

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-15/0208
of 19 January 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

Carbon Fix

Product family
to which the construction product belongs

nailed-in plastic anchor for fixing of external thermal
insulation composite systems with rendering in concrete
and masonry

Manufacturer

DAW SE
Roßdörfer Straße 50
64372 Ober-Ramstadt
DEUTSCHLAND

Manufacturing plant

DAW Herstellwerk 10183
DAW manufacturing plant 10183

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 "Plastic
anchors for fixing of external thermal insulation composite
systems with rendering", ETAG 014, edition
February 2011,
used as European Assessment Document (EAD)
according to Article 66 Paragraph 3 of Regulation (EU)
No 305/2011.

This version replaces

ETA-15/0208 issued on 28 April 2015

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Specific Part

1 Technical description of the product

The nailed-in anchor Carbon Fix consists of an anchor sleeve with an enlarged shaft, spreading zone subsequently, an insulation plate made of polyethylene and an accompanying specific nail of galvanised steel with an overmoulding of polyamide. The serrated expanding part of the anchor sleeve is slotted.

The anchor may in addition be combined with the anchor plates SBL 140 plus and VT 90.

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

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 25 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 Hygiene, health and the environment (BWR 3)

Regarding dangerous substances there may be requirements (e.g. transposed European legislation and national laws, regulations and administrative provisions) applicable to the products falling within the scope of this European Technical Assessment. In order to meet the provisions of Regulation (EU) No 305/2011, these requirements need also to be complied with, when and where they apply.

3.3 Safety in use (BWR 4)

| Essential characteristic | Performance |
|-----------------------------------|---------------|
| Characteristic tension resistance | See Annex C 1 |
| Edge distances and spacing | See Annex B 2 |
| Point thermal transmittance | See Annex C 2 |
| Plate stiffness | See Annex C 2 |
| Displacements | See Annex C 2 |

English translation prepared by DIBt

3.4 Sustainable use of natural resources (BWR 7)

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

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 014, February 2011 used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011 the applicable European legal act is: 97/463/EC.

The system to be applied is: 2+

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

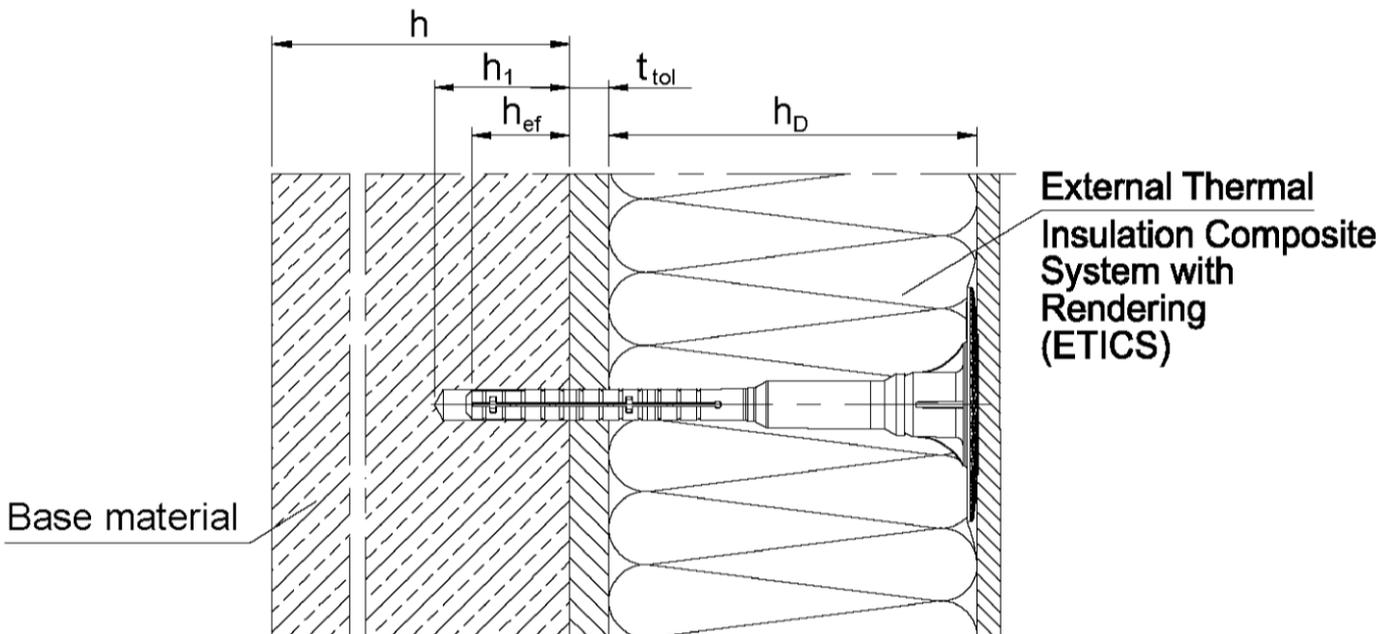
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 19 January 2016 by Deutsches Institut für Bautechnik

Uwe Bender
Head of Department

beglaubigt:
Ziegler

Carbon Fix



Intended use

- Anchorage of ETICS in concrete and masonry
- Anchorage of ETICS in autoclaved aerated concrete

Legend: h_D = thickness of insulation material
 h_{ef} = effective anchorage depth
 h = thickness of member (wall)
 h_1 = depth of drill hole to deepest point
 t_{tol} = thickness of equalizing layer or non-load-bearing coating

Carbon Fix

Product description
Intended use

Annex A 1

Carbon Fix in use category A, B, C

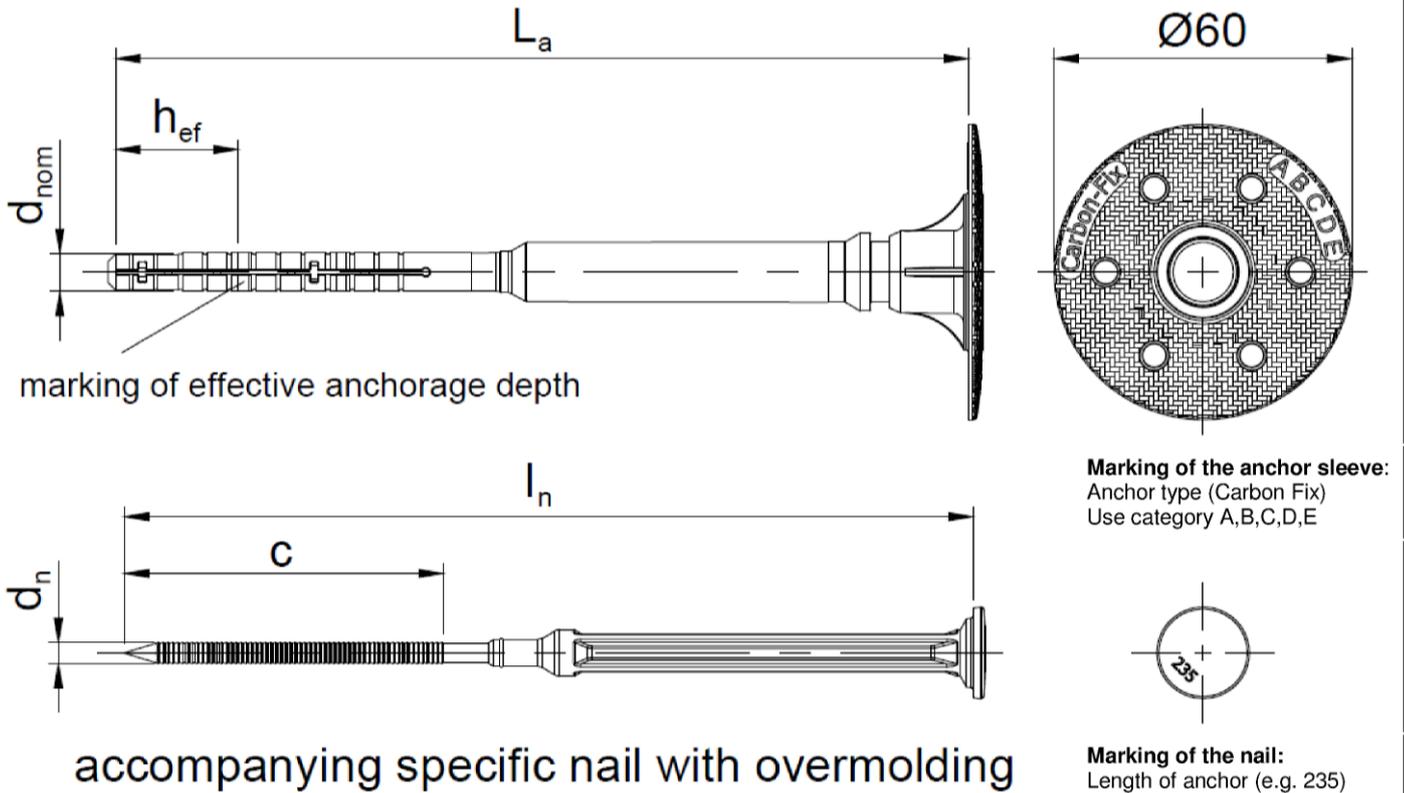


Table A1: Dimensions

| Anchor Type | Colour | Anchor sleeve | | | Specific nail | | |
|-------------|----------------------|---------------|----------|------------------------|---------------|------|------------------------|
| | | d_{nom} | h_{ef} | min L_a max L_a | d_n | c | min l_n max l_n |
| | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| Carbon Fix | anthracite / grey | 8 | 25 | 95 295 | 4,13 | 60 | 95 295 |

Determination of maximum thickness of insulation h_D [mm] for Carbon Fix:

$$h_D = L_a - t_{tol} - h_{ef} \quad (L_a = \text{e.g. } 155; t_{tol} = 10)$$

e.g. $h_D = 155 - 10 - 25$

$$h_{Dmax} = 120$$

Carbon Fix

Product description

Marking and dimension of the anchor sleeve, use category A, B, C
expansion element

Annex A 2

Carbon Fix in use category D and E

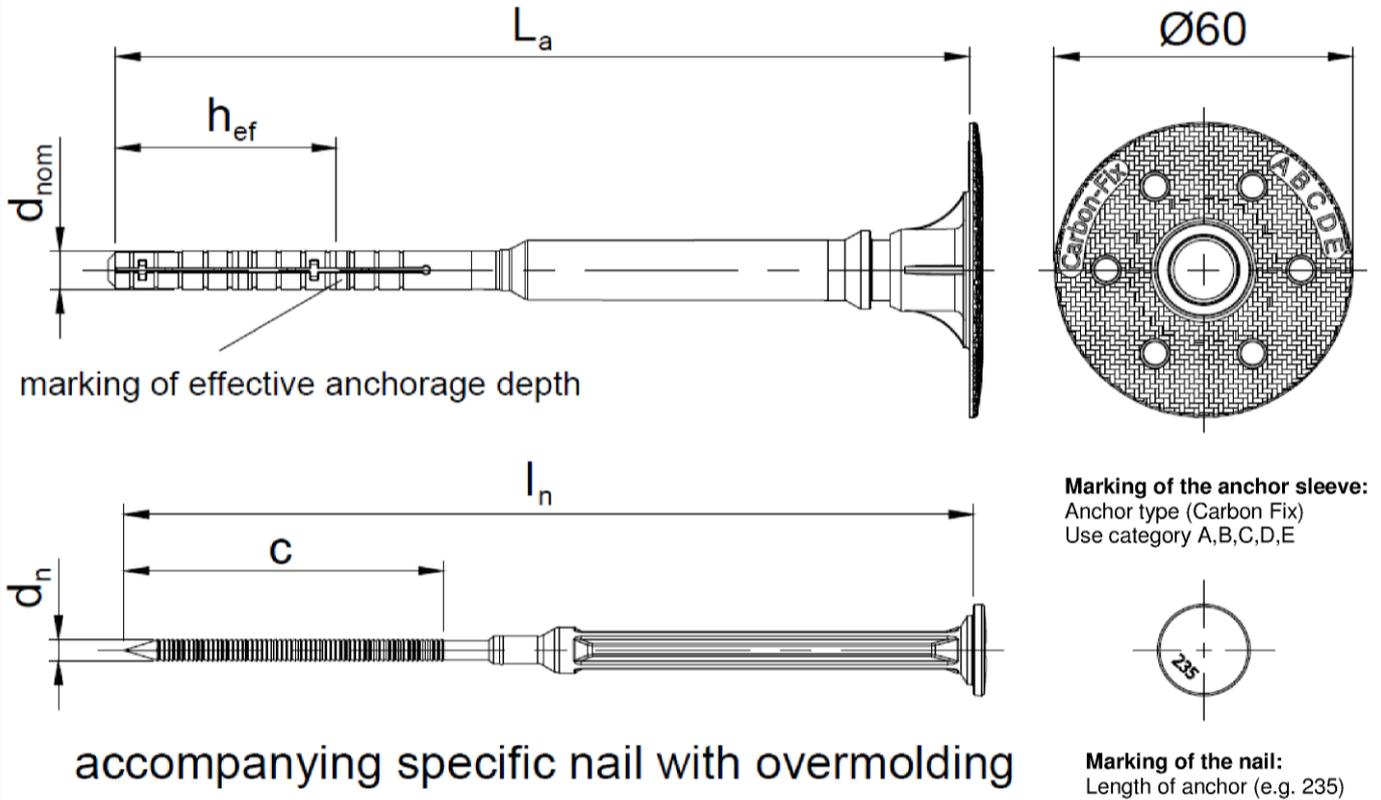


Table A2: Dimensions

| Anchor Type | Colour | Anchor sleeve | | | Specific nail | | |
|-------------|-------------------|---------------|----------|------------------------|---------------|------|------------------------|
| | | d_{nom} | h_{ef} | min L_a max L_a | d_n | c | min l_n max l_n |
| | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| Carbon Fix | anthracite / grey | 8 | 45 | 95 295 | 4,13 | 60 | 95 295 |

Determination of maximum thickness of insulation h_D [mm] for Carbon Fix:

$$h_D = L_a - t_{tol} - h_{ef} \quad (L_a = \text{e.g. } 155; t_{tol} = 10)$$

e.g. $h_D = 155 - 10 - 45$

$$h_{Dmax} = 100$$

Carbon Fix

Product description

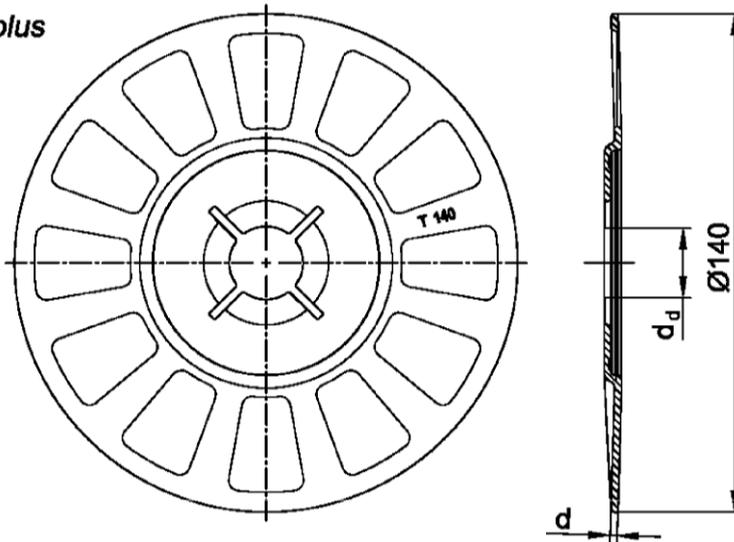
Marking and dimension of the anchor sleeve, use category D and E expansion element

Annex A 3

Table A3: Materials

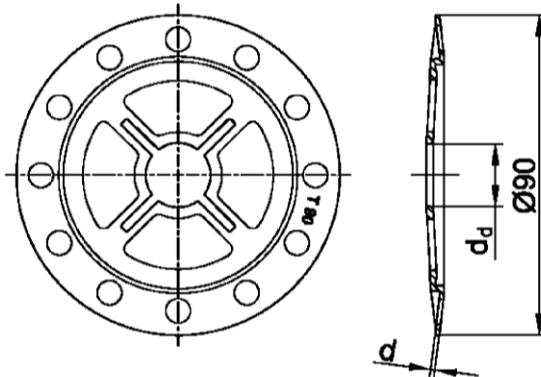
| Name | Materials |
|------------------------------|--|
| Anchor sleeve + Anchor plate | Polyethylene, PE-HD, colour: anthracite / grey |
| Specific nail - overmoulding | Polyamide, PA GF 50 |
| Specific nail | Steel, electro galvanized $\geq 5 \mu\text{m}$ according to EN ISO 4042:2001, blue passivated $f_{yk} \geq 670 \text{ N/mm}^2$ |

SBL 140 plus



| SBL 140 plus | |
|--------------|------------------|
| colour | nature |
| d_d [mm] | 20,0 |
| d [mm] | 2,0 |
| Material | ^{1) 2)} |

VT 90



| VT 90 | |
|------------|------------------|
| colour | nature |
| d_d [mm] | 17,5 |
| d [mm] | 1,2 |
| Material | ^{1) 2)} |

- ¹⁾ Polyamide, PA 6
²⁾ Polyamide, PA GF 50

Carbon Fix

Product description

Materials,
Slip on plates with Carbon Fix

Annex A 4

Specifications of intended use

Anchorage subject to:

- The anchor may only be used for transmission of wind suction loads and shall not be used for the transmission of dead loads of the thermal insulation composite system.

Base materials:

- Normal weight concrete (use category A) according to Annex C 1.
- Solid masonry (use category B), according to Annex C 1.
- Hollow or perforated masonry (use category C), according to Annex C 1.
- Lightweight aggregate concrete (use category D), according to Annex C 1.
- Autoclaved aerated concrete (use category E), according to Annex C 1.
- For other base materials of the use categories A, B, C, D or E the characteristic resistance of the anchor may be determined by job site tests according to ETAG 014 Edition February 2011, Annex D.

Temperature Range:

- 0°C to +40°C (max. short term temperature +40°C and max. long term temperature +24°C)

Design:

- The anchorages are designed in accordance with the ETAG 014 Edition February 2011 under the responsibility of an engineer experienced in anchorages and masonry 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.
- Fasteners are only to be used for multiple fixings of thermal insulation composite systems.

Installation:

- Hole drilling by the drill modes according to Annex C 1.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Installation temperature from 0°C to +40°C
- Exposure to UV due to solar radiation of the anchor not protected by rendering ≤ 6 weeks

Carbon Fix

**Intended use
Specifications**

Annex B 1

Table B1: Installation parameters

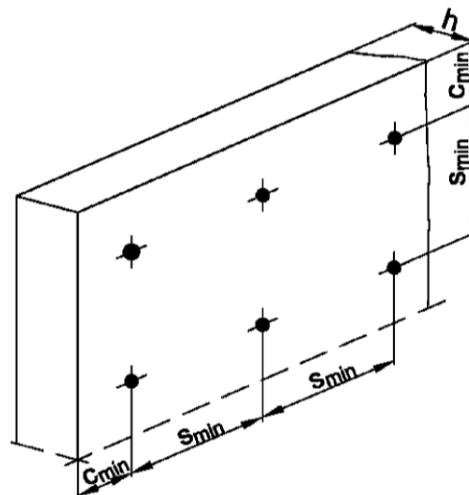
| Anchor type | | Carbon Fix | |
|---|------------------|--------------|---------|
| | | use category | |
| | | A, B, C | D and E |
| Drill hole diameter | d_0 [mm] = | 8 | 8 |
| Cutting diameter of drill bit | d_{cut} [mm] ≤ | 8,45 | 8,45 |
| Depth of drill hole to deepest point | h_1 [mm] ≥ | 35 | 55 |
| Effective anchorage depth ¹⁾ | h_{ef} [mm] ≥ | 25 | 45 |

¹⁾ Larger anchoring depths are fundamentally possible.

Table B2: Anchor distances and dimensions of members

| Anchor type | | Carbon Fix | |
|--|---------------------|------------|--|
| Minimum allowable spacing | $s_{min} \geq$ [mm] | 100 | |
| Minimum allowable edge distance | $c_{min} \geq$ [mm] | 100 | |
| Minimum thickness of member | $h \geq$ [mm] | 100 | |
| Minimum thickness of thin concrete members | $h \geq$ [mm] | 40 | |

Scheme of distance and spacing



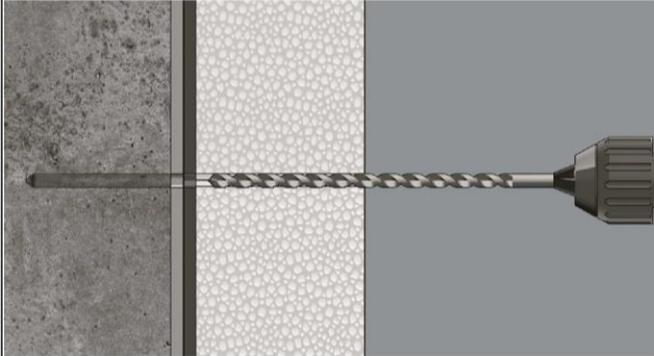
Carbon Fix

Intended use

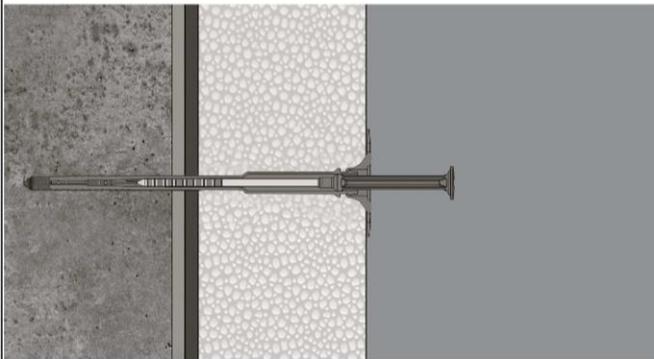
Installation parameters,
Minimum thickness of member, edge distances and spacing

Annex B 2

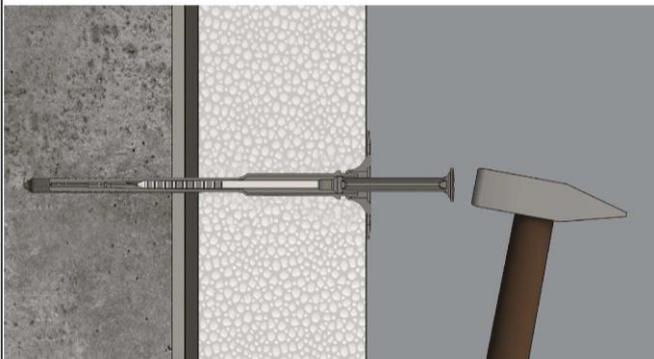
Installation instructions



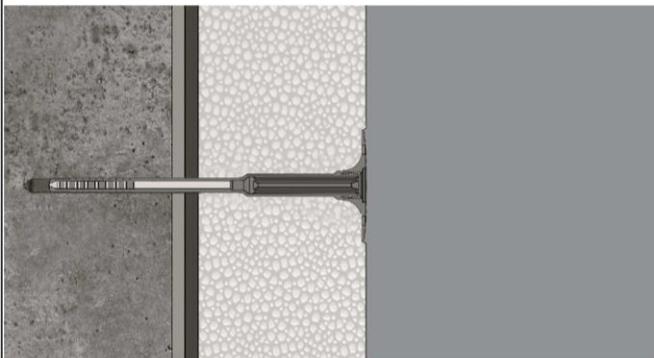
Drill the hole perpendicular to the substrate surface.
Clean the drill hole 3x.



Place the anchor into the drill hole.
The bottom side of the plate must be flush with the ETICS.



Drive in the specific nail with the hammer.



Installed condition Carbon Fix

electronic copy of the eta by dibt: eta-15/0208

Carbon Fix

Intended use
Installation instructions

Annex B 3

| Table C1: Characteristic resistance to tension loads N_{Rk} in concrete an masonry for a single anchor in kN | | | | | |
|--|---|---|---|--------------|----------------------|
| Anchor type | | | | | Carbon Fix |
| Base materials | Bulk density class ρ [kg/dm ³] | minimum compressive strength f_b [N/mm ²] | General remarks | Drill method | N_{Rk} [kN] |
| Concrete C16/20– C50/60 EN 206-1:2000 | | | | hammer | 0,9 |
| Thin concrete members (e.g. weather resistant skin) Concrete C12/15– C50/60 EN 206-1:2000 | | | Thickness of the thin skin: 100 mm > h ≥ 40 mm | hammer | 0,9 |
| Clay bricks, Mz e.g. according to DIN 105-100:2012-01 / EN 771-1:2011 | ≥ 1,8 | 12 | Vertically perforation up to 15 %. | hammer | 0,9 |
| Sand-lime solid bricks, KS e.g. according to DIN V 106:2005-10 / EN 771-2:2011 | ≥ 1,8 | 12 | Vertically perforation up to 15 %. | hammer | 0,9 |
| Vertically perforated clay bricks, HLz e.g. according to DIN 105-100:2012-01 / EN 771-1:2011 | ≥ 0,8 | 12 | Vertically perforation ≥ 15 % and ≤ 50 %. | rotary | 0,6 ¹⁾ |
| Sand-lime perforated bricks, KSL e.g. according to DIN V 106:2005-10 / EN 771-2:2011 | ≥ 1,6 | 12 | Vertically perforation more than 15 %. | rotary | 0,9 ²⁾ |
| Lightweight concrete solid blocks, V e.g. according to DIN V 18152-100:2005-10 / EN 771-3:2011 | ≥ 0,7 | 4 | | hammer | 0,75 |
| Lightweight concrete hollow blocks, Hbl e.g. according to approval Z-17.1-797, DIN V 18151-100:2005-10 / EN 771-3:2011 | ≥ 1,2 | 6 | | rotary | 0,6 |
| Lightweight aggregate concrete, LAC 4 – LAC 25 e.g. according to EN 1520:2011-06 / EN 771-3:2011 | ≥ 0,7 | 4 | | rotary | 0,9 |
| Autoclaved aerated concrete, AAC 4 – AAC 7 e.g. according to DIN V 4165-100:2005-10 / EN 771-4:2011 | ≥ 0,55 | 4 | | rotary | 0,5 |
| Carbon Fix | | | | | Annex C 1 |
| Performances Characteristic resistance | | | | | |

- ¹⁾ The value applies only for outer web thickness ≥ 11 mm; otherwise the characteristic resistance shall be determined by job site pull-out tests.
²⁾ The value applies only for outer web thickness ≥ 20 mm; otherwise the characteristic resistance shall be determined by job site pull-out tests.

Table C2: Point thermal transmittance according EOTA Technical Report TR 025:2007-06

| anchor type | insulation thickness h_D [mm] | point thermal transmittance χ [W/K] |
|-------------|---------------------------------------|--|
| Carbon Fix | 60 – 260 | 0,001 |

Table C3: Plate stiffness according EOTA Technical Report TR 026:2007-06

| anchor type | diameter of the anchor plate [mm] | load resistance of the anchor plate [kN] | plate stiffness [kN/mm] |
|-------------|---|--|----------------------------|
| Carbon Fix | 60 | 1,5 | 1,17 |

Table C4: Displacements

| Base materials | Bulk density class ρ [kg/dm ³] | Min. compressive strength f_b [N/mm ²] | Tension load N [kN] | Displacements $\delta(N)$ [mm] |
|---|--|---|---------------------------|--------------------------------------|
| Concrete C16/20– C50/60 EN 206-1:2000 | | | 0,3 | 0,4 |
| Thin concrete members (e.g. weather resistant skin) Concrete C12/15 – C50/60 EN 206-1:2000 | | | 0,3 | 0,5 |
| Clay bricks, Mz DIN 105-100:2012-01 / EN 771-1:2011 | ≥ 1,8 | 12 | 0,3 | 0,5 |
| Sand-lime solid bricks, KS DIN V 106:2005-10 / EN 771-2:2011 | ≥ 1,8 | 12 | 0,3 | 0,3 |
| Vertically perforated clay bricks, HLz DIN 105-100:2012-01 / EN 771-1:2011 | ≥ 0,9 | 12 | 0,2 | 0,5 |
| Sand-lime perforated bricks, KSL DIN V 106:2005-10 / EN 771-2:2011 | ≥ 1,4 | 12 | 0,3 | 0,4 |
| Solid masonry of lightweight aggregate concrete, V DIN V 18152-100:2005-10 / EN 771-3:2011 | ≥ 0,7 | 4 | 0,25 | 0,4 |
| Hollow masonry of lightweight aggregate concrete, Hbl DIN V 18151-100:2005-10 / EN 771-3:2011 | ≥ 1,2 | 6 | 0,2 | 0,4 |
| Lightweight aggregate concrete, LAC 4 – LAC 25 EN 1520:2011-06 / EN 771-3:2011 | ≥ 0,7 | 4 | 0,3 | 0,5 |
| Autoclaved aerated concrete, AAC 4 – AAC 7 DIN V 4165-100:2005-10 / EN 771-4:2011 | ≥ 0,55 | 4 | 0,15 | 0,4 |

Carbon Fix

Performances

Point thermal transmittance, plate stiffness
displacements

Annex C 2