

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-17/0991
of 10 September 2019

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

ejothem S1

Product family
to which the construction product belongs

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

Manufacturer

EJOT Baubefestigungen GmbH
In der Stockwiese 35
57334 Bad Laasphe
DEUTSCHLAND

Manufacturing plant

manufacturing plant EJOT 1, 2, 3 and 4

This European Technical Assessment
contains

15 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

EAD 330196-01-0604

This version replaces

ETA-17/0991 issued on 18 July 2018

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Specific Part

1 Technical description of the product

The screwed-in anchor ejotherm S1 consists of an anchor sleeve made of polyethylene (virgin material), an anchor plate made of polyethylene (virgin material) and an accompanying specific screw made of polyamide (virgin material).

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 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 Safety and accessibility in use (BWR 4)

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

3.2 Energy economy and heat retention (BWR 6)

| Essential characteristic | Performance |
|-----------------------------|---------------|
| Point thermal transmittance | See Annex C 2 |

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

In accordance with EAD No. 330196-01-0604, the applicable European legal act is: [97/463/EC].

The system to be applied is: 2+

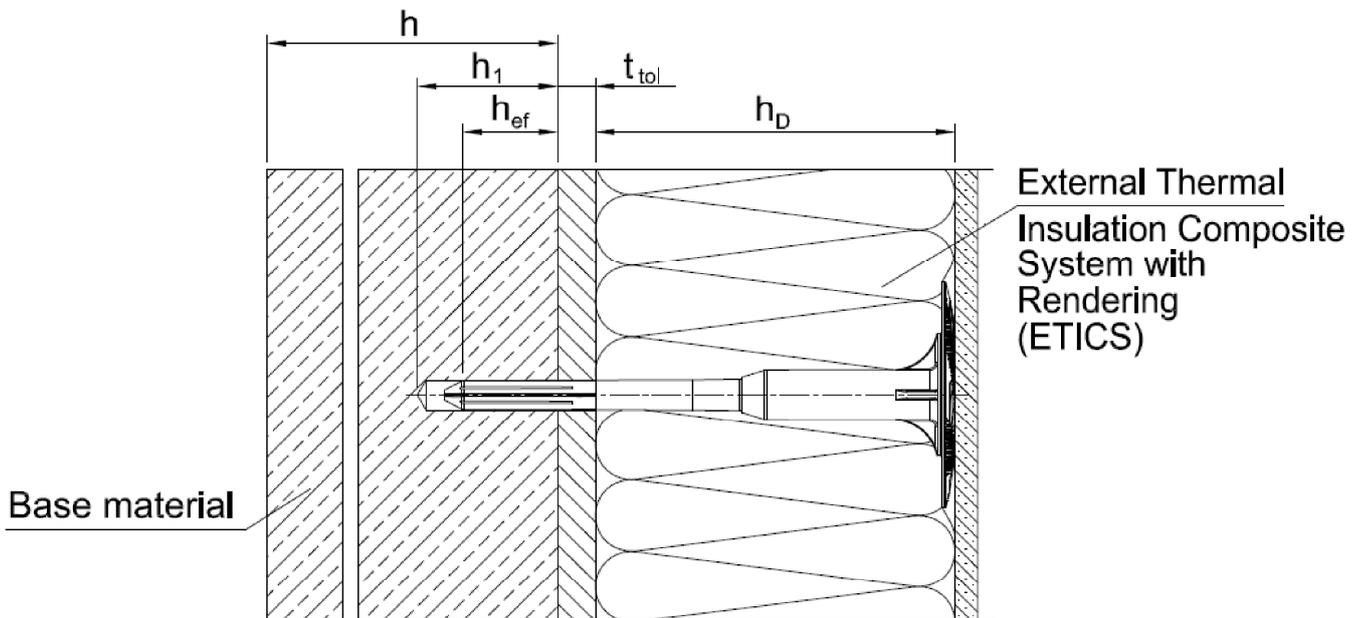
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

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 10 September 2019 by Deutsches Institut für Bautechnik

Dr.-Ing. Lars Eckfeldt
p. p. Head of Department

beglaubigt:
Ziegler



Intended use

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

Legend:

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

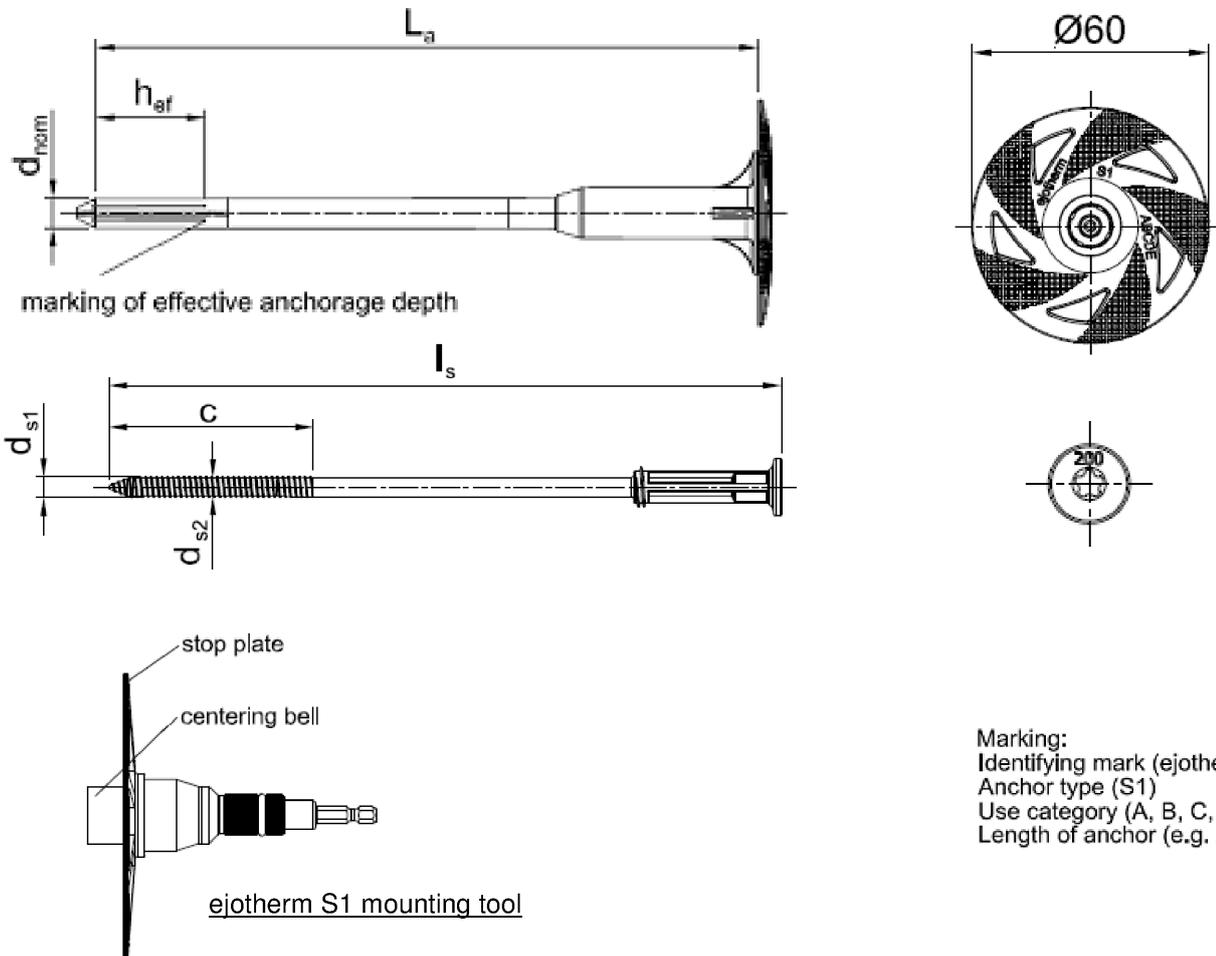
ejotherm S1

Product description

Installed condition ejotherm S1

Annex A 1

ejotherm S1 in use category A, B, C, D



Marking:
Identifying mark (ejotherm)
Anchor type (S1)
Use category (A, B, C, D, E)
Length of anchor (e.g. 200)

Table A1: Dimensions

| Anchor Type | Anchor Sleeve | | | Plastic screw | | | |
|-------------|-------------------|------------------|--------------------------------|------------------|------------------|-------------|--------------------------------|
| | d_{nom} [mm] | h_{ef} [mm] | min L_a max L_a [mm] | d_{s1} [mm] | d_{s2} [mm] | c [mm] | min l_s max l_s [mm] |
| ejotherm S1 | 8 | 30 | 100 300 | 5,7 | 5,0 | 55 | 100 300 |

Determination of maximum thickness of insulation h_D [mm] ejotherm S1:

$$h_D = L_a - t_{tol} - h_{ef}$$

e.g. $h_D = 200 - 10 - 30$
 $h_{Dmax} = 160$

ejotherm S1

Product description

Marking and dimension of the anchor sleeve; use category: A, B, C, D
Plastic screw

Annex A 2

ejotherm S1 in use category A, B, C, D – large version

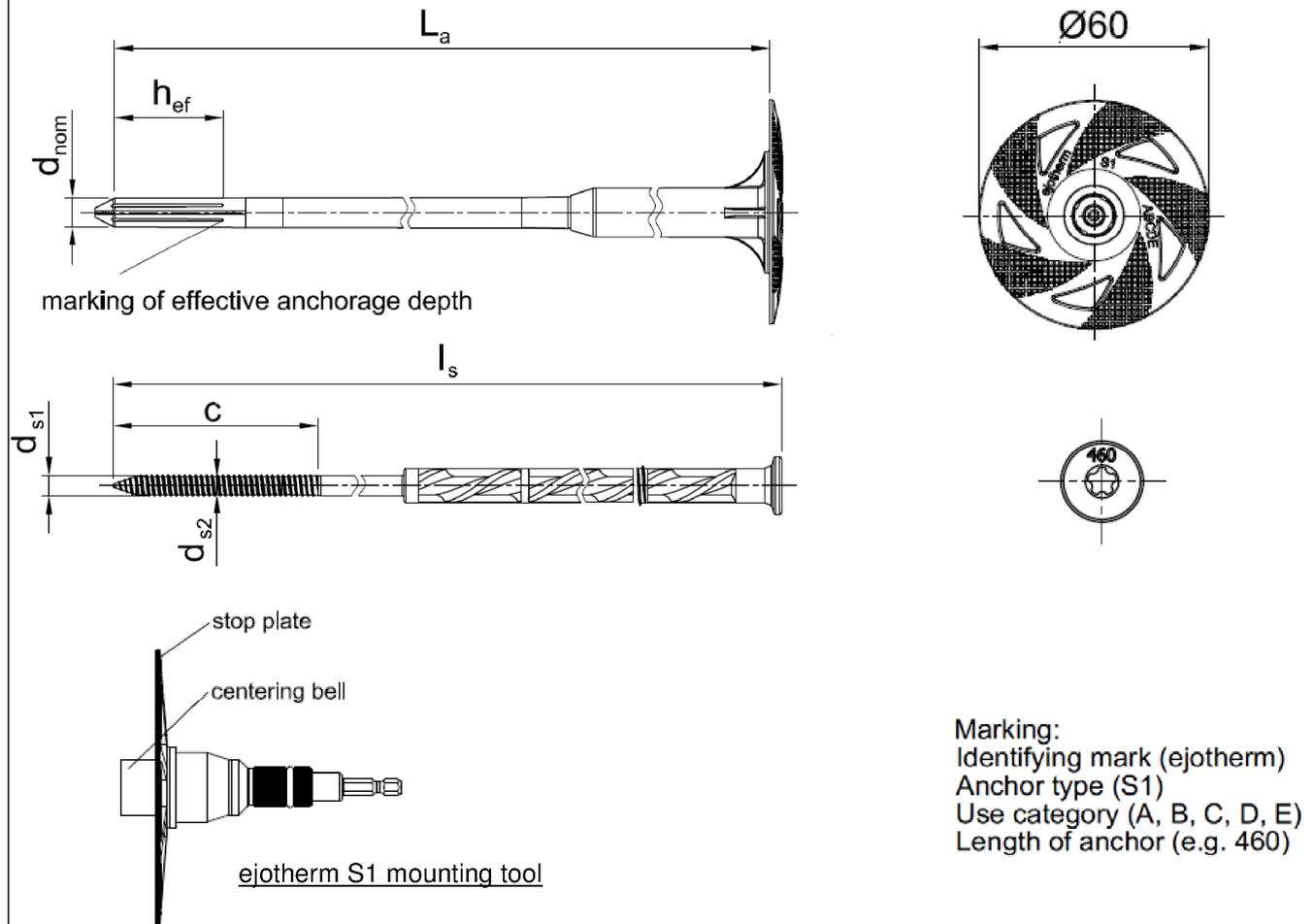


Table A2: Dimensions

| Anchor Type | Anchor Sleeve | | | Plastic screw | | | |
|-------------|-------------------|------------------|--------------------------------|------------------|------------------|-------------|--------------------------------|
| | d_{nom} [mm] | h_{ef} [mm] | min L_a max L_a [mm] | d_{s1} [mm] | d_{s2} [mm] | c [mm] | min l_s max l_s [mm] |
| ejotherm S1 | 8 | 30 | 320 460 | 5,7 | 5,0 | 55 | 320 460 |

Determination of maximum thickness of insulation h_D [mm] ejotherm S1:

$$h_D = L_a - t_{tol} - h_{ef}$$

e.g. $h_D = 460 - 10 - 30$

$$h_{Dmax} = 420$$

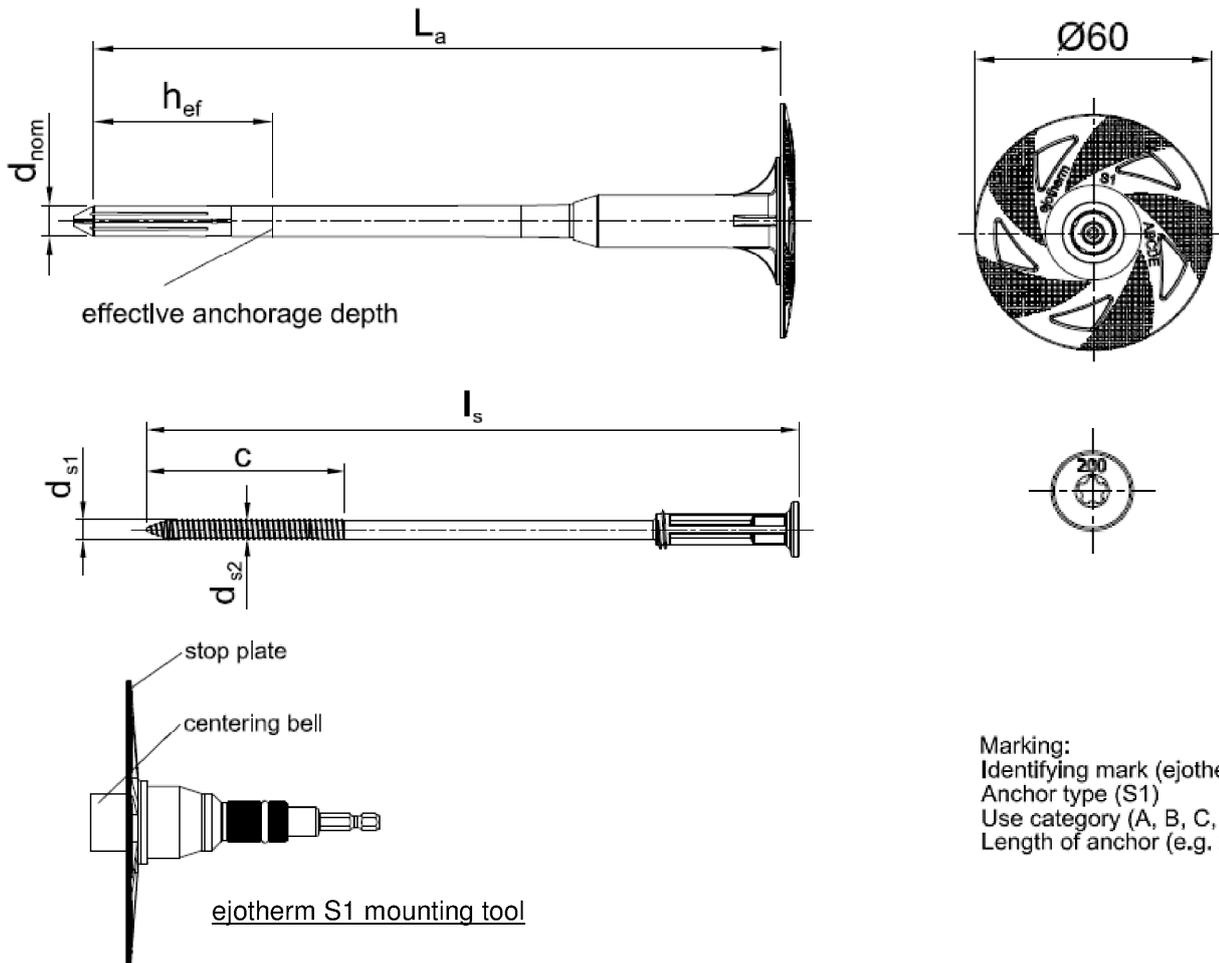
ejotherm S1

Product description

Marking and dimension of the anchor sleeve – large version; use category: A, B, C, D
Plastic screw

Annex A 3

ejotherm S1 in use category E



Marking:
Identifying mark (ejotherm)
Anchor type (S1)
Use category (A, B, C, D, E)
Length of anchor (e.g. 200)

Table A3: Dimensions

| Anchor Type | Anchor Sleeve | | | Plastic screw | | | |
|-------------|-------------------|------------------|--------------------------------|------------------|------------------|-------------|--------------------------------|
| | d_{nom} [mm] | h_{ef} [mm] | min L_a max L_a [mm] | d_{s1} [mm] | d_{s2} [mm] | c [mm] | min l_s max l_s [mm] |
| ejotherm S1 | 8 | 50 | 100 300 | 5,7 | 5,0 | 55 | 100 300 |

Determination of maximum thickness of insulation h_D [mm] ejotherm S1:

$$h_D = L_a - t_{tol} - h_{ef}$$

e.g. $h_D = 200 - 10 - 50$
 $h_{Dmax} = 140$

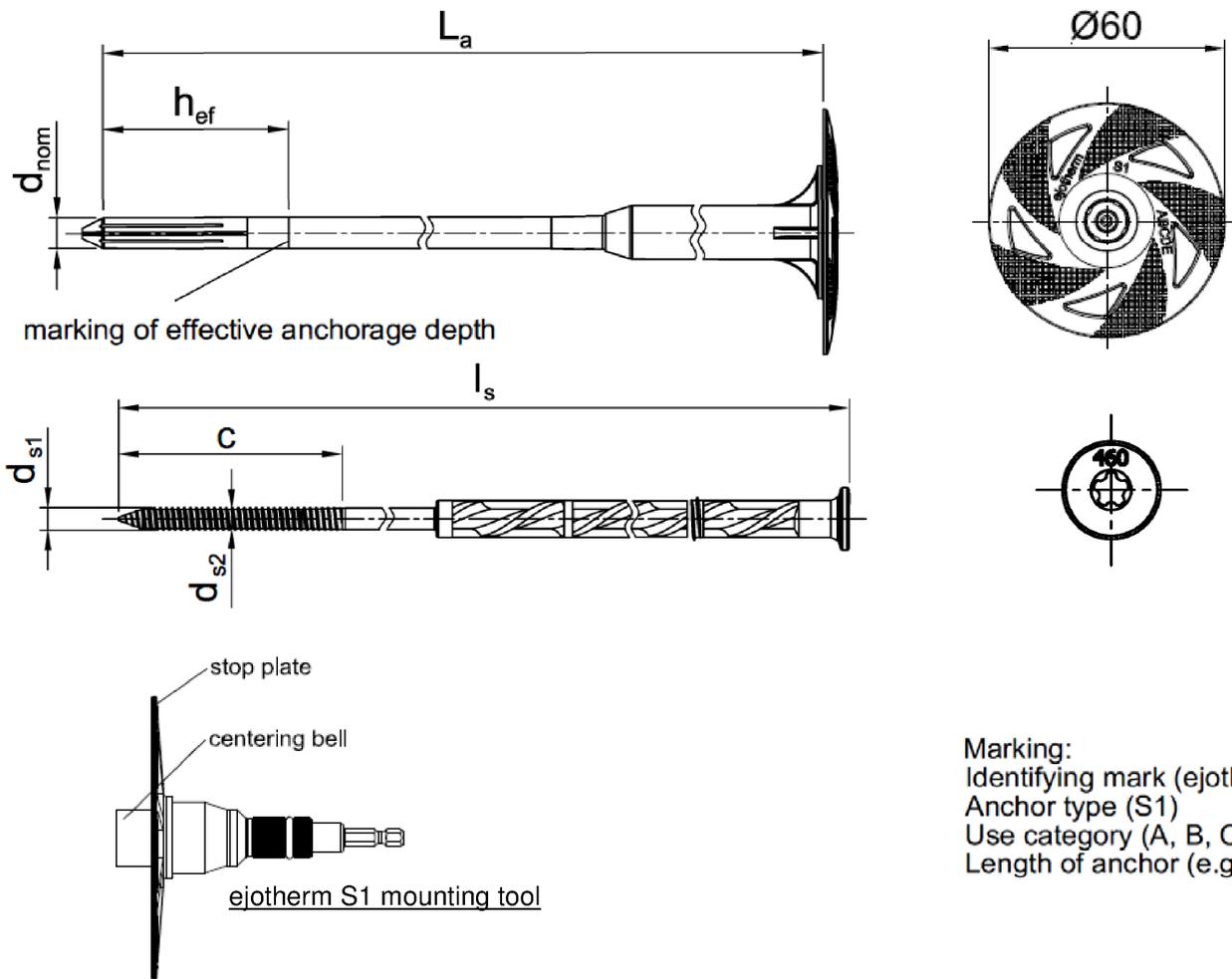
ejotherm S1

Product description

Marking and dimension of the anchor sleeve; use category: E
Plastic screw

Annex A 4

ejotherm S1 in use category E – large version



Marking:
Identifying mark (ejotherm)
Anchor type (S1)
Use category (A, B, C, D, E)
Length of anchor (e.g. 460)

Table A4: Dimensions

| Anchor Type | Anchor Sleeve | | | Plastic screw | | | |
|-------------|-------------------|------------------|--------------------------------|------------------|------------------|-------------|--------------------------------|
| | d_{nom} [mm] | h_{ef} [mm] | min L_a max L_a [mm] | d_{s1} [mm] | d_{s2} [mm] | c [mm] | min l_s max l_s [mm] |
| ejotherm S1 | 8 | 50 | 320 460 | 5,7 | 5,0 | 55 | 320 460 |

Determination of maximum thickness of insulation h_D [mm] ejotherm S1:

$$h_D = L_a - t_{tol} - h_{ef}$$

e.g. $h_D = 460 - 10 - 50$
 $h_{Dmax} = 400$

ejotherm S1

Product description

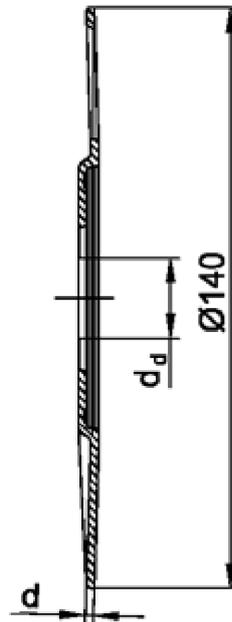
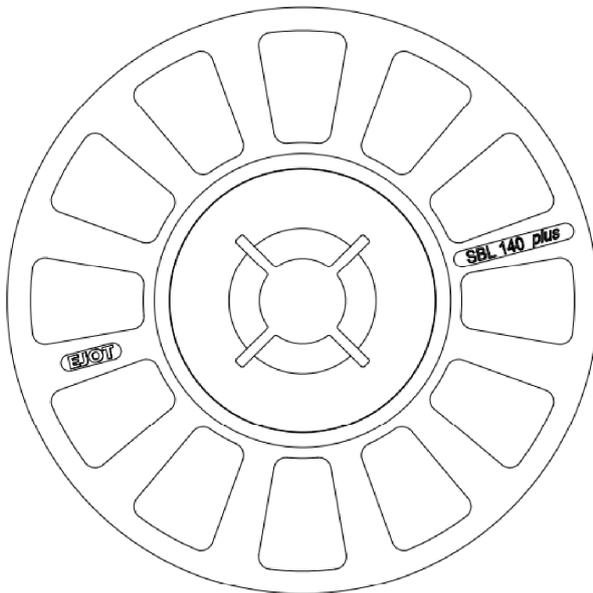
Marking and dimension of the anchor sleeve – large version; use category: E
Plastic screw

Annex A 5

Table A5: Materials ejotherm S1

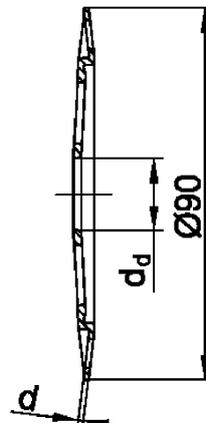
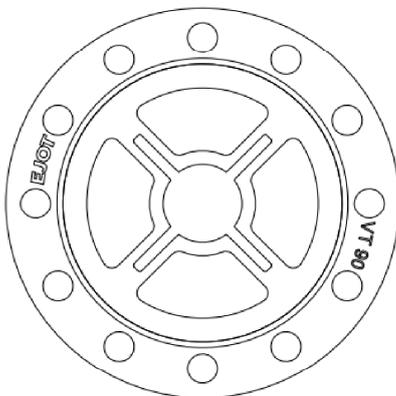
| Designation | Material |
|---------------|---|
| Anchor plate | Polyethylene (virgin material) PE-HD, nature, yellow, orange, red, blue, grey, white, nature, green, anthracite |
| Anchor sleeve | Polyethylene (virgin material) PE-HD, nature, yellow, orange, red, blue, grey, white, nature, green, anthracite |
| Plastic screw | Polyamide (virgin material) PA 6 GF 50, nature, black |

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

ejotherm S1

Product description
Materials of ejotherm S1 and slip on plates

Annex A 6

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 C1.
- Solid masonry (use category B), according to Annex C1.
- Hollow or perforated masonry (use category C), according to Annex C1.
- Prefabricated reinforced components of lightweight aggregate concrete (LAC) (use category D), according to Annex C1.
- Autoclaved aerated Concrete (use category E), according to Annex C1.
- 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 EOTA Technical Report TR 51 edition December 2016.

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 under the responsibility of an engineer experienced in accordance and masonry work with the partial safety factors $\gamma_m = 2,0$ and $\gamma_F = 1,5$ if there are no other regulations.
- 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 C1.
- 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

| | |
|------------------------------------|------------------|
| ejotherm S1 | Annex B 1 |
| Intended use Specifications | |

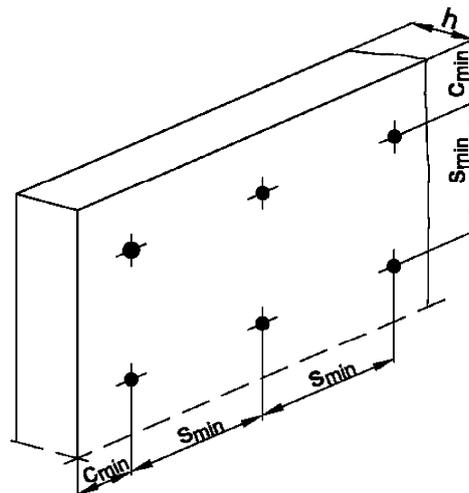
Table B1: Installation parameters

| | | | |
|--|------------------|--------------|------|
| Anchor type | | ejothem S1 | |
| | | use category | |
| | | A, B, C, D | E |
| Drill hole diameter | d_0 [mm] = | 8 | 8 |
| Cutting diameter of drill bit | d_{cut} [mm] ≤ | 8,45 | 8,45 |
| Depth of drilled hole to deepest point | h_1 [mm] ≥ | 40 | 60 |
| Effective anchorage depth | h_{ef} [mm] ≥ | 30 | 50 |

Table B2: Anchor distances and dimensions of members

| | | | |
|-----------------------------|---------------------|------------|--|
| Anchor type | | ejothem S1 | |
| Minimum spacing | $s_{min} \geq$ [mm] | 100 | |
| Minimum edge distance | $c_{min} \geq$ [mm] | 100 | |
| Minimum thickness of member | $h \geq$ [mm] | 100 | |

Scheme of distance and spacing



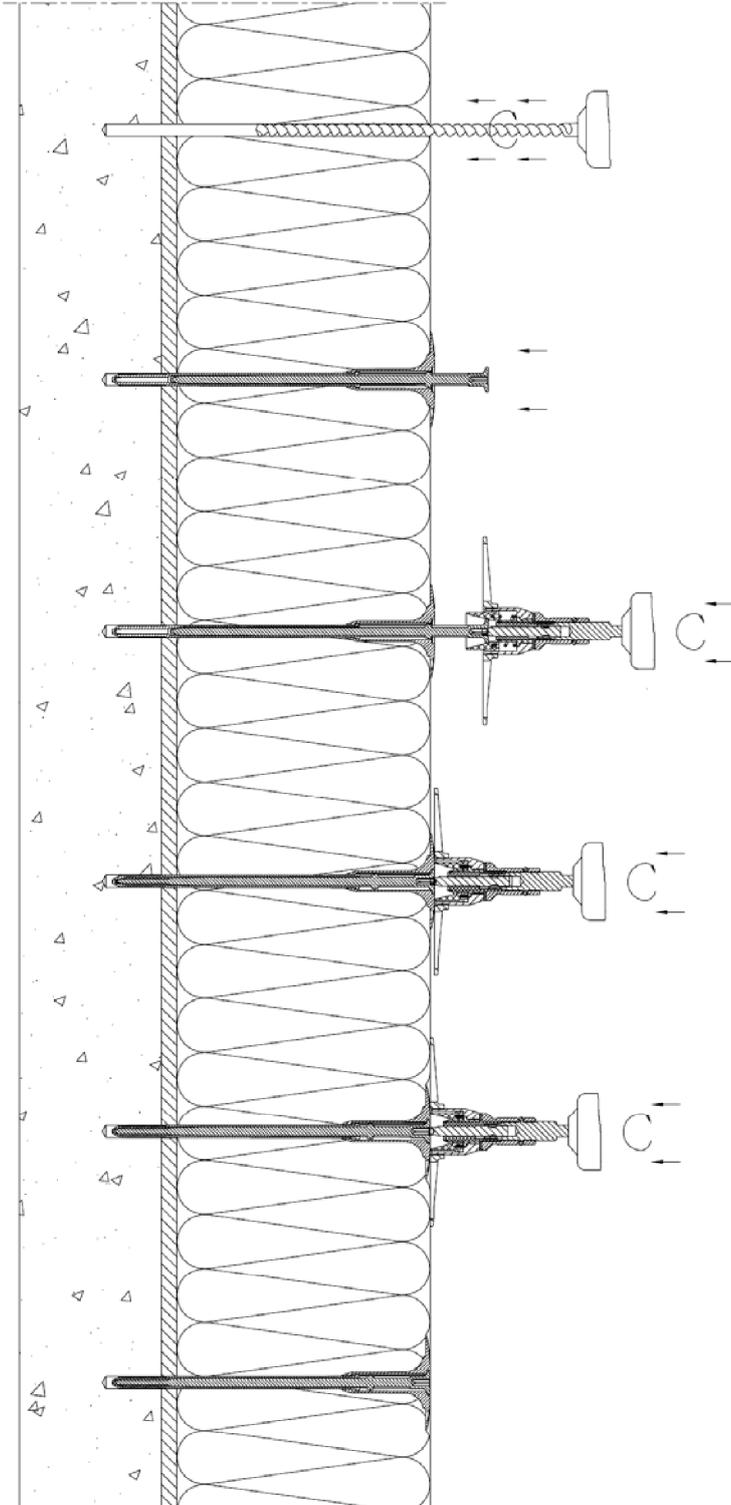
ejothem S1

Intended use

Installations parameters,
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 insulation.

Placing the mounting tool on the dowel screw

Mounting the screw

Top side of the anchor plate mounted flush with the insulation board surface. Assembly tool decoupled.

Installed conditions ejothem S1

ejothem S1

Intended use
Installation instructions

Annex B 3

| Table C1: Characteristic resistance to tension loads N_{Rk} in concrete and masonry for a single anchor in kN | | | | | |
|---|---|---|---|--------------|-------------------|
| Anchor type | | | | | ejothem S1 |
| 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 C12/15 – C50/60 EN 206-1:2000 | | | | hammer | 1,5 |
| Thin concrete members (e.g. weather resistant skin) Concrete C16/20 – C50/60 EN 206-1:2000 | | | Thickness of the thin skin: 100 mm > h ≥ 40 mm | hammer | 1,4 |
| Clay bricks, Mz EN 771-1:2011 | ≥ 1,8 | 12 | Vertically perforation up to 15 %. | hammer | 1,5 |
| Sand-lime solid bricks, KS EN 771-2:2011 | ≥ 1,8 | 12 | Vertically perforation up to 15 %. | hammer | 1,5 |
| Vertically perforated clay bricks, HLz EN 771-1:2011 | ≥ 1,6 | 20 | Vertically perforation > 15 % and ≤ 50 %. | hammer | 1,5 ¹⁾ |
| Sand-lime perforated bricks, KSL EN 771-2:2011 | ≥ 1,6 | 12 | Vertically perforation > 15 % and ≤ 50 %. | hammer | 1,5 ²⁾ |
| Lightweight concrete hollow blocks, Hbl EN 771-3:2011 | ≥ 1,2 | 7 | | hammer | 0,9 ³⁾ |
| lightweight aggregate concrete LAC 4 – LAC 25 EN 1520:2011 / EN 771-3:2011 | ≥ 0,7 | 7 | | rotary | 0,9 |
| Autoclaved aerated concrete AAC 4 – AAC 7 EN 771-4:2011 | ≥ 0,55 | 6 | | rotary | 0,75 |
| ejothem S1 | | | | | Annex C 1 |
| Performances Characteristic resistance | | | | | |

¹⁾ The value applies only for outer web thickness ≥ 25 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.

³⁾ The value applies only for outer web thickness ≥ 40 mm; otherwise the characteristic resistance shall be determined by job site pull-out tests.

Table C2: Point thermal transmittance according EOTA Technical Report TR 025:2016-05

| anchor type | insulation thickness h_D [mm] | point thermal transmittance χ [W/K] |
|-------------|---------------------------------------|--|
| ejothem S1 | 80 – 460 | 0 |

Table C3: Plate stiffness according EOTA Technical Report TR 026:2016-05

| anchor type | diameter of the anchor plate [mm] | load resistance of the anchor plate [mm] | plate stiffness [kN/mm] |
|-------------|---|--|----------------------------|
| ejothem S1 | 60 | 1,5 | 0,7 |

Table C4: Displacements

| Base materials | Bulk density class ρ [kg/dm ³] | minimum compressive strength f_b [N/mm ²] | Tension load N [kN] | Displacements $\delta(N)$ [mm] | |
|---|---|---|------------------------------|--------------------------------------|-------------------------|
| | | | | $L_a =$ 100 - 300 mm | $L_a =$ 320 - 460 mm |
| Concrete C12/15 – C50/60 EN 206-1:2000 | | | 0,5 | 0,6 | 0,9 |
| Thin concrete members (e.g. weather resistant skin) Concrete C16/20 – C50/60 EN 206-1:2000 | | | 0,45 | 0,6 | 0,9 |
| Clay bricks, Mz EN 771-1:2011 | $\geq 1,8$ | 12 | 0,5 | 0,6 | 0,9 |
| Sand-lime solid bricks, KS EN 771-2:2011 | $\geq 1,8$ | 12 | 0,5 | 0,6 | 0,9 |
| Vertically perforated clay bricks, HLz EN 771-1:2011 | $\geq 1,6$ | 20 | 0,5 | 0,6 | 0,9 |
| Sand-lime perforated bricks, KSL EN 771-2:2011 | $\geq 1,6$ | 12 | 0,5 | 0,6 | 0,9 |
| Lightweight concrete hollow blocks, Hbl EN 771-3:2011 | $\geq 1,2$ | 7 | 0,3 | 0,4 | 0,6 |
| lightweight aggregate concrete LAC 4 – LAC 25 EN 1520:2011 / EN 771-3:2011 | $\geq 0,7$ | 7 | 0,3 | 0,4 | 0,6 |
| Autoclaved aerated concrete AAC 4 – AAC 7 EN 771-4:2011 | $\geq 0,55$ | 6 | 0,25 | 0,3 | 0,4 |

ejothem S1

Performances
Point thermal transmittance, plate stiffness, displacements

Annex C 2