Deutsches Institut für Bautechnik

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

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

European Technical Assessment ETA-14/0390 of 26 April 2016

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	WAKAI WDN 6-40
Product family to which the construction product belongs	Deformation controlled expansion anchor for multiple use in concrete for non-structural applications
Manufacturer	WAKAI GmbH Mainzer Landstraße 49 60329 Frankfurt am Main DEUTSCHLAND
Manufacturing plant	Wakai
This European Technical Assessment contains	9 pages including 3 annexes
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	Guideline for European technical approval of "Metal anchors for use in concrete", ETAG 001 Part 6: "Anchors for multiple use for non-structural applications", August 2010, used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011.
This version replaces	ETA-14/0390 issued on 5 December 2014

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Specific Part

1 Technical description of the product

The Wakai WDN 6-40 is a deformation controlled anchor made of galvanised steel.

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 anchor 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 anchor 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)

The essential characteristics regarding Mechanical resistance and stability are included under the Basic Works Requirement Safety in use.

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Resistance to fire	See Annex C 1

3.3 Safety in use (BWR 4)

Essential characteristic	Performance
Characteristic resistance tension and shear loads	See Annex C 1
Displacements under tension and shear loads	See Annex C 1

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

In accordance with guideline for European technical approval ETAG 001, April 2013 used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011 the applicable European legal act is: [97/161/EC].

The system to be applied is: 2+

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 with Deutsches Institut für Bautechnik.

Issued in Berlin on 26 April 2016 by Deutsches Institut für Bautechnik

Andreas Kummerow
p. p. Head of Department

beglaubigt:
Lange

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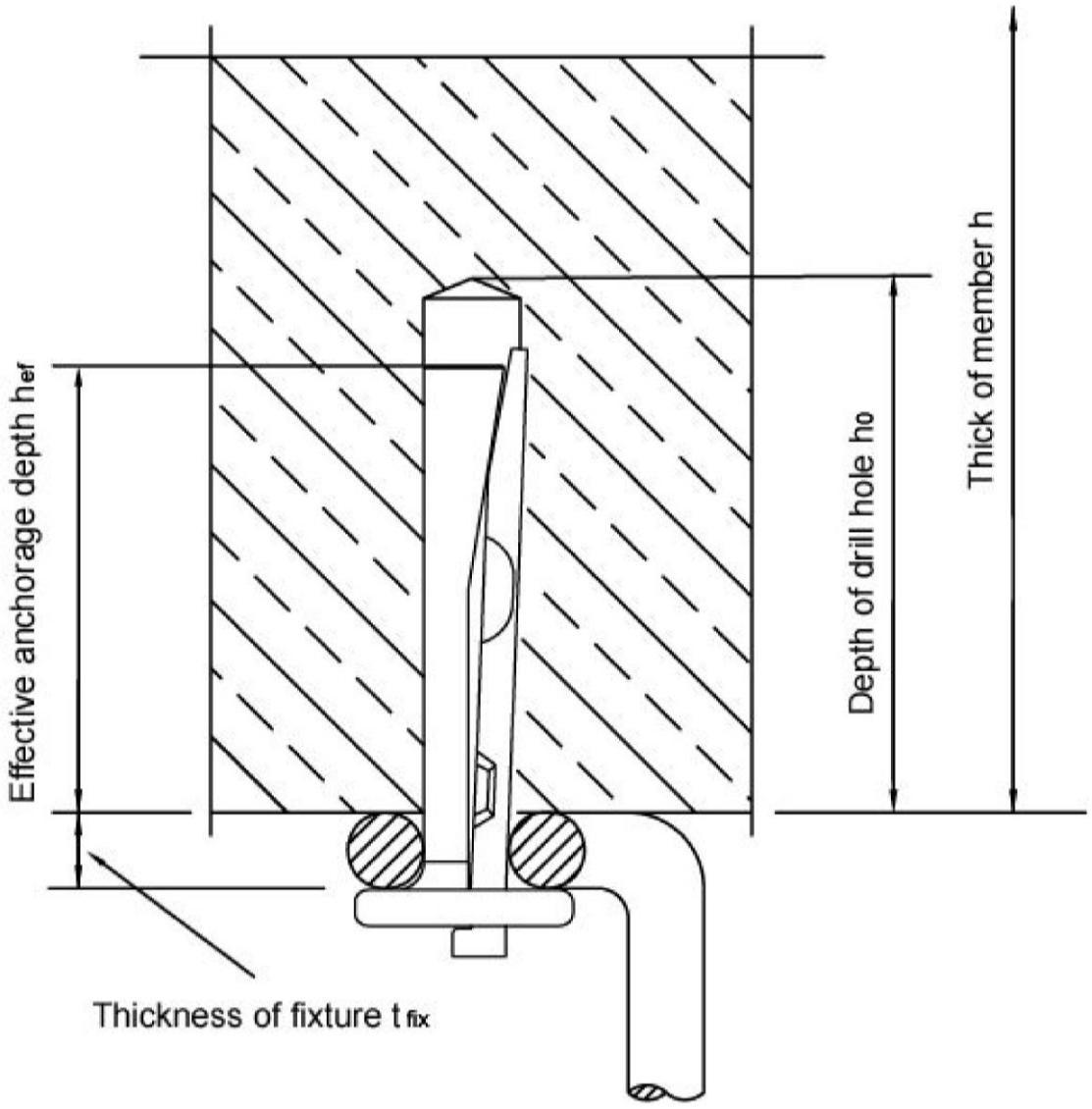
Installed anchor



WAKAI WDN 6-40	**Annex A 1**
Product description Installed condition	

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WAKAI WDN 6-40

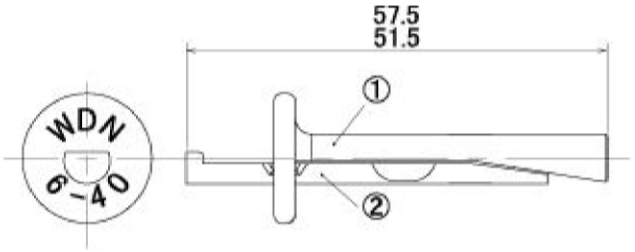

Table A1: Materials

Part	Designation	Material	tensile strength f_{uk} [N/mm²]
1	Anchor shaft	cold forming steel, ML08AL, zinc coated	394
2	Expansion pin	Galvanized steel, C1045	630

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Specifications of intended use

Anchorages subject to:

- Static and quasi-static action.

Base materials:

- Reinforced or unreinforced normal weight concrete according to EN 206:2013.
- Strength classes C20/25 to C50/60 according to EN 206:2013.

Use conditions (Environmental conditions):

- Anchorages 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 under static or quasi-static actions are designed in accordance with:
  - ETAG 001, Annex C, design method C, Edition August 2010 or
- Fasteners are only to be used for multiple use for non-structural application, according to ETAG 001 Part 6, 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.
- The anchor may only be set once

WAKAI WDN 6-40	**Annex B 1**
Intended Use Specifications	

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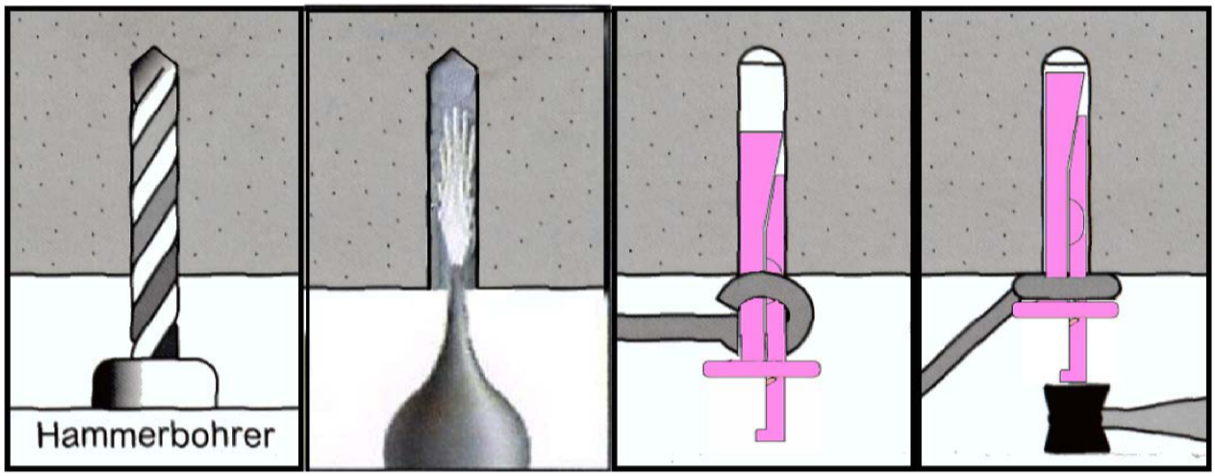
Table B1: Installation parameters

Anchor size			**6**
Nominal drill hole diameter	d_0	[mm]	6
Maximum cutting diamteter of the drill	$d_{cut} \leq$	[mm]	6,4
Depth of the drill hole to the deepest point	$h_1 \geq$	[mm]	40
Effective anchorage depth	h_{ef}	[mm]	32
Maximum thickness of fixture	$t_{fix} \leq$	[mm]	5
Minimum thickness of base material	h_{min}	[mm]	80
Minimum spacing	s_{min}	[mm]	200
Minimum edge distance	c_{min}	[mm]	150

Installation instructions



Hammer drilling only – keep installation parameters

Blow out dust and fragments

Install the anchor through the fixture into the clean drill hole

Drive-in Expansion Pin fully by impact with hammer blows

WAKAI WDN 6-40

Intended Use
Installation parameters and instructions

Annex B 2

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Table C1: Characteristic values for multiple use for non-structural applications (Design according to ETAG 001, Annex C, design method C)

Anchor size			**6**
Installation safety factor	γ_2	[-]	1.0
Characteristic spacing	s_{cr}	[mm]	200
Characteristic edge distance	c_{cr}	[mm]	150
Characteristic resistance for all load directions			
Characteristic resistance	F_{Rk}	[kN]	5,0
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	4,8

Table C2: Displacements under tension load and shear load

N [kN]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	V [kN]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]
2,38	1,64	2,46	2,85	0,98	1,47

Table C3: Characteristic values under fire exposure in concrete C20/25 to C50/60 in any load direction without lever arm, design method C

Fire resistance class	WAKAI WDN 6-40			
R30	Characteristic resistance	$F_{Rk,fi}$ [2)]	[kN]	0,9
R60	Characteristic resistance	$F_{Rk,fi}$ [2)]	[kN]	0,6
R90	Characteristic resistance	$F_{Rk,fi}$ [2)]	[kN]	0,4
R120	Characteristic resistance	$F_{Rk,fi}$ [2)]	[kN]	0,3
R30 to R120	Spacing	$s_{cr,fi}$	[mm]	200
	Edge distance [1)]	$c_{cr,fi}$	[mm]	150

[1)] In case of fire attack from more than one side, the edge distance shall be ≥ 300 mm

[2)] In absence of other national regulations the partial safety factor for resistance under fire exposure $\gamma_{M,fi}$=1.0 is recommended.