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

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European Technical Assessment

ETA-17/0176 of 30/03/2017

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	RDI ANCHOR
Product family to which the construction product belongs	Deformation-controlled expansion anchors for use in non-cracked concrete
Manufacturer	Rex Fastening Systems (HK) Ltd. Unit 2005, 20/F, Enterprise Square 3 39 Wang Chiu Road Kowloon Bay, Hong Kong
Manufacturing plant	Manufacturing Plant no. 3
This European Technical Assessment contains	11 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 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 should be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may 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

RDI ANCHOR are deformation-controlled expansion anchors. The anchors RDI ANCHOR are made of zinc plated steel.

The anchor is installed in a drilled hole and anchored by deformation-controlled expansion.

The description of the product is given in Annex A.

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

The performances given in Section 3 are only valid if the anchors are used in compliance with the specifications and conditions given in Annex B.

The performances given 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 the 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, displacements	See Annexes C1 to C3
Edge distance and spacing	See Annexes C1 to 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

3.2 Methods used for the assessment

The assessment of fitness of the anchors for the declared intended use in relation to the requirements for mechanical resistance and stability and safety in case of fire in the sense of the Basic Requirements 1 and 2 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 Decision 96/582/EC of the European 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.

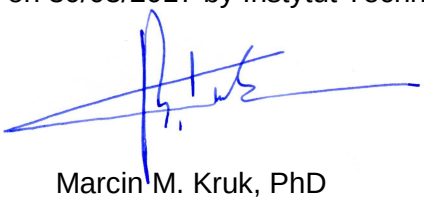
Product	Intended use	Level or class	System
Metal anchors for use in concrete	For fixing and/or supporting to concrete structural elements (which contributes to the stability of the works) or heavy units	–	1

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 which is deposited at Instytut Techniki Budowlanej.

For 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 30/03/2017 by Instytut Techniki Budowlanej



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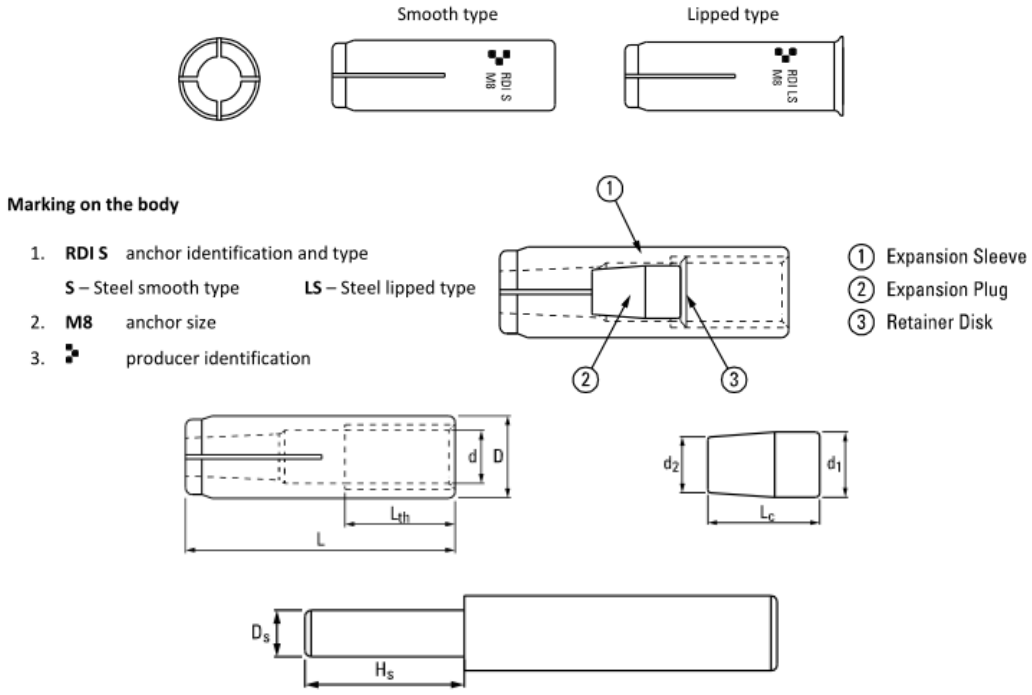


Table A1. RDI ANCHOR – dimensions and materials

Dimensions								
Anchor size			**M8**	**M10**	**M12**	**M12D**	**M16**	**M20**
Expansion sleeve								
Sleeve diameter	D	mm	10	12	15	16	20	25
Sleeve length	L	mm	30	40	50	50	65	80
Thread	d	-	M8	M10	M12	M12	M16	M20
Thread length	L_{th}	mm	13	17	21	21	30	30
Expansion plug								
Plug diameter	d_1	mm	6,5	8	10,1	10,1	13,5	17,3
Plug diameter	d_2	mm	5,5	6,5	8,5	8,5	11,4	16,3
Plug length	L_c	mm	12	15	20	20	27	30
Installation pin								
Setting pin diameter	D_s	mm	6,6	7,8	9,6	9,6	13,5	15,8
Setting pin length	H_s	mm	18	25	30	30	38	50

Materials		
Element	**Material**	**Protection**
Expansion sleeve	Q195 acc. to GB/T 700	zinc coating (≥ 5 µm); electroplated acc. to EN ISO 4042
Expansion plug	Q195 acc. to GB/T 700	

RDI ANCHOR

Product description
Characteristic of the product

Annex A1

of European Technical Assessment ETA-17/0176

SPECIFICATION OF INTENDED USE

Anchorages subject to:

- Static and quasi-static loads.

Base material:

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

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.

Installation:

- 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 specifications and drawings and using the appropriate tools.
- 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.
- Anchor installation such that the effective anchorage depth is complied with.

RDI ANCHOR	**Annex B1** of European Technical Assessment ETA-17/0176
Intended use Specification	

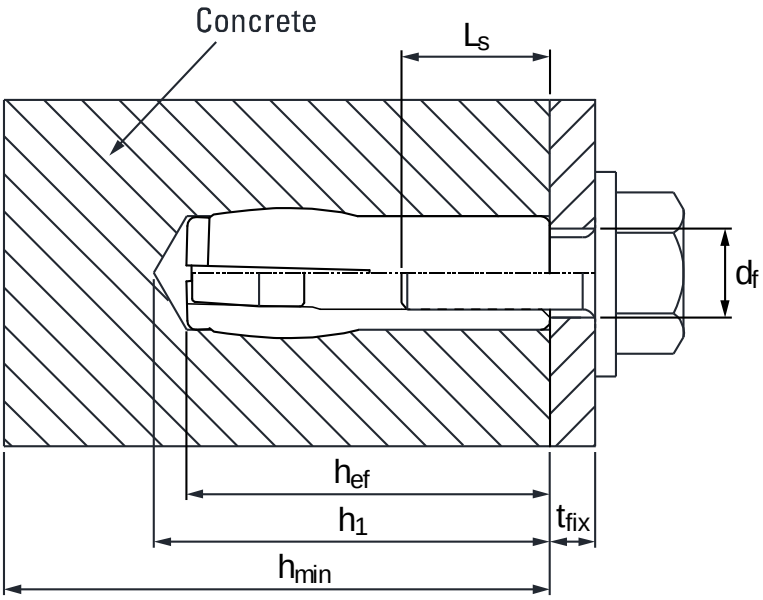


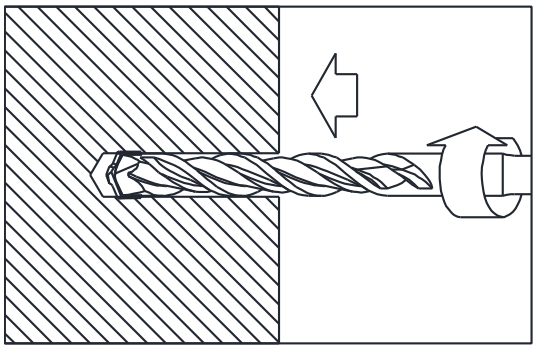
Table B1: Installation parameters

Anchor			**RDI ANCHOR**					
Size			**M8**	**M10**	**M12**	**M12D**	**M16**	**M20**
Effective anchorage depth	h_{ef}	[mm]	30	40	50	50	65	80
Drill hole depth	h_1	[mm]	33	43	54	54	70	85
Drill hole diameter	d_0	[mm]	10	12	15	16	20	25
Installation torque (max)	T_{inst}	[mm]	8	15	35	35	60	120
Thickness of concrete member (min)	h_{min}	[mm]	100	100	100	100	130	160
Screwing depth (min)	$L_{s, min}$	[mm]	8	10	12	12	16	20
Screwing depth (max)	$L_{s, max}$	[mm]	13	17	21	21	30	30
Diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	14	18	22
Spacing (min)	s_{min}	[mm]	41	54	68	68	88	108
Edge distance (min)	c_{min}	[mm]	41	54	68	68	88	108

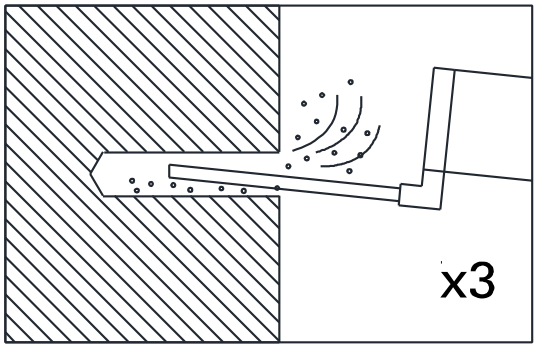
Fastening screws or anchor threaded rods:

Steel, property class 4.6 / 4.8 / 5.8 / 6.8 / 8.8 according to EN-ISO 898-1; thickness of galvanizing ≥ 5 µm

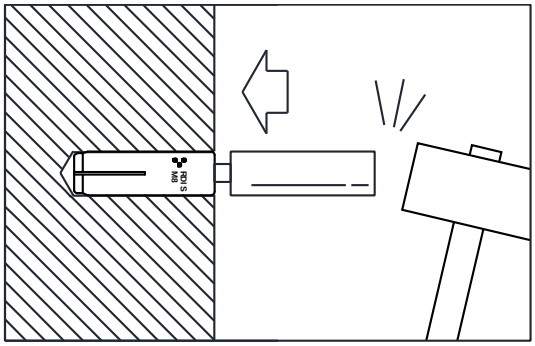
RDI ANCHOR	**Annex B2** of European Technical Assessment ETA-17/0176
Intended use Installation parameters	



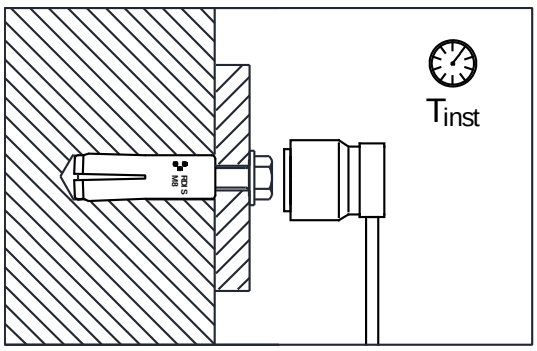
Drill hole with rotary percussive machine. Drill to a required depth.



Blow out dust at least 3 times with a hand pump.



Put the anchor into the drill hole, hammering with the installation tool, until the setting pin fully insert into the anchor.



Fix the fixture by screw or threaded rod with max. T_{inst}.

RDI ANCHOR	**Annex B3**
Intended use Installation instruction and tools	of European Technical Assessment ETA-17/0176

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

Anchor				RDI ANCHOR					
Size				**M8**	**M10**	**M12**	**M12D**	**M16**	**M20**
Steel failure									
Steel failure with threaded rod grade 4.6									
Characteristic resistance		$N_{Rk,s}$	[kN]	14,6	23,2	33,7	33,7	62,8	98,0
Partial safety factor		γ_{Ms} 2)	[-]	2,0	2,0	2,0	2,0	2,0	2,0
Steel failure with threaded rod grade 4.8									
Characteristic resistance		$N_{Rk,s}$	[kN]	14,6	23,2	33,7	33,7	62,8	98,0
Partial safety factor		γ_{Ms} 2)	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Steel failure with threaded rod grade 5.8									
Characteristic resistance		$N_{Rk,s}$	[kN]	18,3	29,0	42,2	42,2	78,5	122,5
Partial safety factor		γ_{Ms} 2)	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Steel failure with threaded rod grade 6.8									
Characteristic resistance		$N_{Rk,s}$	[kN]	22,0	34,8	50,6	50,6	94,2	147,0
Partial safety factor		γ_{Ms} 2)	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Steel failure with threaded rod grade 8.8									
Characteristic resistance		$N_{Rk,s}$	[kN]	29,3	46,4	67,4	67,4	125,6	196,0
Partial safety factor		γ_{Ms} 2)	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Pullout failure									
Characteristic resistance in non-cracked concrete C20/25		$N_{Rk,p}$	[kN]	1)	1)	1)	1)	25	30
Installation safety factor		γ_2 3) = γ_{inst} 4) 5)	[-]	1,2	1,2	1,4	1,2	1,2	1,2
Increasing factor	concrete C30/37	ψ_c	[-]	1,22	1,22	1,22	1,22	1,22	1,22
	concrete C40/50		[-]	1,41	1,41	1,41	1,41	1,41	1,41
	concrete C50/60		[-]	1,55	1,55	1,55	1,55	1,55	1,55
Concrete cone failure and splitting failure									
Effective embedment depth		h_{ef}	[mm]	30	40	50	50	65	80
Factor for non-cracked concrete		k_1 3) = k_{ucr} 4)	[-]	10,1	10,1	10,1	10,1	10,1	10,1
Factor for non-cracked concrete		$k_{ucr,N}$ 5)	[-]	11,0	11,0	11,0	11,0	11,0	11,0
Installation safety factor		γ_2 3) = γ_{inst} 4) 5)	[-]	1,2	1,2	1,4	1,2	1,2	1,2
Increasing factor	concrete C30/37	ψ_c	[-]	1,22	1,22	1,22	1,22	1,22	1,22
	concrete C40/50		[-]	1,41	1,41	1,41	1,41	1,41	1,41
	concrete C50/60		[-]	1,55	1,55	1,55	1,55	1,55	1,55
Characteristic resistance to splitting		$N^0_{Rk,sp}$	[kN]	1)	1)	1)	1)	25	30
Characteristic spacing	concrete cone failure	$s_{cr,N}$	[mm]	90	120	150	150	195	240
	splitting failure	$s_{cr,sp}$	[mm]	210	280	350	350	455	560
Characteristic edge distance	concrete cone failure	$c_{cr,N}$	[mm]	45	60	75	75	97	120
	splitting failure	$c_{cr,sp}$	[mm]	105	140	175	175	227	280

RDI ANCHOR

Annex C1

of European Technical Assessment ETA-17/0176

Performances
Characteristic resistance to tension load

Table C2: Characteristic resistance to shear load in non-cracked concrete (static and quasi-static loading)

Anchor			RDI ANCHOR					
Size			**M8**	**M10**	**M12**	**M12D**	**M16**	**M20**
Steel failure without lever arm								
Steel failure with threaded rod grade 4.6								
Characteristic resistance	$V_{Rk,s}$ [3)4)] = $V^0_{Rk,s}$ [5)]	[kN]	7,3	11,6	31,4	16,9	31,4	49,0
Factor considering ductility	k [3)] = k_2 [4)] = k_7 [5)]	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,67	1,67	1,67	1,67	1,67	1,67
Steel failure with threaded rod grade 4.8								
Characteristic resistance	$V_{Rk,s}$ [3)4)] = $V^0_{Rk,s}$ [5)]	[kN]	7,3	11,6	31,4	16,9	31,4	49,0
Factor considering ductility	k [3)] = k_2 [4)] = k_7 [5)]	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 5.8								
Characteristic resistance	$V_{Rk,s}$ [3)4)] = $V^0_{Rk,s}$ [5)]	[kN]	9,2	14,5	39,3	21,1	39,3	61,3
Factor considering ductility	k [3)] = k_2 [4)] = k_7 [5)]	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 6.8								
Characteristic resistance	$V_{Rk,s}$ [3)4)] = $V^0_{Rk,s}$ [5)]	[kN]	11,0	17,4	47,1	25,3	47,1	73,5
Factor considering ductility	k [3)] = k_2 [4)] = k_7 [5)]	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 8.8								
Characteristic resistance	$V_{Rk,s}$ [3)4)] = $V^0_{Rk,s}$ [5)]	[kN]	14,6	23,2	62,8	33,7	62,8	98,0
Factor considering ductility	k [3)] = k_2 [4)] = k_7 [5)]	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with lever arm								
Steel failure with threaded rod grade 4.6								
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	15,0	29,9	52,4	52,4	133,3	259,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,67	1,67	1,67	1,67	1,67	1,67
Steel failure with threaded rod grade 4.8								
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	15,0	29,9	52,4	52,4	133,3	259,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 5.8								
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	18,8	37,4	65,6	65,6	166,6	324,8
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 6.8								
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	22,5	44,9	78,7	78,7	199,9	389,7
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 8.8								
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	30,0	59,9	104,9	104,9	266,6	519,7
Partial safety factor	γ_{Ms} [2)]	[-]	1,25	1,25	1,25	1,25	1,25	1,25

RDI ANCHOR

Performances
Characteristic resistance to shear loads

Annex C2

of European Technical Assessment ETA-17/0176

Table C3: Characteristic resistance and displacements (static and quasi-static loading)

Anchor			**RDI ANCHOR**					
Size			**M8**	**M10**	**M12**	**M12D**	**M16**	**M20**
Resistance to pry-out failure								
Factor for non-cracked concrete	$k^{3)} = k_3{}^{4)} = k_8{}^{5)}$	[-]	1,0	1,0	1,0	1,0	2,0	2,0
Partial safety factor	$\gamma_{Ms}{}^{2)}$	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Resistance to concrete edge failure								
Outside diameter of anchor	d_{nom}	[mm]	10	12	15	16	20	25
Effective length of anchor under shear loads	l_f	[mm]	30	40	50	50	65	80
Partial safety factor	$\gamma_{Mc}{}^{2)}$	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Minimum member thickness	h_{min}	[mm]	100	100	100	100	130	160
Minimum edge distance	c_{min}	[mm]	41	54	68	68	88	108
Minimum spacing	s_{min}	[mm]	41	54	68	68	88	108
Displacements under static and quasi-static loading								
Tension and shear load in non-cracked concrete C20/25 to C50/60								
Tension load and shear load	N = V	[kN]	4,44	6,91	6,40	9,92	11,46	23,86
Short term tension displacement	δ_{N0}	[mm]	0,98	3,54	3,06	2,73	1,15	4,26
Long term tension displacement	$\delta_{N\infty}$	[mm]	0,50	0,50	0,38	0,50	0,50	0,50
Short term shear displacement	δ_{V0}	[mm]	0,98	3,54	3,06	2,73	1,15	4,26
Long term shear displacement	$\delta_{V\infty}$	[mm]	0,50	0,50	0,38	0,50	0,50	0,50

1) Pull-out failure mode is not decisive
2) 3) Parameter for design acc. to ETAG 001 Annex C
4) Parameter for design acc. to CEN/TS 1992-4-4:2009
5) Parameter for design acc. to prEN 1992-4:2016

RDI ANCHOR	**Annex C3** of European Technical Assessment ETA-17/0176
Performances Characteristic resistance and displacements	

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European Technical Assessment

ETA-17/0177 of 30/03/2017

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	RDI ANCHOR
Product family to which the construction product belongs	Deformation-controlled expansion anchors for multiple use for non-structural applications in concrete
Manufacturer	Rex Fastening Systems (HK) Ltd. Unit 2005, 20/F, Enterprise Square 3 39 Wang Chiu Road Kowloon Bay, Hong Kong
Manufacturing plant(s)	Manufacturing Plant no. 3
This European Technical Assessment contains	10 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 ETAG 001, Edition April 2013 “Metal anchors for use in concrete – Part 1: Anchors in general and Part 6: Anchors for multiple use for non-structural applications”, used as European Assessment Document (EAD)

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 should be identified as such.

Specific Part

1 Technical description of the product

The RDI ANCHOR are deformation-controlled expansion anchors. The anchors are made of zinc plated steel.

The anchor is installed in a drilled hole and anchored by deformation-controlled expansion.

The description of the product is given in Annex A.

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

The performances given in Section 3 are only valid if the anchors are used in compliance with the specifications and conditions given in Annex B.

The performances given 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 the 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 all load directions	See Annex C1
Edge distances and spacing	See Annex C1

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	See Annex C2

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 (BWR 1).

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 anchors for the 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 made in accordance with the ETAG 001 *"Metal anchors for use in concrete*", Part 1: "*Anchors in general*" and Part 6: "*Anchors for multiple use for non-structural applications*".

The assessment of the anchor for the intended use in relation to the requirements for resistance to fire has been made in accordance with the EOTA Technical Report TR 020 "*Evaluation of anchorages in concrete concerning resistance to fire*".

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

According to Decision 97/161/EC of the European 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 (light-duty type)	For use in redundant systems for fixing and/or supporting to concrete elements such as lightweight suspended ceilings, as well as installations	–	2+

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 which is deposited at Instytut Techniki Budowlanej.

For 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.

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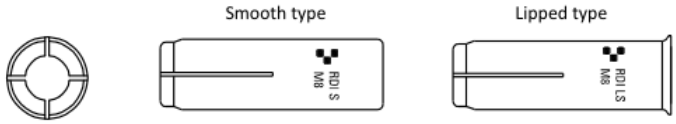
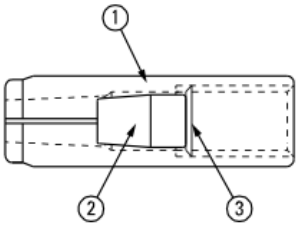
Marcin M. Kruk, PhD
Director of ITB

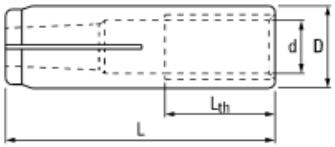


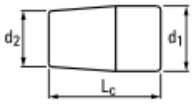
Marking on the body

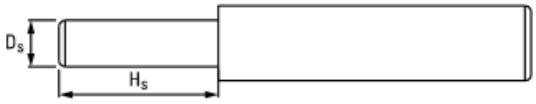
1. **RDI S** anchor identification and type
   S – Steel smooth type **LS** – Steel lipped type
2. **M8** anchor size
3. producer identification



1. Expansion Sleeve
2. Expansion Plug
3. Retainer Disk







Dimensions								
Anchor size			**M6**	**M8**	**M10H**	**M10**	**M12**	**M12D**
Expansion sleeve								
Sleeve diameter	D	[mm]	8	10	12	12	15	16
Sleeve length	L	[mm]	25	30	30	40	50	50
Thread	d	[-]	M6	M8	M10	M10	M12	M12
Thread length	L_{th}	[mm]	11	13	12	17	21	21
Expansion plug								
Plug diameter	d_1	[mm]	5,0	6,5	8,0	8,0	10,1	10,1
Plug diameter	d_2	[mm]	4,0	5,5	6,9	6,5	8,5	8,5
Plug length	L_c	[mm]	10	12	11	15	20	20
Installation pin								
Setting pin diameter	D_s	[mm]	4,8	6,6	7,8	7,8	9,6	9,6
Setting pin length	H_s	[mm]	15	18	18	25	30	30

Materials		
Element	**Material**	**Protection**
Expansion sleeve	Q195 acc. to GB/T 700	zinc coating (≥ 5 µm); electroplated acc. to EN ISO 4042
Expansion plug	Q195 acc. to GB/T 700	

RDI ANCHOR

Product description
Characteristic of the product

Annex A1

of European Technical Assessment ETA-17/0177

SPECIFICATION OF INTENDED USE

Anchorages subject to:

- Multiple use for non-structural applications. The definition of multiple use according to the Member States is given on the informative Annex 1 of ETAG 001, Part 6.
- Static and quasi-static loads.
- Anchorages with requirements related to resistance to fire.

Base material:

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

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 ETAG 001, Annex C, design method B, Edition August 2010.
- The design of anchorages under fire exposure has to consider the conditions given in the EOTA Technical Report TR 020.

Installation:

- 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 specifications and drawings and using the appropriate tools.
- 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.
- Anchor installation such that the effective anchorage depth is complied with.

RDI ANCHOR	**Annex B1** of European Technical Assessment ETA-17/0177
Intended use Specification	

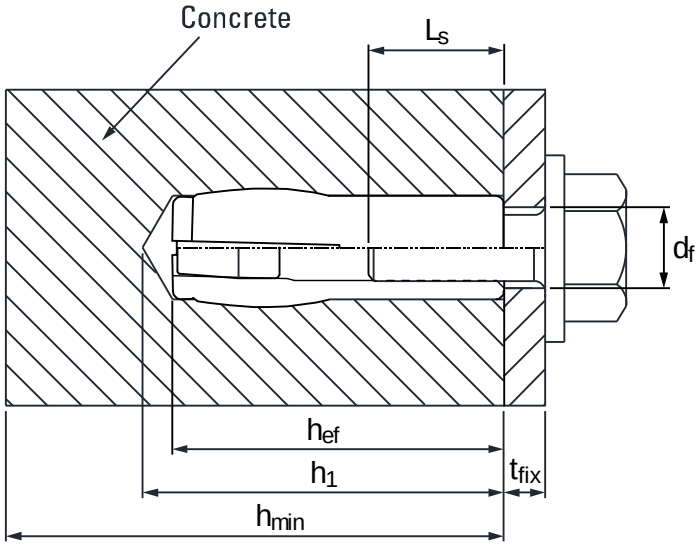


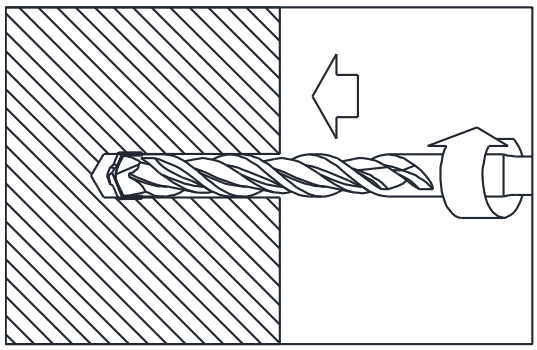
Table B1: Installation parameters

Anchor			**RDI ANCHOR**					
Size			**M6**	**M8**	**M10H**	**M10**	**M12**	**M12D**
Effective anchorage depth	h_{ef}	[mm]	25	30	30	40	50	50
Drill hole depth	h_1	[mm]	28	33	33	43	54	54
Drill hole diameter	d_0	[mm]	8	10	12	12	15	16
Installation torque (max)	T_{inst}	[mm]	4	8	15	15	35	35
Thickness of concrete member (min)	h_{min}	[mm]	80	80	80	80	100	100
Screwing depth (min)	$L_{s,\,min}$	[mm]	6	8	8	10	12	12
Screwing depth (max)	$L_{s,\,max}$	[mm]	11	13	12	17	21	21
Diameter of clearance hole in the fixture	d_f	[mm]	7	9	12	12	14	14
Spacing (min)	s_{min}	[mm]	200	200	200	200	200	200
Edge distance (min)	c_{min}	[mm]	150	150	150	150	150	150

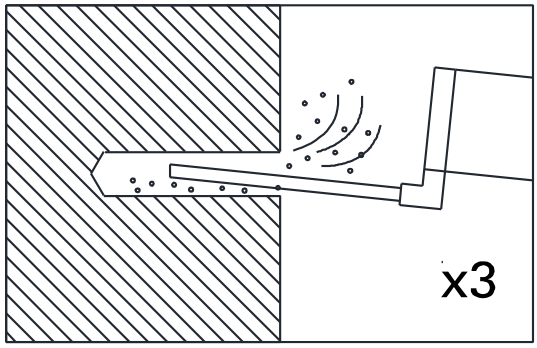
Fastening screws or anchor threaded rods:

Steel, property class 4.6 / 4.8 / 5.8 / 6.8 / 8.8 according to EN-ISO 898-1; thickness of galvanizing ≥ 5 µm

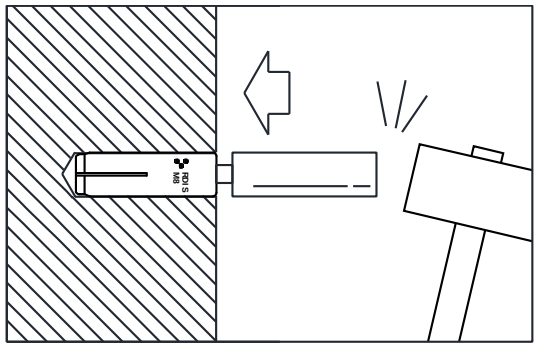
RDI ANCHOR	**Annex B2** of European Technical Assessment ETA-17/0177
Intended use Installation parameters	



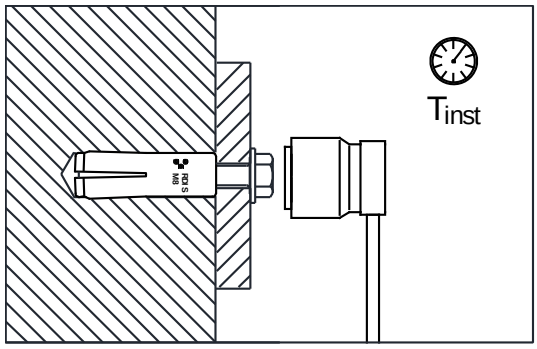
Drill hole with rotary percussive machine. Drill to a required depth.



Blow out dust at least 3 times with a hand pump.



Put the anchor into the drill hole, hammering with the installation tool, until the setting pin fully insert into the anchor.



Fix the fixture by screw or threaded rod with max. T_{inst}

RDI ANCHOR	**Annex B3**
Intended use Installation instruction and tools	of European Technical Assessment ETA-17/0177

Table C1: Characteristic resistance in concrete C20/25 to C50/60 (design acc. to ETAG 001, Annex C, method B)

Anchor			**RDI ANCHOR**					
Size			**M6**	**M8**	**M10H**	**M10**	**M12**	**M12D**
All load directions (fastening screw or threaded rod property class ≥ 4.6)								
Characteristic resistance in concrete C20/25 to C50/60	F_{Rk}	[kN]	1,5	2,0	3,0	3,0	4,0	5,0
Partial (installation) safety factor	γ_2	[-]	1,4	1,4	1,4	1,4	1,4	1,4
Spacing	s_{cr}	[mm]	200	200	200	200	200	200
Edge distance	c_{cr}	[mm]	150	150	150	150	150	150
Minimum member thickness	h_{min}	[mm]	80	80	80	80	100	100
Shear load: steel failure with lever arm								
Characteristic bending moment: screw class 4.6	$M^0_{Rk,S}$	[Nm]	6,1	15,0	29,9	29,9	52,4	52,4
Characteristic bending moment: screw class 4.8	$M^0_{Rk,S}$	[Nm]	6,1	15,0	29,9	29,9	52,4	52,4
Characteristic bending moment: screw class 5.8	$M^0_{Rk,S}$	[Nm]	7,6	18,8	37,4	37,4	65,6	65,6
Characteristic bending moment: screw class 6.8	$M^0_{Rk,S}$	[Nm]	9,2	22,5	44,9	44,9	78,7	78,7
Characteristic bending moment: screw class 8.8	$M^0_{Rk,S}$	[Nm]	12,2	30,0	59,9	59,9	104,9	104,9

Table C2: Characteristic resistance under fire exposure in concrete C20/25 to C50/60 (design acc. to ETAG 001, Annex C, method B)

Anchor			**RDI ANCHOR**					
Size			**M6**	**M8**	**M10H**	**M10**	**M12**	**M12D**
Fire resistance class (fastening screw or threaded rod property class ≥ 4.6)								
R30	Characteristic resistance $F_{Rk,fi}$ [1)]	[kN]	0,2	0,5	0,8	0,8	1,0	1,3
R60		[kN]	0,2	0,5	0,8	0,8	1,0	1,3
R90		[kN]	0,1	0,4	0,8	0,8	1,0	1,1
R120		[kN]	0,1	0,3	0,6	0,6	0,8	0,8
Spacing	$s_{cr,fi}$	[mm]	$4 \times h_{ef}$					
Edge distance	$c_{cr,fi}$	[mm]	$2 \times h_{ef}$					

The design method covers anchors with a fire attack from one side only. In case of fire attack from more than one side, the edge distance shall be ≥ 300 mm.

[1)] in the absence of other national regulations a partial safety factor $\gamma_{m,fi} = 1,0$ is recommended

RDI ANCHOR	**Annex C2** of European Technical Assessment ETA-17/0177
Performances Characteristic resistance under fire exposure	

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European Technical Assessment

ETA-17/0325 of 10/04/2017

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	CMH ANCHOR
Product family to which the construction product belongs	Deformation-controlled expansion anchor made of galvanized steel for multiple use for non-structural applications in concrete
Manufacturer	Construction Anchors Co., Ltd. 9F, No. 21, Sec. 3, Xinsheng S.Rd., Da'an Dist, Taipei City 106 Taiwan R.O.C.Hong Kong
Manufacturing plant	Manufacturing Plant no. 4
This European Technical Assessment contains	9 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 ETAG 001, Edition April 2013 "Metal anchors for use in concrete – Part 1: Anchors in general and Part 6: Anchors for multiple use for non-structural applications", used as European Assessment Document (EAD)

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Specific Part

1 Technical description of the product

CMH ANCHOR of size Ø6 is deformation-controlled expansion anchor. CMH ANCHOR is made of galvanized steel. The anchor is installed in a drilled hole and anchored by deformation-controlled expansion.

An illustration of the product is given in Annex A1.

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

The performances given in Section 3 are only valid if the anchors are used in compliance with the specifications and conditions given in Annex B1 and B2.

The performances given 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 the 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 all load directions	See Annex C1
Edge distances and spacing	See Annex C1

3.1.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchors satisfy requirements for Class A1
Characteristic resistance under fire exposure	See Annex C2

3.1.3 Hygiene, health and the environment (BWR 3)

Regarding the dangerous substances 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 (BWR 1).

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 anchors 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 made in accordance with the ETAG 001 *"Metal anchors for use in concrete*", Part 1: "*Anchors in general*" and Part 6: "*Anchors for multiple use for non-structural applications*".

The assessment of the anchor for the intended use in relation to the requirements for resistance to fire has been made in accordance with the EOTA Technical Report TR 020 "*Evaluation of anchorages in concrete concerning resistance to fire*".

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

According to Decision 97/161/EC of the European 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 (light-duty type)	For use in redundant systems for fixing and/or supporting to concrete elements such as lightweight suspended ceilings, as well as installations	–	2+

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 which is deposited at Instytut Techniki Budowlanej.

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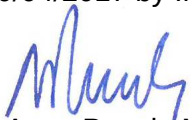
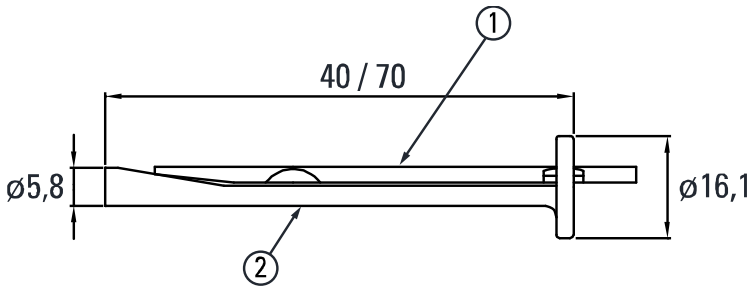
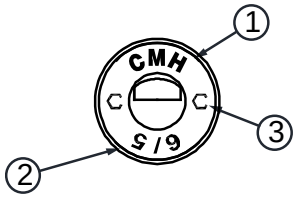


Anna Panek, MSc
Deputy Director of ITB



① Wedge
② Body



Marking on the body

1. **CMH** anchor identification
2. **6/5** anchor size / maximum fixture thickness
3. C producer identification

Table A1. CMH ANCHOR – dimensions and materials

CMH ANCHOR		**CMH 6/5**	**CMH 6/35**
Anchor nominal size		6	
Length of wedge	mm	43	73
Length of shank	mm	40	70
Diameter	mm	5,8	
Materials	wedge	steel 45 (GB/T 699) / C45 / 1.0503 acc. to EN 10277-2 (tensile strength f_{uk} = 600 N/mm^2) zinc coated	
	shank	steel ML08Al (GB/T 6478) / C8C / 1.0213 acc. to EN 10263-2 (tensile strength f_{uk} = 420 N/mm^2) zinc coated	

CMH ANCHOR	**Annex A1** of European Technical Assessment ETA-17/0325
Product description Characteristic of the product	

SPECIFICATION OF INTENDED USE

Anchorages subject to:

- Multiple use for non-structural applications.
- Static and quasi-static loads.
- Anchorages with requirements related to resistance to fire.

Base material:

- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum to C50/60 at maximum according to EN 206.
- Cracked and non-cracked concrete.

Use conditions (environmental conditions):

- 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 ETAG 001, Annex C, design method C, Edition August 2010.
- The design of anchorages under fire exposure has to consider the conditions given in the EOTA Technical Report TR 020.
- Fasteners are only to be used for multiple use for non-structural applications acc. 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.
- Anchor installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools.
- Edge distance and spacing not less than the specified values without minus tolerances.
- 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 the direction of load application.
- 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.
- Anchor can only be set once.

CMH ANCHOR	**Annex B1** of European Technical Assessment ETA-17/0325
Intended use Intended use	

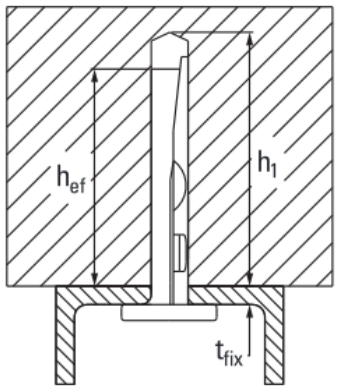
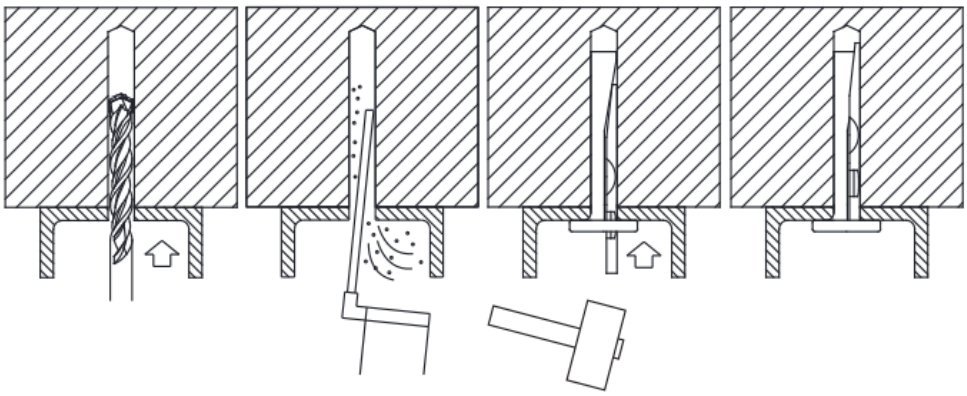


Table B1: Installation parameters

CMH ANCHOR			**CMH 6/5**	**CMH 6/35**
Diameter of drill hole	d_0	mm	6	
Cutting diameter of drill bit	d_{cut}	mm	≤ 6,4	
Depth of drill hole	$h_1 \geq$	mm	40	
Effective anchorage depth	h_{ef}	mm	32	
Minimum thickness of concrete member	h_{min}	mm	80	
Maximum thickness of the fixture	t_{fix}	mm	5	35
Spacing	s_{cr}	mm	200	
Edge distance	c_{cr}	mm	150	



CMH ANCHOR	**Annex B2** of European Technical Assessment ETA-17/0325
Intended use Installation parameters and installation instruction	

Table C1: Characteristic resistance (design acc. to ETAG 001, Annex C, method C)

CMH ANCHOR			**CMH-6/5 CMH-6/35**	
All load directions (tension and shear)				
Characteristic resistance in cracked or non-cracked concrete C20/25 to C50/60	F_{Rk}	kN	**4,0**	
Partial safety factor	γ_2	-	1,0	
Shear load with lever arm				
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	**6,97**	
Partial safety factor	γ_M	[-]	1,25	
Displacements in cracked or non-cracked concrete C20/25 to C50/60			**Tension**	**Shear**
Applied loads	F	[kN]	1,90	1,79
Displacements	δ_{N0}	[mm]	1,85	0,22
	$\delta_{N\infty}$	[mm]	0,13	0,32

Table C2: Characteristic resistance under fire exposure in concrete C20/25 to C50/60 – CMH ANCHOR (design acc. to ETAG 001, Annex C, method C)

CMH ANCHOR			**CMH-6/5 CMH-6/35**			
All load directions						
Fire resistance class			**R30**	**R60**	**R90**	**R120**
Characteristic resistance	$F_{Rk,fi}$	[kN]	0,21	0,19	0,14	0,10
Spacing	$s_{cr,fi}$	[mm]	200			
Edge distance	$c_{cr,fi}$	[mm]	150			
The design method covers anchors with a fire attack from one side only. In case of fire attack from more than one side, the edge distance shall be ≥ 300 mm.						