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-11/0192 of 29 January 2015

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 | EJOT H1 eco and EJOT H4 eco |
| 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 | EJOT Baubefestigungen GmbH<br>In der Stockwiese 35<br>57334 Bad Laasphe<br>DEUTSCHLAND |
| Manufacturing plant | EJOT Herstellwerk 1, 2, 3, 4 |
| This European Technical Assessment contains | 16 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,<br>Edition February 2011,<br>used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011. |
| This version replaces | ETA-11/0192 issued on 8 January 2014 |

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## Specific part

### 1 Technical description of the product

The nailed-in anchors EJOT H1 eco and EJOT H4 eco consists of an anchor sleeve with an enlarged shaft, spreading zone subsequently, an insulation plate made of polyethylene, a mounting plug made of polyamide and accompanying specific nail of galvanised steel. For the anchor length of 95mm (only H1 eco) the accompanying specific nail of galvanised steel has 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 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 verification 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 Safety in case of fire (BWR 2)

Not applicable.

#### 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 Regulation (EU) No 305/2011, these requirements need also to be complied with, when and where they apply.

#### 3.4 Safety in use (BWR 4)

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

### 3.5 Protection against noise (BWR 5)

Not applicable.

### 3.6 Energy economy and heat retention (BWR 6)

Not applicable.

### 3.7 Sustainable use of natural resources (BWR 7)

For the sustainable use of natural resources no performance was determined 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 97/463/EC of the Commission of 27 June 1997 (Official Journal of the European Communities L 198 of 25.07.1997, p. 31–32) the system of assessment and verification of constancy of performance (AVCP) (see Annex V and Article 65 Paragraph 2 to Regulation (EU) No 305/2011) given in the following table apply.

| Product | Intended use | Level or class | System |
|---|---|---|---|
| Plastic anchors for use in concrete and masonry | For use in systems, such as façade systems, for fixing or supporting elements which contribute to the stability of the systems | — | 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.

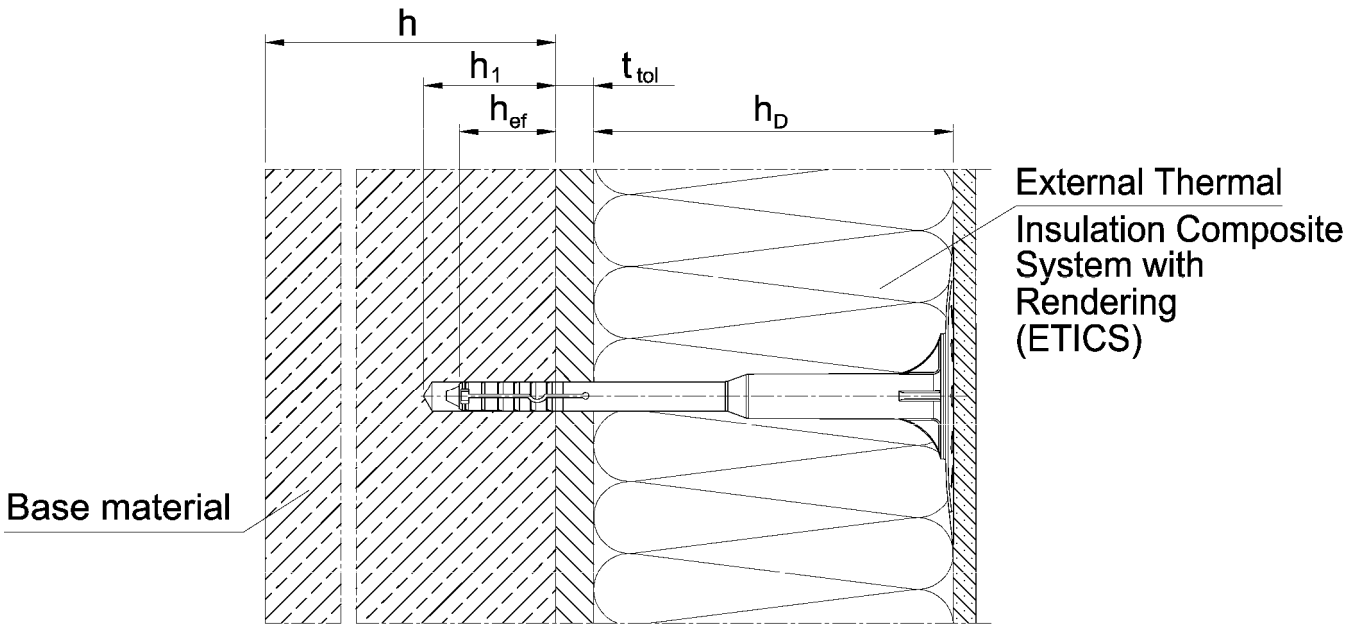
Issued in Berlin on 29 January 2015 by Deutsches Institut für Bautechnik

Andreas Kummerow
p. p. Head of Department

*beglaubigt:*
Ziegler

Deutsches Institut für Bautechnik DIBt

## EJOT H1 eco




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 |



| | |
|---|---|
| **EJOT H1 eco and EJOT H4 eco** | **Annex A 1** |
| **Product description**<br>Installed condition EJOT H1 eco | |

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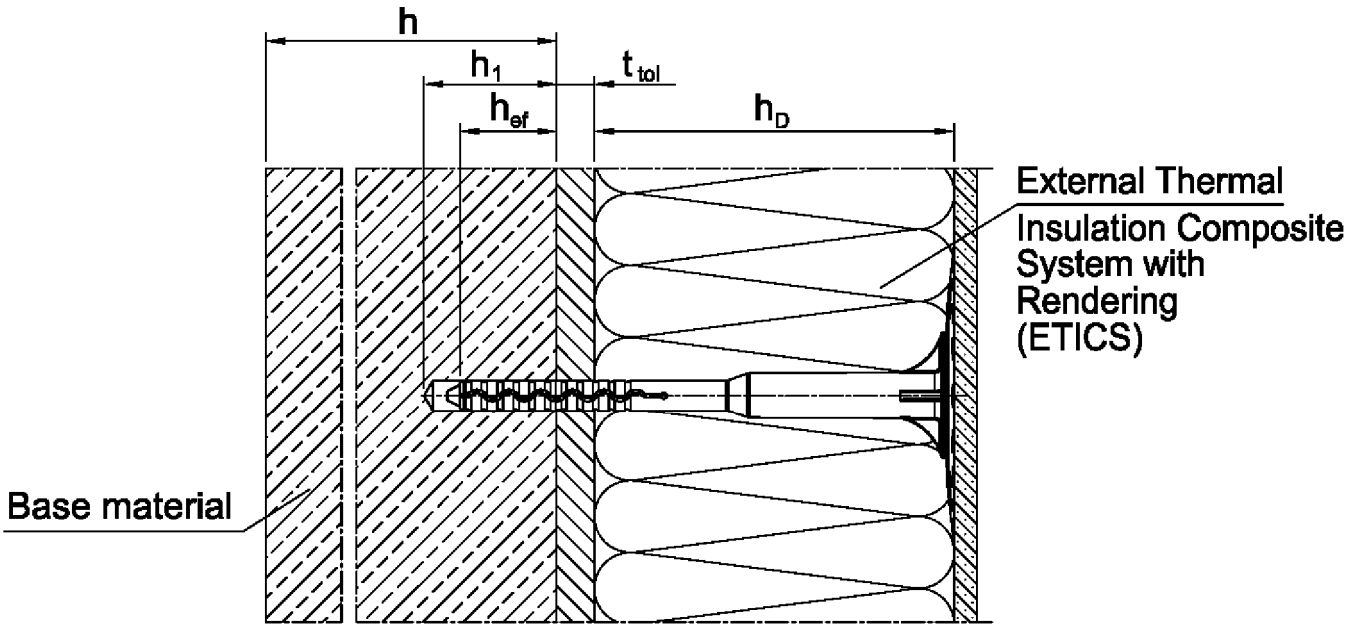
## EJOT H4 eco




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 |



| | |
|---|---|
| **EJOT H1 eco and EJOT H4 eco** | **Annex A 2** |
| **Product description**<br>Installed condition EJOT H4 eco | |

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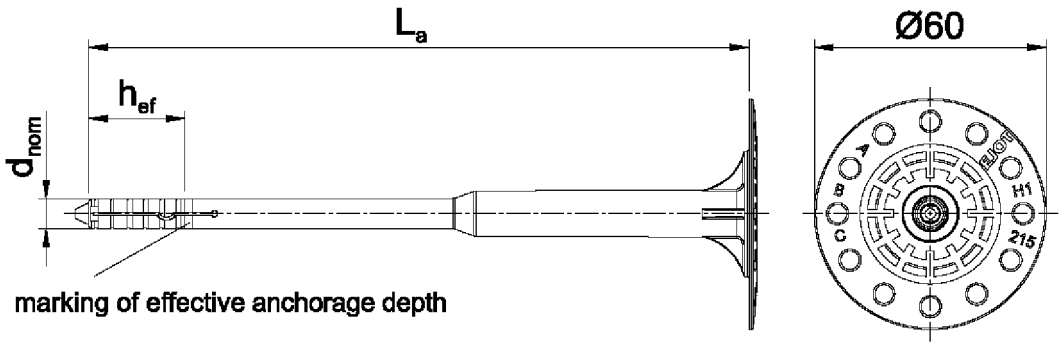
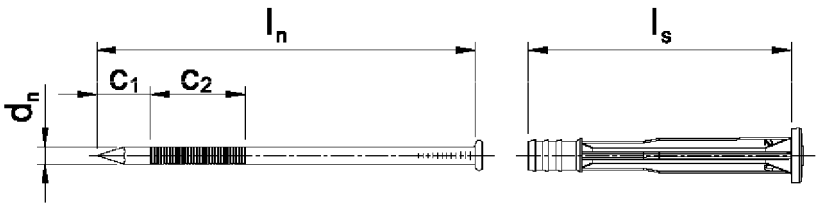
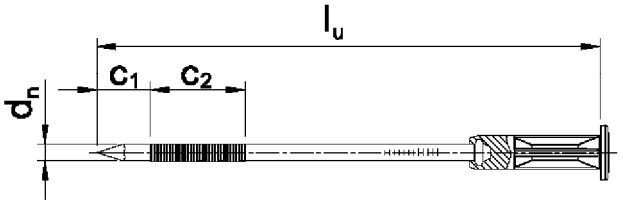
## EJOT H1 eco




accompanying specific nail  mounting plug

**Marking:**
**Identifying mark (EJOT)**
**Anchor type (H1 eco)**
**Length of anchor (e.g. 175)**




**Length of anchor 95mm: accompanying specific nail with overmolding**

**Table A1: Dimensions**

| Anchor type | Anchor Sleeve | | | Mounting Plug | Specific nail | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | $d_{nom}$ [mm] | $h_{ef}$ [mm] | min $L_a$ max $L_a$ [mm] | min $l_s$ max $l_s$ [mm] | $d_n$ [mm] | $c_1$ [mm] | $c_2$ [mm] | min $l_n$ max $l_n$ [mm] | $l_u$ [mm] |
| EJOT H1 eco | 8 | 25 | 95<br>295 | 32<br>110 | 4,5 | 14 | 25 | 60<br>180 | 90 |

Determination of maximum thickness of insulation $h_D$ [mm] for EJOT H1 eco:

$h_D = L_a - t_{tol} - h_{ef}$ ($L_a$ = e.g. 95; $t_{tol}$ = 10)

e.G. $h_D = 95 - 10 - 25$

$h_{Dmax} = 60$

| **EJOT H1 eco and EJOT H4 eco** | **Annex A 3** |
|---|---|
| **Product description**<br>Marking and dimension of the anchor sleeve, expansion element for EJOT H1 eco | |

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## EJOT H4 eco

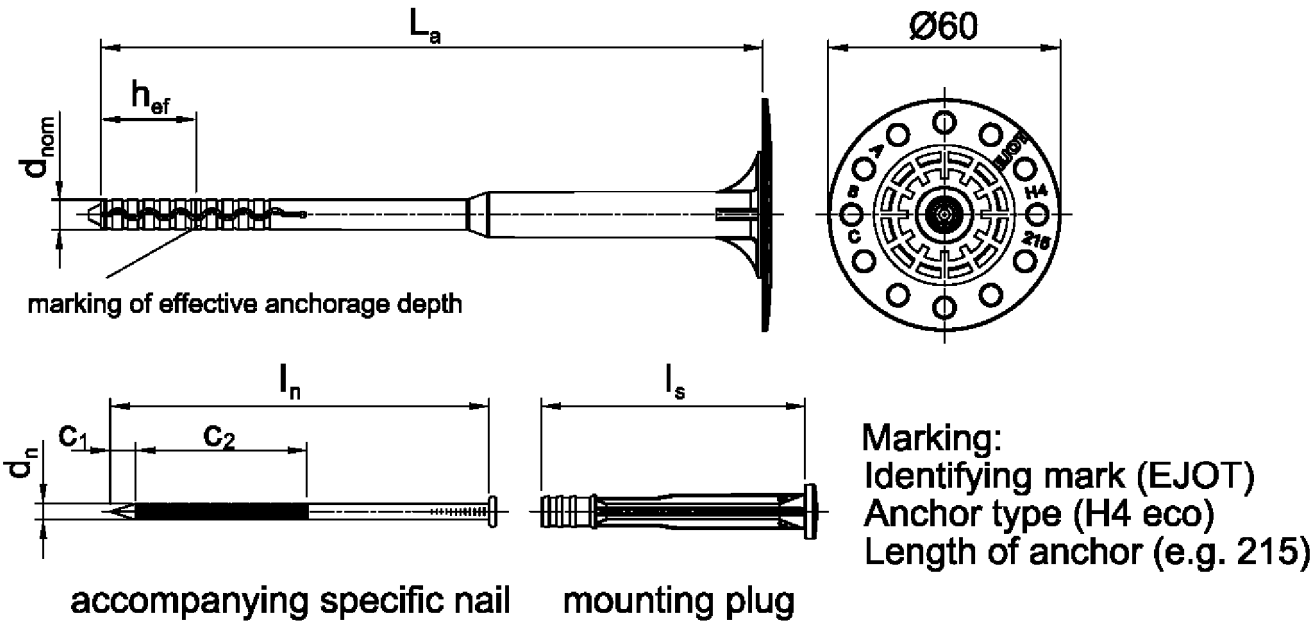


**Table A2: Dimensions**

| Anchor type | Anchor Sleeve | | | Mounting Plug | Specific nail | | | |
|---|---|---|---|---|---|---|---|---|
| | $d_{nom}$ [mm] | $h_{ef}$ [mm] | min $L_a$ max $L_a$ [mm] | min $l_s$ max $l_s$ [mm] | $d_n$ [mm] | $c_1$ [mm] | $c_2$ [mm] | min $l_n$ max $l_n$ [mm] |
| EJOT H4 eco | 8 | 25 | 155<br>295 | 72<br>110 | 4,3 | 7 | 45 | 80<br>180 |

Determination of maximum thickness of insulation $h_D$ [mm] for EJOT H4 eco:

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

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

$h_{Dmax} = 120$



| | |
|---|---|
| **EJOT H1 eco and EJOT H4 eco** | **Annex A 4** |
| **Product description**<br>Marking and dimension of the anchor sleeve, expansion element for EJOT H4 eco | |

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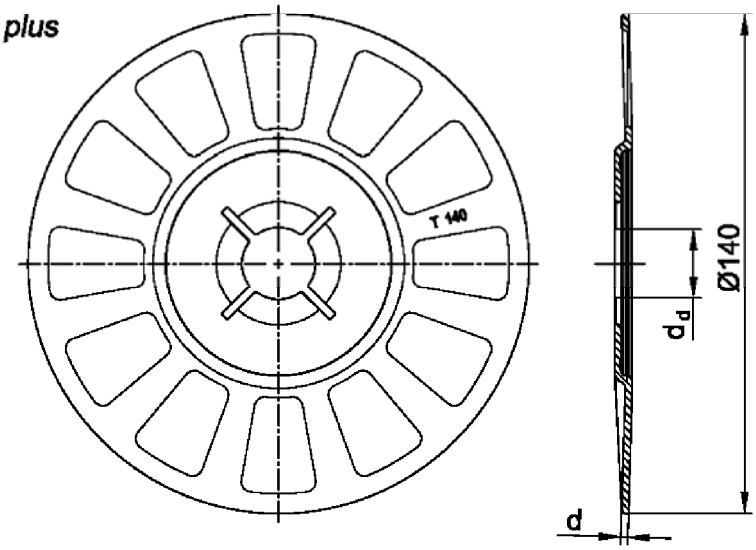
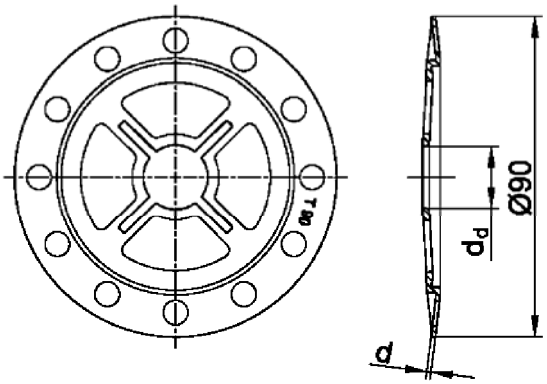
| **Table A3: Materials** | |
|---|---|
| Name | Materials |
| Anchor sleeve | Polyethylene, PE-HD nature, yellow, orange, red, blue, grey |
| Mounting plug | Polyamide, PA GF 50 |
| Specific nail | Steel, electro galvanized ≥ 5 µm according to EN ISO 4042:2001-01, blue passivated $f_{yk}$ ≥ 670 N/mm² |

**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



| **EJOT H1 eco and EJOT H4 eco** | **Annex A 5** |
|---|---|
| **Product description**<br>Materials,<br>Slip on plates with EJOT H1 eco and EJOT H4 eco | |

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## Specifications of intended use

### Anchorages 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.
- For other base materials of the use categories A, B, or C 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



| | |
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| **EJOT H1 eco und EJOT H4 eco** | **Annex B 1** |
| **Intended use**<br>Specifications | |

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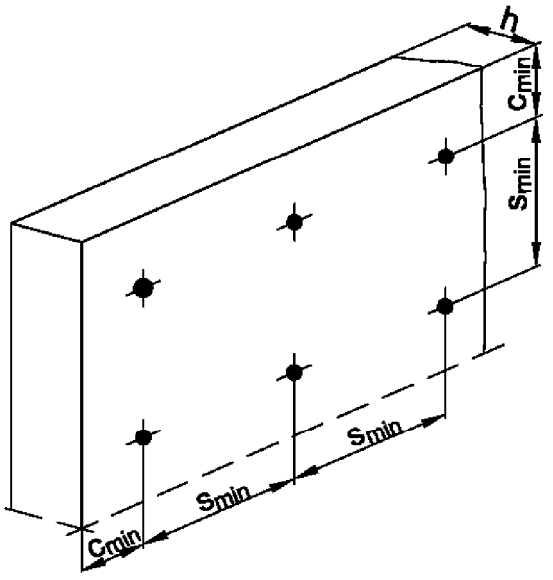
| **Table B1: Installation parameters** | | |
|---|---|---|
| Anchor type | | EJOT H1 eco / EJOT H4 eco |
| Drill hole diameter | $d_0$ [mm] = | 8 |
| Cutting diameter of drill bit | $d_{cut}$ [mm] ≤ | 8,45 |
| Depth of drilles hole to deepest point | $h_1$ [mm] ≥ | 35 |
| Effective anchorage depth | $h_{ef}$ [mm] ≥ | 25 |

| **Table B2: Anchor distances and dimensions of members** | | |
|---|---|---|
| Anchor type | | EJOT H1 eco / EJOT H4 eco |
| Minimum allowable spacing | $s_{min}$ ≥ [mm] | 100 |
| Minimum allowable edge distance | $c_{min}$ ≥ [mm] | 100 |
| Minimum thickness of member | h ≥ [mm] | 100 |

Scheme of distances and spacings






| **EJOT H1 eco and EJOT H4 eco** | **Annex B 2** |
|---|---|
| **Intended use**<br>Installations parameters,<br>Edge distances and spacing | |

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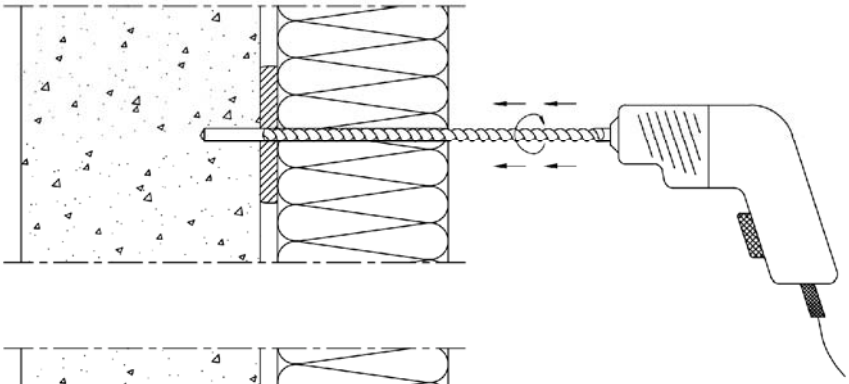
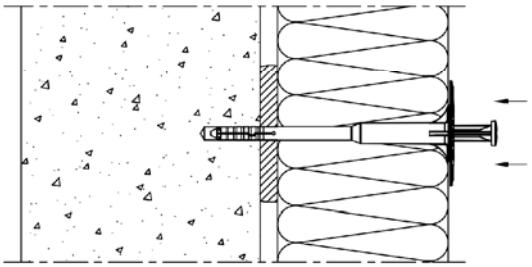
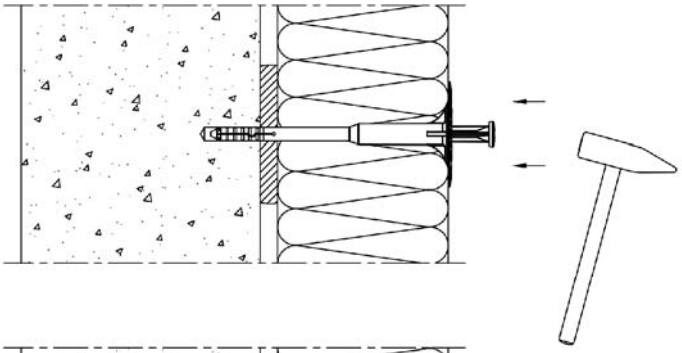
## Installation instructions EJOT H1 eco



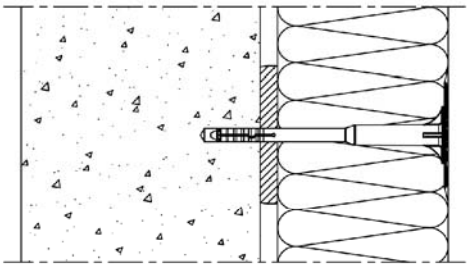
Drill the hole perpendicular to the substrate surface.
Clean the drill hole 3x.



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 of
EJOT H1 eco.



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| **EJOT H1 eco and EJOT H4 eco** | **Annex B 3** |
| **Intendend use**<br>Installation instructions EJOT H1 eco | |

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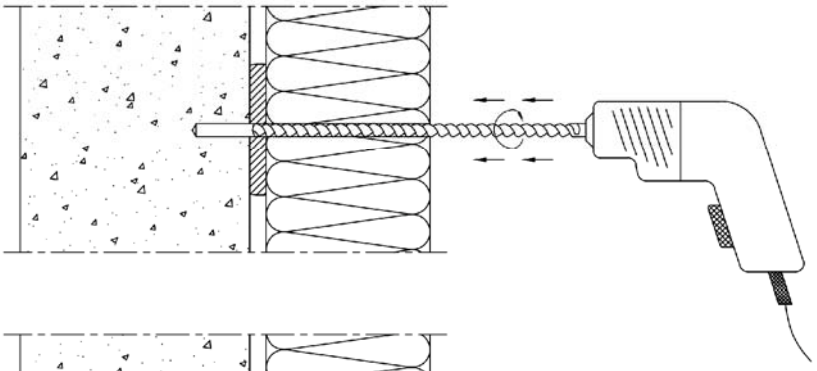
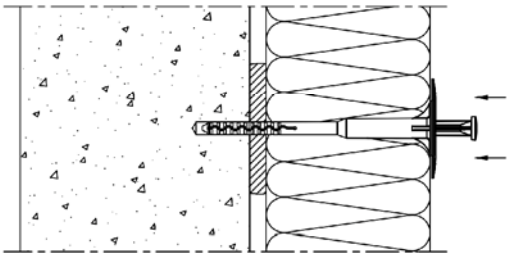
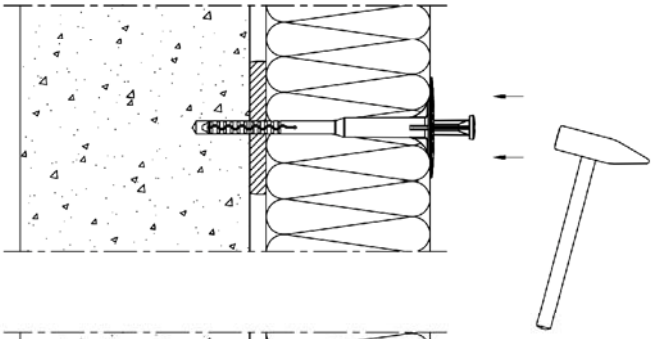
## Installation instructions EJOT H4 eco



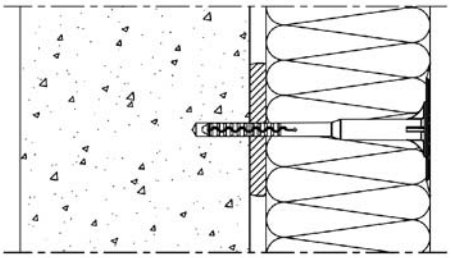
Drill the hole perpendicular to the substrate surface.
Clean the drill hole 3x.



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 of EJOT H4 eco.



| | |
|---|---|
| **EJOT H1 eco and EJOT H4 eco** | **Annex B 4** |
| **Intendend use**<br>Installation instructions EJOT H4 eco | |

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**Table C1: Characteristic resistance to tension loads $N_{Rk}$ in concrete and masonry for a single anchor in kN**

| Anchor type | | | | | EJOT H1 eco | EJOT H4 eco |
|---|---|---|---|---|---|---|
| Base materials | Bulk density class ρ [kg/dm³] | minimum compressive strength $f_b$ [N/mm²] | General remarks | Drill method | $N_{Rk}$ [kN] | $N_{Rk}$ [kN] |
| Concrete C12/15<br>EN 206-1:2000-12 | | | EN 206-1:2000-12 | hammer | 0,90 | 0,50 |
| Concrete C20/25 – C50/60<br>EN 206-1:2000-12 | | | EN 206-1:2000-12 | hammer | 0,90 | 0,75 |
| Clay bricks, Mz<br>e.g. according to<br>DIN 105-100:2012-01 /<br>EN 771-1:2011-07 | ≥ 1,8 | 12 | Vertically perforation up to 15 %. | hammer | 0,90 | 0,75 |
| Sand-lime solid bricks, KS<br>e.g. according to<br>DIN V 106:2005-10 /<br>EN 771-2:2011-07 | ≥ 1,8 | 12 | Vertically perforation up to 15 %. | hammer | 0,90 | 0,75 |
| Vertically perforated clay bricks, HLz<br>e.g. according to<br>DIN 105-100:2012-01 /<br>EN 771-1:2011-07 | ≥ 1,2 | 20 | Vertically perforation more than 15 % and less than 50 %. | rotary | 0,75 [1)] | - |
| Vertically perforated clay bricks, HLz<br>e.g. according to<br>DIN 105-100:2012-01 /<br>EN 771-1:2011-07 | ≥ 0,9 | 12 | Vertically perforation more than 15 % and less than 50 %. | rotary | 0,60 [2)] | 0,50 [2)] |
| Sand-lime perforated bricks, KSL<br>e.g. according to<br>DIN V 106:2005-10 /<br>EN 771-2:2011-07 | ≥ 1,4 | 12 | Vertically perforation more than 15 %. | rotary | 0,9 [3)] | 0,75 [3)] |

1) The value applies only for outer web thickness ≥ 14 mm; otherwise the characteristic resistance shall be determined by job site pull-out tests.
2) The value applies only for outer web thickness ≥ 11 mm; otherwise the characteristic resistance shall be determined by job site pull-out tests.
3) The value applies only for outer web thickness ≥ 20 mm; otherwise the characteristic resistance shall be determined by job site pull-out tests.

| **EJOT H1 eco and H4 eco** | **Annex C 1** |
|---|---|
| **Performances**<br>Characteristic resistance | |

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## EJOT H1 eco

| Table C2: Point thermal transmittance according EOTA Technical Report TR 025:2007-06 | | |
|---|---|---|
| anchor type | insulation thickness<br>$h_D$<br>[mm] | point thermal transmittance<br>$\chi$<br>[W/K] |
| EJOT H1 eco | 60 – 260 | 0,001 |

| Table C3: Plate stiffness according EOTA Technical Report TR 026:2007-06 | | | |
|---|---|---|---|
| anchor type | diameter of the anchor plate<br>[mm] | load resistance oft the anchor plate<br>[mm] | plate stiffness<br>[kN/mm] |
| EJOT H1 eco | 60 | 1,4 | 0,60 |

| Table C4: Displacements EJOT H1 eco | | | | |
|---|---|---|---|---|
| Base materials | Bulk density Class<br>$\rho$<br>[kg/dm³] | Minimum Compressive strength<br>$f_b$<br>[N/mm²] | Tension load<br>N<br>[kN] | Displacements<br>$\delta$(N)<br>[kN/mm] |
| Concrete C12/15 – C50/60<br>EN 206-1:2000-12 | | | 0,3 | 0,3 |
| Clay bricks, Mz<br>e.g. according to<br>DIN 105-100:2012-01 /<br>EN 771-1:2011-07 | ≥ 1,8 | 12 | 0,3 | 0,3 |
| Sand-lime solid bricks, KS<br>e.g. according to<br>DIN V 106:2005-10 /<br>EN 771-2:2011-07 | ≥ 1,8 | 12 | 0,3 | 0,3 |
| Vertically perforated clay bricks, HLz<br>e.g. according to<br>DIN 105-100:2012-01 /<br>EN 771-1:2011-07 | ≥ 1,2 | 20 | 0,25 | 0,4 |
| Vertically perforated clay bricks, HLz<br>e.g. according to<br>DIN 105-100:2012-01 /<br>EN 771-1:2011-07 | ≥ 0,9 | 12 | 0,2 | 0,2 |
| Sand-lime perforated bricks, KSL<br>e.g. according to<br>DIN V 106:2005-10 /<br>EN 771-2:2011-07 | ≥ 1,4 | 12 | 0,3 | 0,3 |



| **EJOT H1 eco and EJOT H4 eco** | **Annex C 2** |
|---|---|
| **Performances**<br>Point thermal transmittance, plate stiffness and displacements for EJOT H1 eco | |

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## EJOT H4 eco

| Table C5: Point thermal transmittance according EOTA Technical Report TR 025:2007-06 | | |
|---|---|---|
| anchor type | insulation thickness<br>$h_D$<br>[mm] | point thermal transmittance<br>$\chi$<br>[W/K] |
| EJOT H4 eco | 60 – 260 | 0,002 |

| Table C6: Plate stiffness according EOTA Technical Report TR 026:2007-06 | | | |
|---|---|---|---|
| anchor type | diameter of the anchor plate<br>[mm] | load resistance oft the anchor plate<br>[mm] | plate stiffness<br>[kN/mm] |
| EJOT H4 eco | 60 | 1,4 | 0,60 |

| Table C7: Displacements EJOT H4 eco | | | | |
|---|---|---|---|---|
| Base materials | Bulk density Class<br>$\rho$<br>[kg/dm³] | Minimum Compressive strength<br>$f_b$<br>[N/mm²] | Tension load<br>N<br>[kN] | Displacements<br>$\delta$(N)<br>[kN/mm] |
| Concrete C12/15 – C50/60<br>EN 206-1:2000-12 | | | 0,30 | 0,6 |
| Clay bricks, Mz<br>e.g. according to<br>DIN 105-100:2012-01 /<br>EN 771-1:2011-07 | ≥ 1,8 | 12 | 0,25 | 0,4 |
| Sand-lime solid bricks, KS<br>e.g. according to<br>DIN V 106:2005-10 /<br>EN 771-2:2011-07 | ≥ 1,8 | 12 | 0,25 | 0,4 |
| Vertically perforated clay bricks, HLz<br>e.g. according to<br>DIN 105-100:2012-01 /<br>EN 771-1:2011-07 | ≥ 0,9 | 12 | 0,15 | 0,6 |
| Sand-lime perforated bricks, KSL<br>e.g. according to<br>DIN V 106:2005-10 /<br>EN 771-2:2011-07 | ≥ 1,4 | 12 | 0,25 | 0,4 |