\delta_{N\infty}$	[mm]	0,86			

Table C4: Displacement under shear load

Type of anchor / size			AWA M8	AWA M10	AWA M12	AWA M16
Shear load C20/25	N	[kN]	4,9	9,1	12,5	22,2
Displacements	δ_{V0}	[mm]	1,2	2,8	1,2	2,6
	$\delta_{V\infty}$	[mm]	1,9	4,2	1,8	3,8

Wedge Anchor AWA

Performances
Displacements

Annex C 3