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-17/0991 of 3 December 2021

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	ejotherm S1 and ejotherm S1 short
Product family to which the construction product belongs	Screwed-in plastic anchor for fixing of external thermal insulation composite systems with rendering in conrete 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	18 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, Edition 10/2017
This version replaces	ETA-17/0991 issued on 19 January 2021

Deutsches Institut für Bautechnik
Kolonnenstraße 30 B | 10829 Berlin | GERMANY | Phone: +49 30 78730-0 | Fax: +49 30 78730-320 | Email: dibt@dibt.de | www.dibt.de

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Specific Part

1 Technical description of the product

The screwed-in anchor ejotherm S1 and ejotherm S1 short 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 load bearing capacity - Characteristic resistance under tension load - Minimum edge distance and spacing	 See Annex C 1 See Annex B 2
Displacements	See Annex C 2
Plate stiffness	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.

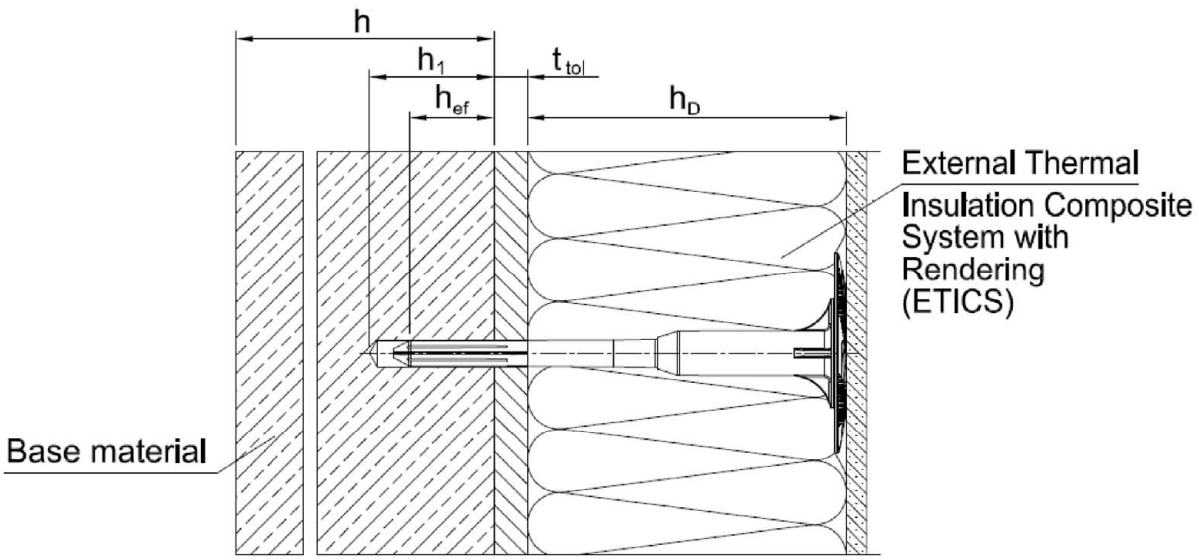
Issued in Berlin on 3 December 2021 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

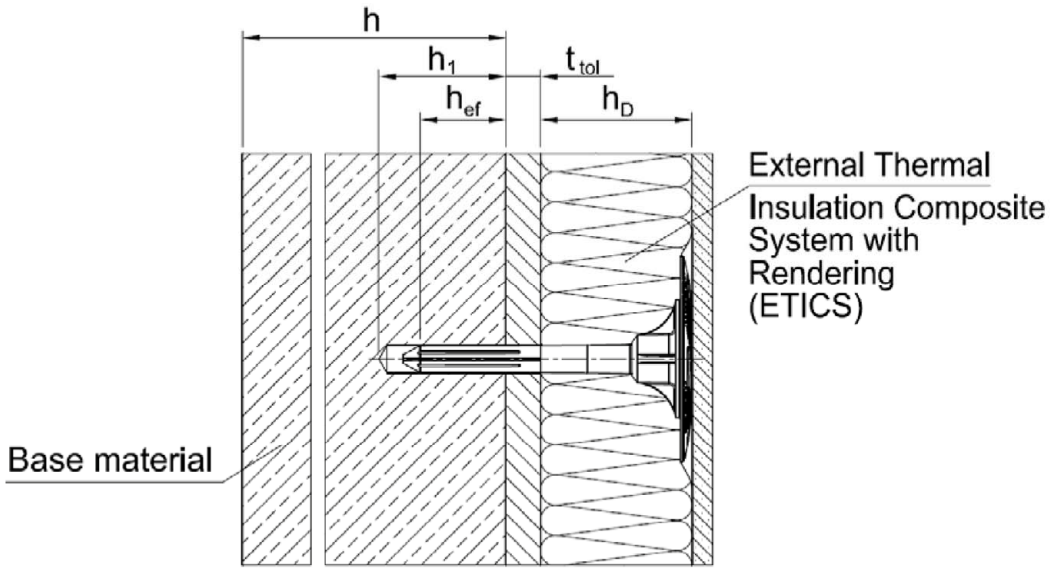
beglaubigt:
Ziegler

Deutsches Institut für Bautechnik DIBt

ejotherm S1



ejotherm S1 short



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 and ejotherm S1 short	**Annex A 1**
Product description Installed condition	

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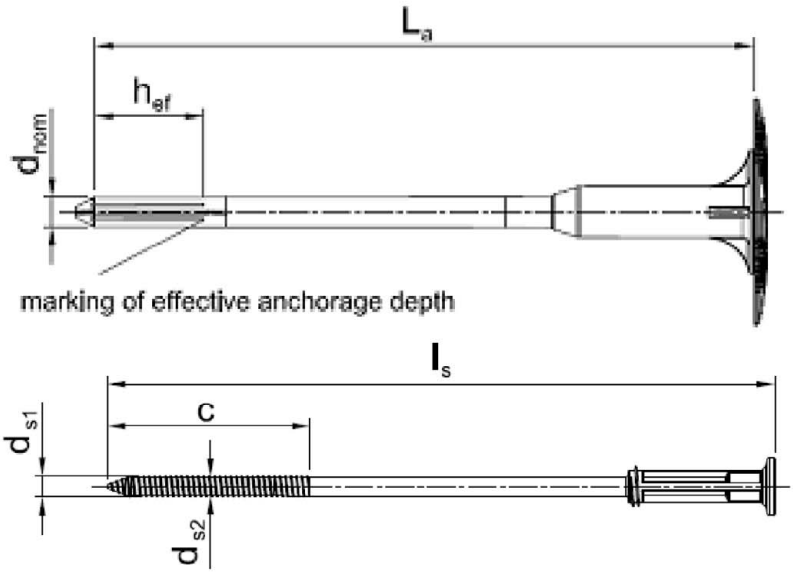
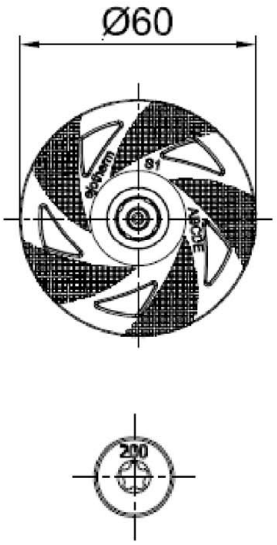
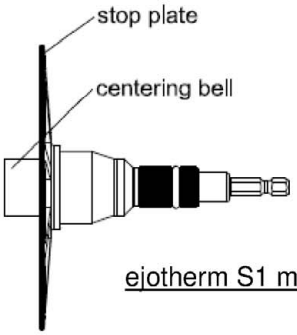
ejotherm S1 in base material group A, B, C, D







ejotherm S1 mounting tool

Marking:
Identifying mark (ejotherm)
Anchor type (S1)
Base material group (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 and ejotherm S1 short

Annex A 2

Product description
Marking and dimension of the anchor sleeve from ejotherm S1;
base material group: A, B, C, D; plastic screw

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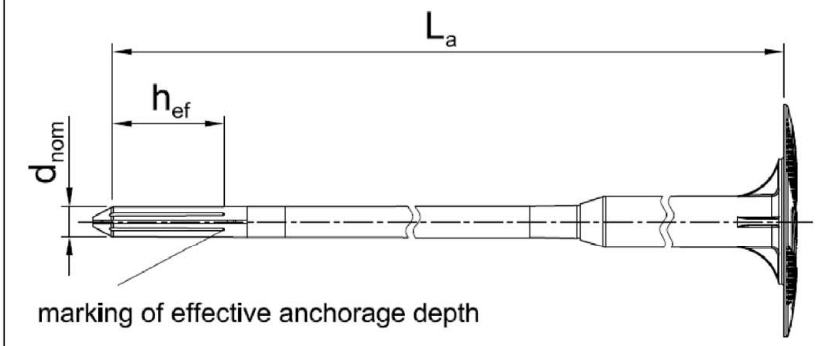
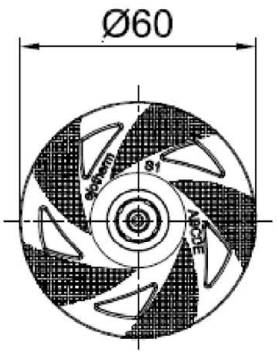
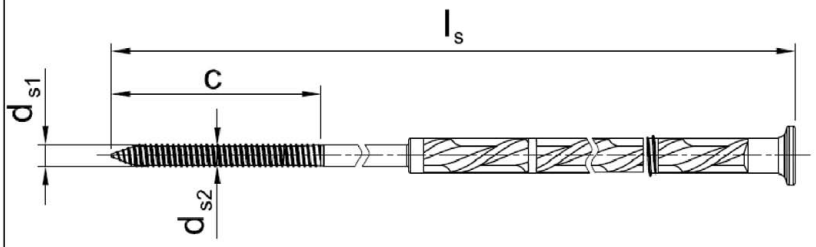
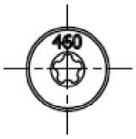
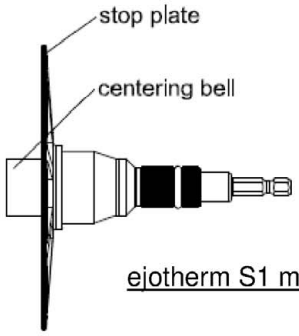
ejotherm S1 in base material group A, B, C, D – large version











ejotherm S1 mounting tool

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

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:

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

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

$h_{Dmax} = 420$

ejotherm S1 and ejotherm S1 short

Annex A 3

Product description
Marking and dimension of the anchor sleeve ejotherm S1- large version;
base material group: A, B, C, D; plastic screw

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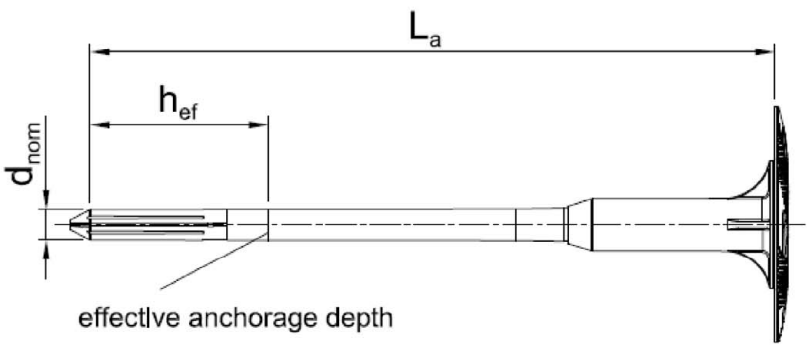
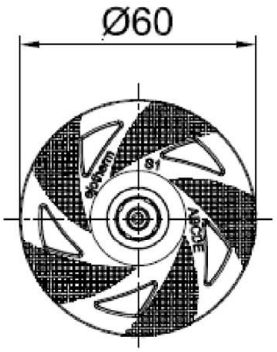
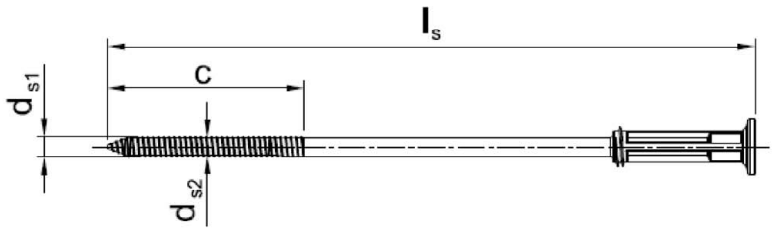
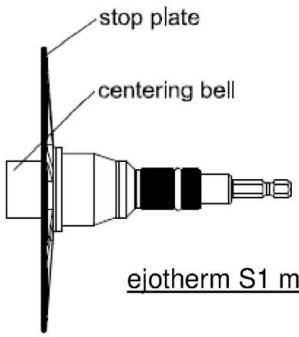
ejotherm S1 in base material group E









ejotherm S1 mounting tool

Marking:
Identifying mark (ejotherm)
Anchor type (S1)
Base material group (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 and ejotherm S1 short	**Annex A 4**
Product description Marking and dimension of the anchor sleeve ejotherm S1; base material group: E; plastic screw	

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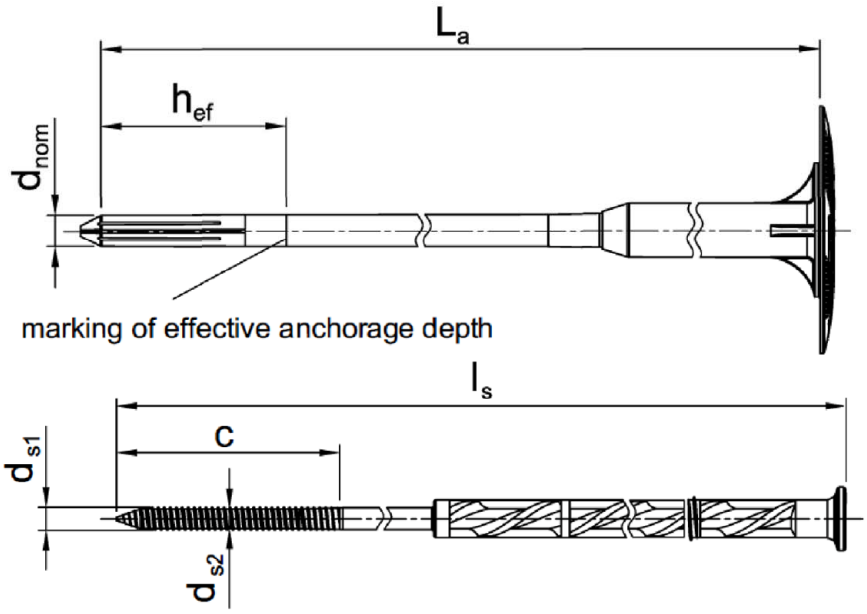
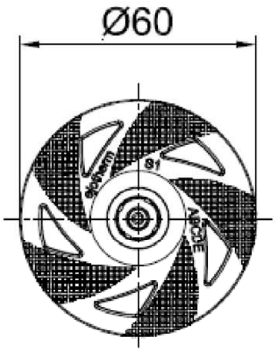
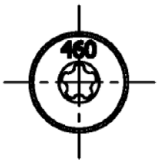
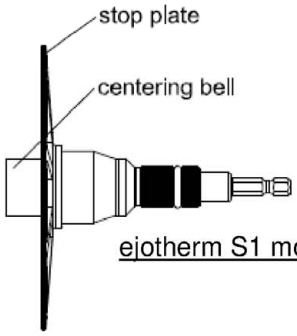
ejotherm S1 in base material group E – large version









ejotherm S1 mounting tool

Marking:
Identifying mark (ejotherm)
Anchor type (S1)
Base material group (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 and ejotherm S1 short	**Annex A 5**
Product description Marking and dimension of the anchor sleeve ejotherm S1- large version; base material group: E; plastic screw	

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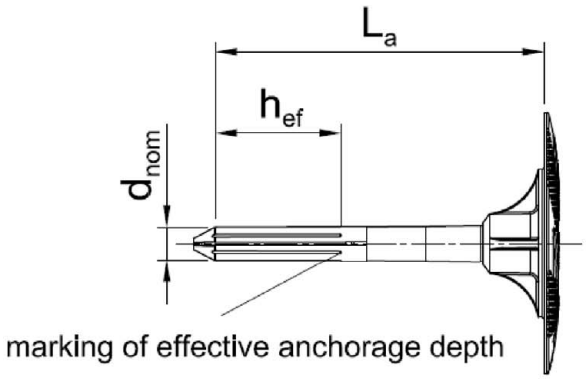
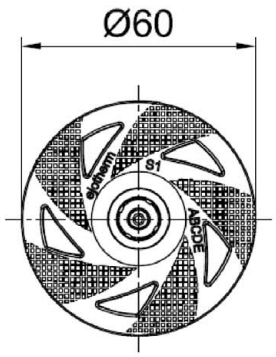
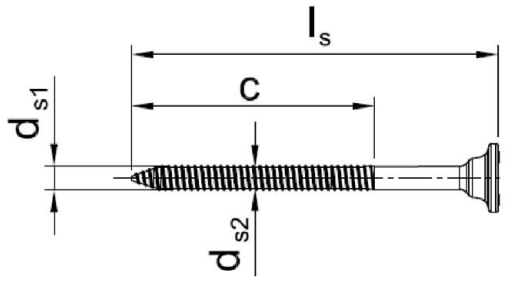
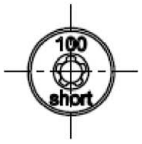
ejotherm S1 short in base material group A, B, C, D

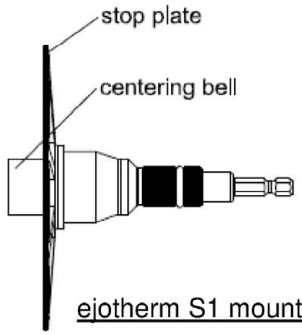








Marking:
Identifying mark (ejotherm)
Anchor type (S1)
Base material group (A, B, C, D, E)
Length of anchor (e.g. 100)
Marking (short)



ejotherm S1 mounting tool

Table A5: 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 short	8	30	60 100	5,7	5,0	55	65 105

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

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

e.g. $h_D = 60 - 10 - 30$

$h_{Dmax} = 20$

ejotherm S1 and ejotherm S1 short	**Annex A 6**
Product description Marking and dimension of the anchor sleeve ejotherm S1 short; base material group: A, B, C, D; plastic screw	

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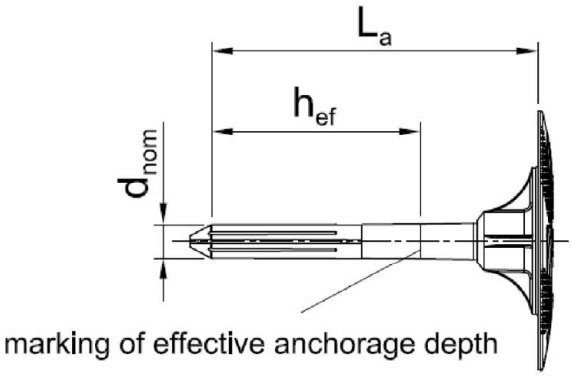
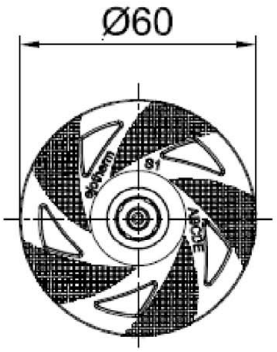
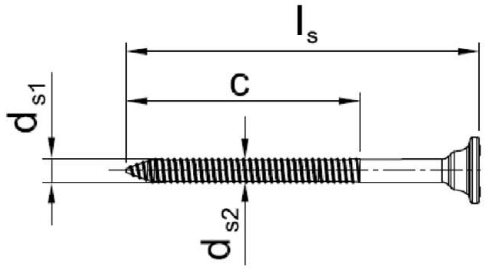
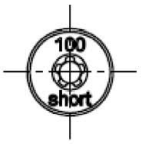
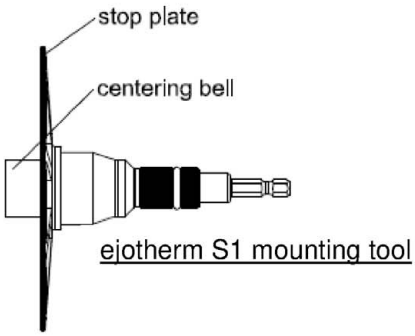
ejotherm S1 short in base material group E











Marking:
Identifying mark (ejotherm)
Anchor type (S1)
Base material group (A, B, C, D, E)
Length of anchor (e.g. 100)
Marking (short)

Table A6: 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 short	8	50	80 100	5,7	5,0	55	85 105

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

$h_D = L_a - t_{tol} - h_{ef}$
e.g. $h_D = 80 - 10 - 50$
$h_{Dmax} = 20$

ejotherm S1 and ejotherm S1 short	**Annex A 7**
Product description Marking and dimension of the anchor sleeve ejotherm S1 short; base material group: E; plastic screw	

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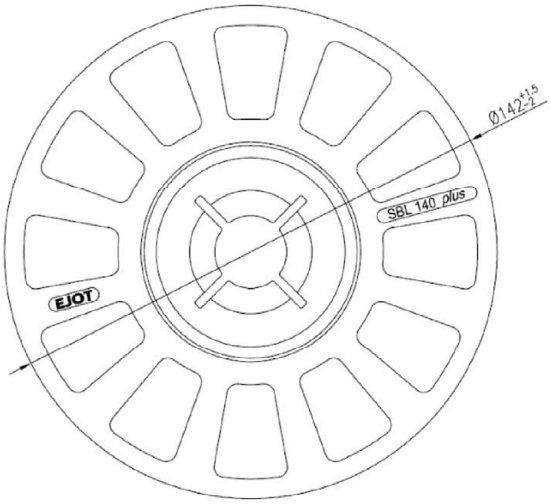
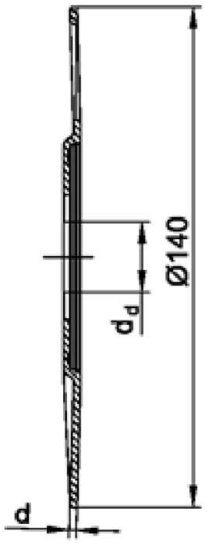
Table A7: Materials ejotherm S1 / ejotherm S1 short	
Anchor plate	Polyethylene (virgin material) PE-HD nature, yellow, orange, red, blue, grey, white, green, anthracite
Anchor sleeve	Polyethylene (virgin material) PE-HD nature, yellow, orange, red, blue, grey, white, green, anthracite
Plastic screw	Polyamide (virgin material) PA 6 GF 50 colour: nature, black

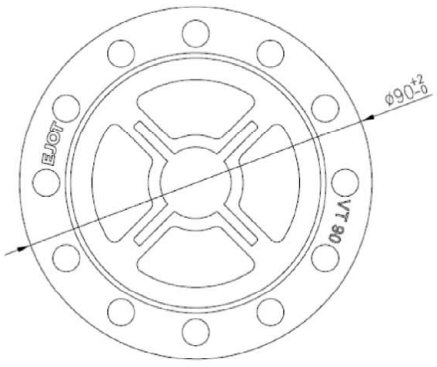
SBL 140 *plus*

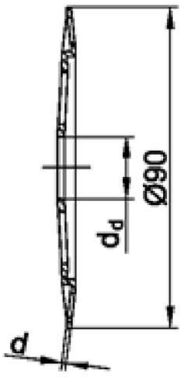




SBL 140 plus	
colour	nature
d_d [mm]	21,0
d [mm]	2,0
Material	1) 2)

VT 90





VT 90	
colour	nature
d_d [mm]	18,5
d [mm]	1,2
Material	1) 2)

1) polyamide, PA 6
2) polyamide, PA GF 50

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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:

- Compacted normal weight concrete without fibres (base material group A) according to Annex C 1.
- Solid masonry (base material group B), according to Annex C 1.
- Hollow or perforated masonry (base material group C), according to Annex C 1.
- Prefabricated reinforced components of lightweight aggregate concrete (LAC) (base material group D), according to Annex C 1.
- Autoclaved aerated concrete (base material group E), according to Annex C 1.
- For other base materials of base material groups 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 April 2018.

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 γ_m = 2,0 and γ_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 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

ejotherm S1 and ejotherm S1 short	**Annex B 1**
Intended use Specifications	

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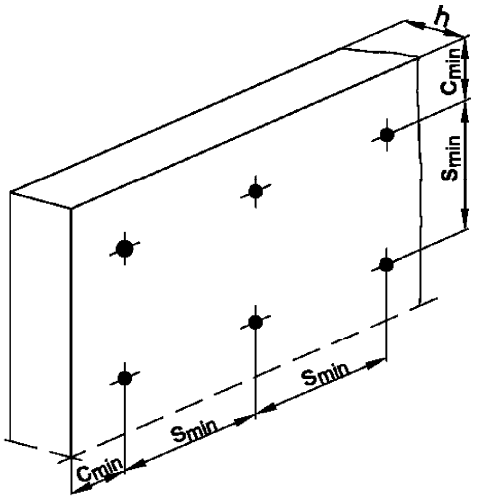
Table B1: Installation parameters			
Anchor type		ejotherm S1 / ejotherm S1 short	
		Base material group	
		A, B, C, D	E
Drill hole diameter	d_0 [mm] =	8	8
Cutting diameter of drill bit	d_{cut} [mm] ≤	8,45	8,45
Depth of drilled hole to deepest point	h_1 [mm] ≥	40	60
Effective anchorage depth	h_{ef} [mm] ≥	30	50

Table B2: Anchor distances and dimensions of members		
Anchor type		ejotherm S1 / ejotherm S1 short
Minimum spacing	s_{min} ≥ [mm]	100
Minimum edge distance	c_{min} ≥ [mm]	100
Minimum thickness of member	h ≥ [mm]	100

Scheme of distance and spacing



ejotherm S1 and ejotherm S1 short	**Annex B 2**
Intended use Installations parameters, Edge distances and spacing	

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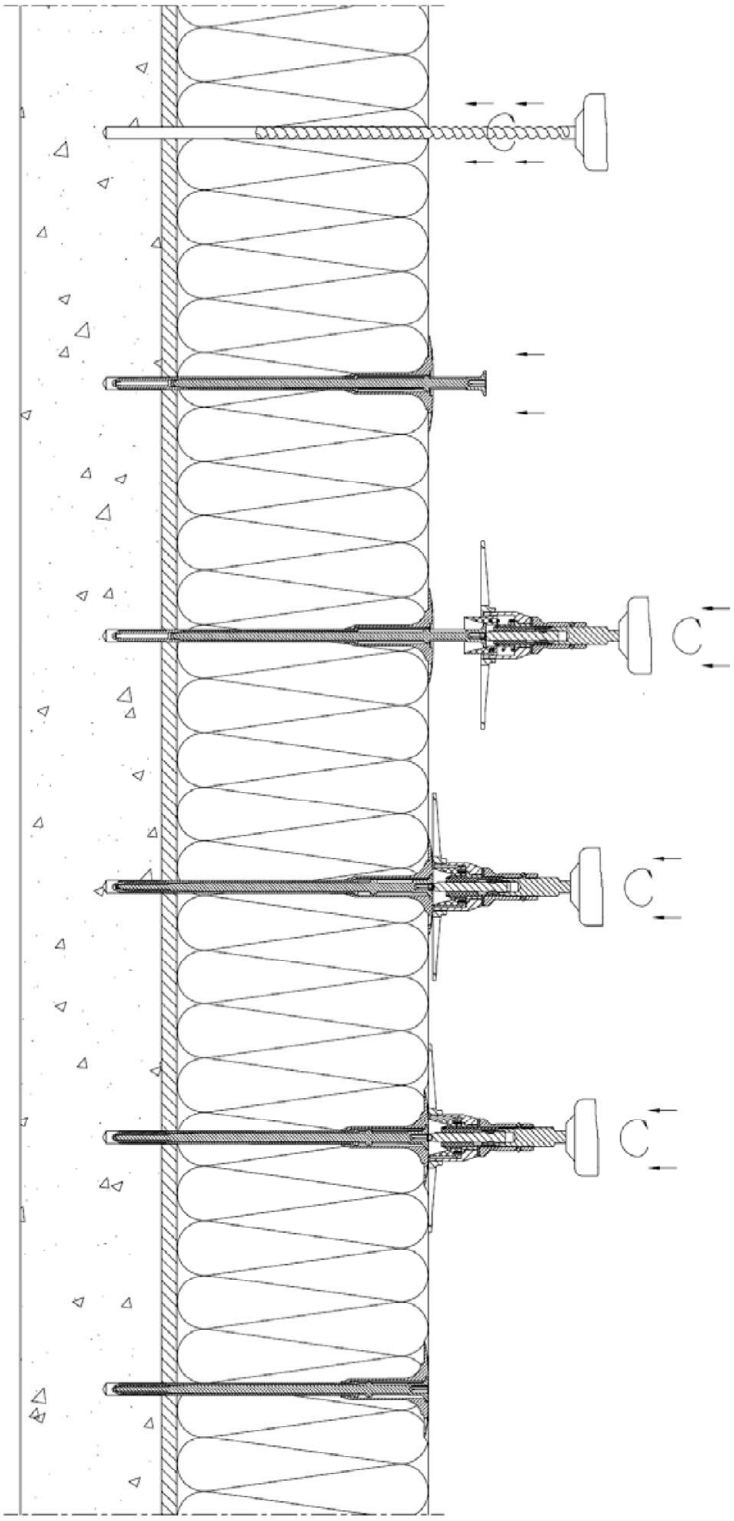
Installation instructions: ejotherm S1



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 ejotherm S1

ejotherm S1 and ejotherm S1 short	**Annex B 3**
Intended use Installation instructions ejotherm S1	

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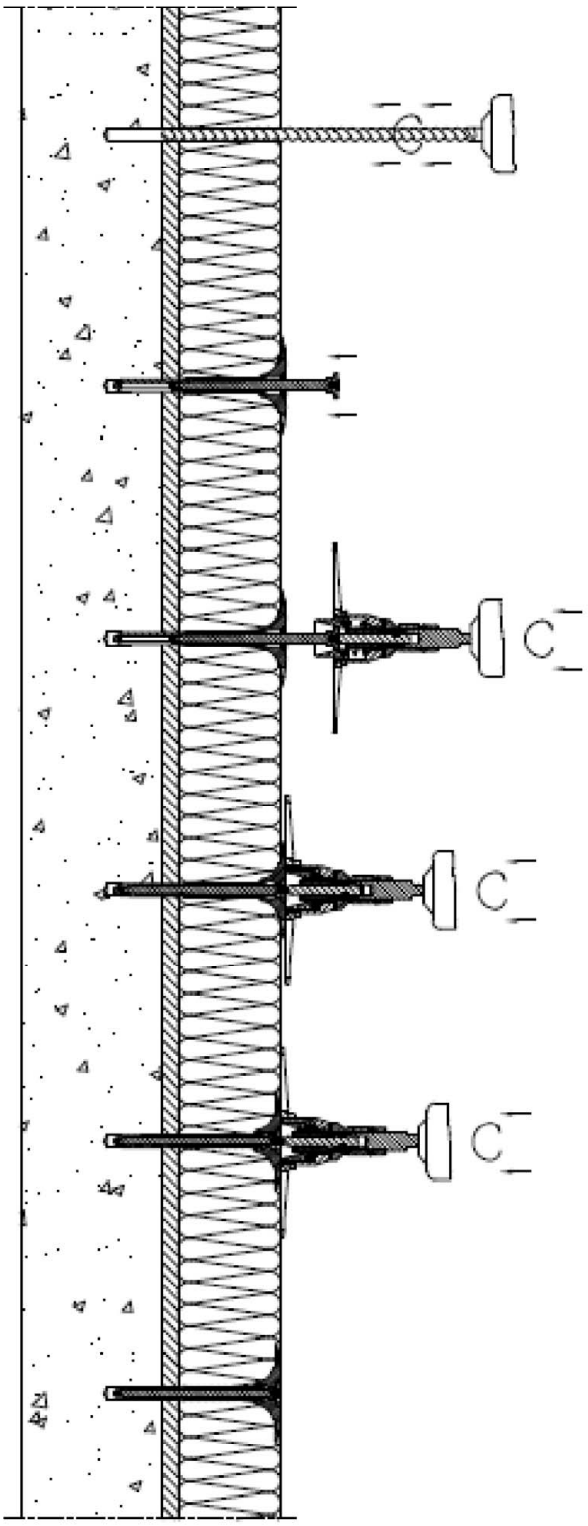
Installation instructions: ejotherm S1 short



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 ejotherm S1

ejotherm S1 and ejotherm S1 short	**Annex B 4**
Intended use Installation instructions, ejotherm S1 short	

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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					ejotherm S1	ejotherm S1 short
Base materials	Bulk density ρ [kg/dm³]	Minimum compressive strength f_b [N/mm²]	General remarks	Drill method	N_{Rk} [kN]	N_{Rk} [kN]
Concrete C12/15 – C50/60 as per EN 206:2013+A1:2016			Compacted normal weight concrete without fibres	hammer	1,5	1,5
Thin concrete members (e.g. weather resistant skin) Concrete C16/20 – C50/60 as per EN 206:2013+A1:2016			Compacted normal weight concrete without fibres Thickness of the thin skin: 100 mm > h ≥ 40 mm	hammer	1,4	1,4
Clay bricks, Mz as per EN 771-1:2011+A1:2015	≥ 1,8	12	Vertically perforation[4] up to 15 %.	hammer	1,5	1,5
Sand-lime solid bricks, KS as per EN 771-2:2011+A1:2015	≥ 1,8	12	Vertically perforation[4] up to 15 %.	hammer	1,5	1,5
Vertically perforated clay bricks, HLz as per EN 771-1:2011+A1:2015	> 1,6	20	Vertically perforation[4] > 15 % and ≤ 50 %.	hammer / rotary	1,5[1]	1,5[1]
Sand-lime perforated bricks, KSL as per EN 771-2:2011+A1:2015	≥ 1,6	12	Vertically perforation[4] > 15 % and ≤ 50 %.	hammer / rotary	1,5[2]	1,5[2]
Lightweight concrete hollow blocks, Hbl as per EN 771-3:2011+A1:2015	≥ 1,2	6		hammer / rotary	0,9[3]	0,9[3]
lightweight aggregate concrete, LAC as per EN 1520:2011, EN 771-3:2011+A1:2015	≥ 0,7	4		rotary	0,9	0,9
Autoclaved aerated concrete as per EN 771-4:2011 +A1:2015	≥ 0,55	4		rotary	0,75	0,75

[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.
[4] Cross section reduced by perforation vertically to the resting area

ejotherm S1 and ejotherm S1 short	**Annex C 1**
Performances Characteristic resistance	

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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]
ejotherm S1	60	0,001
ejotherm S1	80 – 460	0,000
ejotherm S1 short	20	0,002
ejotherm S1 short	40 – 60	0,001

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 [kN]	plate stiffness [kN/mm]
ejotherm S1	60	1,5	0,7
ejotherm S1 short	60	1,5	0,7

Table C4: Displacements ejotherm S1 / ejotherm S1 short					
Base materials	Bulk density ρ [kg/dm³]	minimum compressive strength f_b [N/mm²]	Tension load N [kN]	Displacements $\Delta\delta_N$ [mm]	
				L_a = 60 – 300 mm	L_a = 320 – 460 mm
Concrete C12/15 – C50/60 (EN 206:2013+A1:2016)			0,5	0,6	0,9
Thin concrete members (e.g. weather resistant skin) Concrete C16/20 – C50/60 (EN 206:2013+A1:2016)			0,45	0,6	0,9
Clay bricks, Mz (EN 771-1:2011+A1:2015)	≥ 1,8	12	0,5	0,6	0,9
Sand-lime solid bricks, KS (EN 771-2:2011+A1:2015)	≥ 1,8	12	0,5	0,6	0,9
Vertically perforated clay bricks, HLz (EN 771-1:2011+A1:2015)	≥ 1,6	20	0,5	0,6	0,9
Sand-lime perforated bricks, KSL (EN 771-2:2011+A1:2015)	≥ 1,6	12	0,5	0,6	0,9
Lightweight concrete hollow blocks, Hbl (EN 771-3:2011+A1:2015)	≥ 1,2	6	0,3	0,4	0,6
Lightweight aggregate concrete, LAC (EN 1520:2011 / EN 771-3:2011+A1:2015)	≥ 0,7	4	0,3	0,4	0,6
Autoclaved aerated concrete EN 771-4:2011+A1:2015)	≥ 0,55	4	0,25	0,3	0,4

ejotherm S1 and ejotherm S1 short

Annex C 2

Performances
Point thermal transmittance, plate stiffness, displacements