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-04/0023 of 17 October 2017

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 STR U, ejotherm STR U 2G and ejotherm SDK U
Product family to which the construction product belongs	Screwed-in 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
Manufacturing plant	EJOT 1 EJOT 2 EJOT 3 EJOT 4
This European Technical Assessment contains	23 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

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Specific part

1 Technical description of the product

The EJOT screwed-in anchor type ejotherm STR U and ejotherm STR U 2G with a plate consists of a plastic part made of virgin polyethylene, an accompanying specific screw made of stainless steel or galvanised steel and an anchor cap made of polystyrene (for mounting the anchor on the surface of the insulating material) or an insulation cover made of polystyrene or mineral wool (for deep mounting of the anchor in the insulating material).

The ejotherm STR U 2G differs in the following points from the anchor system ejotherm STR U as follows:

- The anchor bolt is double-threaded.
- The length of the upper shaft region increases with different length of the anchor.

For mounting on the surface the anchor may additionally be combined with the anchor plates SBL 140 plus, VT 90 or VT 2G, made of polyamide.

The EJOT screwed-in anchor type ejotherm SDK U with a collar consists of a plastic part made of virgin polyethylene and an accompanying specific screw of stainless steel or galvanised steel.

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 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 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 3

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 EAD

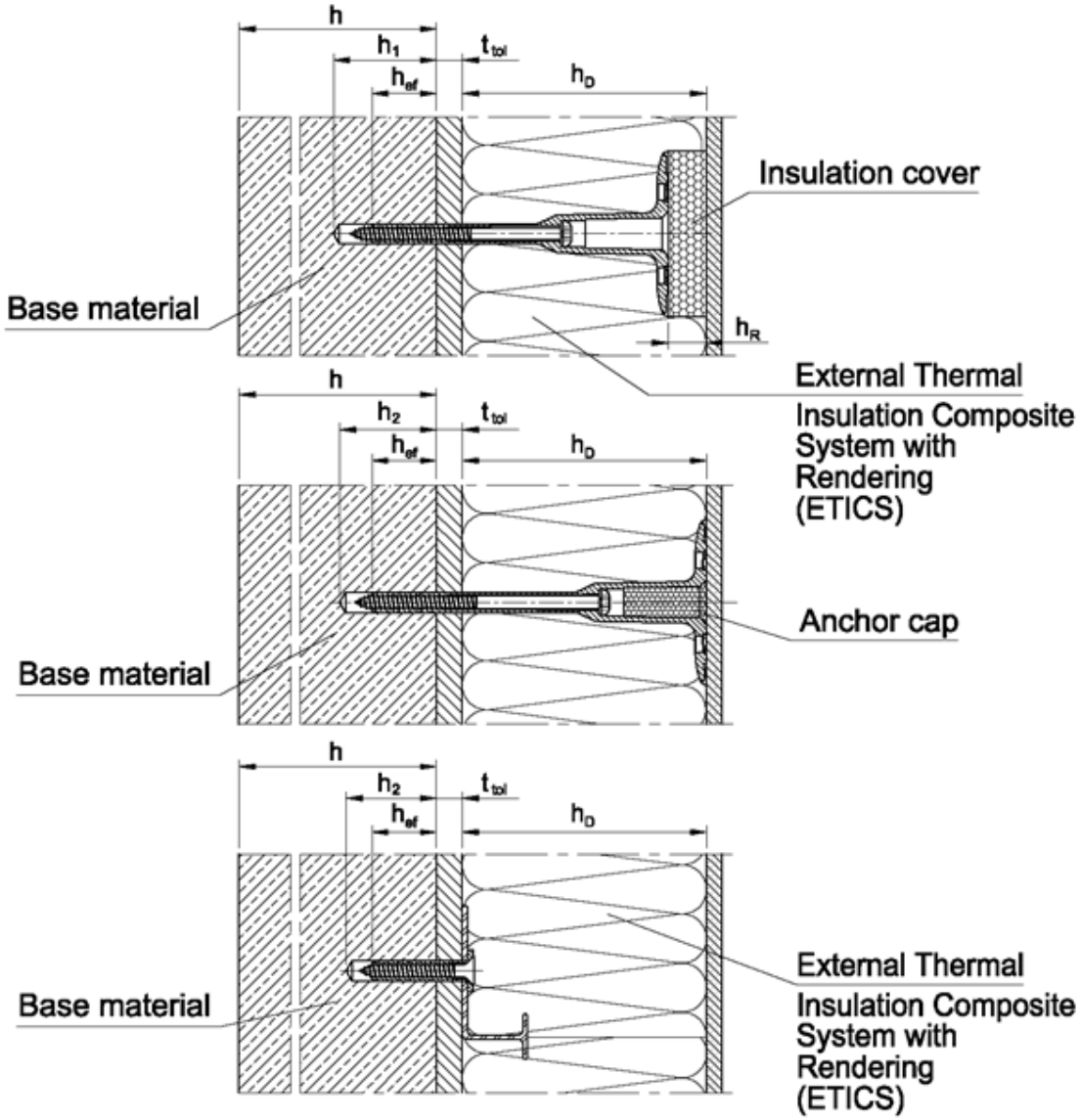
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 17 October 2017 by Deutsches Institut für Bautechnik

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

beglaubigt:
Ziegler

ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U



Intended use

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

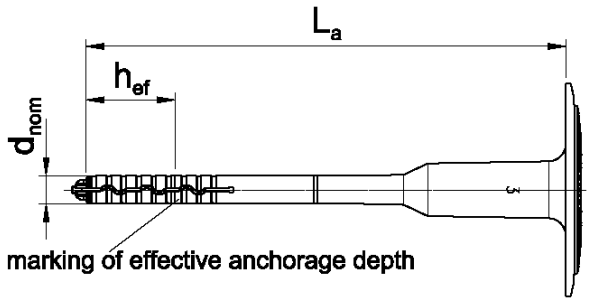
Legend:

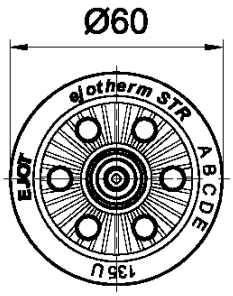
h_D	=	thickness of insulation material
h_{ef}	=	effective anchorage depth
h	=	thickness of member (wall)
$h_{1,2}$	=	depth of drilled hole to deepest point
h_R	=	thickness of insulation cover
t_{tol}	=	thickness of equalizing layer or non-load-bearing coating

ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U	Annex A 1
Product description Installed condition	

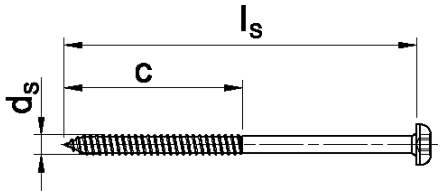
Deutsches Institut für Bautechnik DIBt

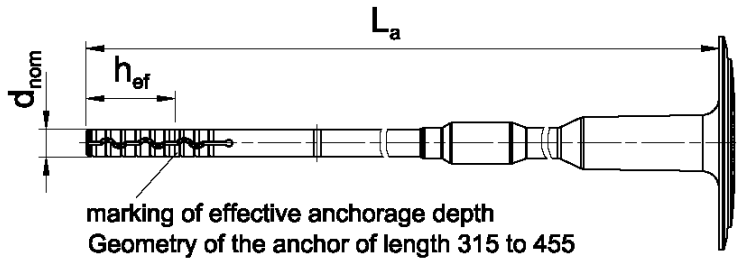
Components for deep mounting in use category A, B, C, D



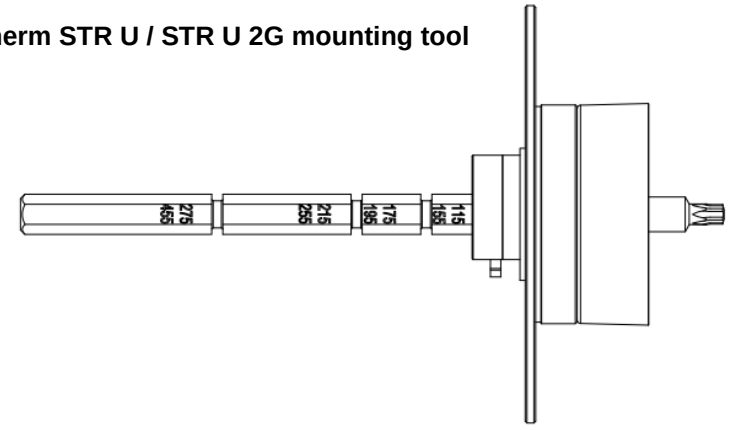


Marking:
Identifying mark (EJOT)
Anchor type (ejotherm STR U)
Length of anchor (e.g. 135)
Use category (A,B,C,D, E)

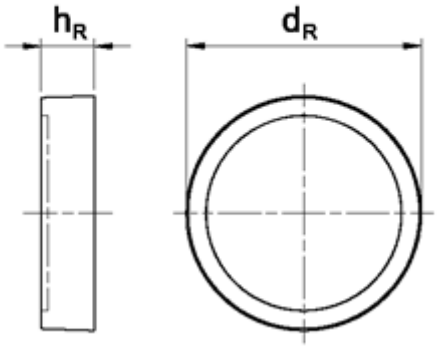




ejotherm STR U / STR U 2G mounting tool

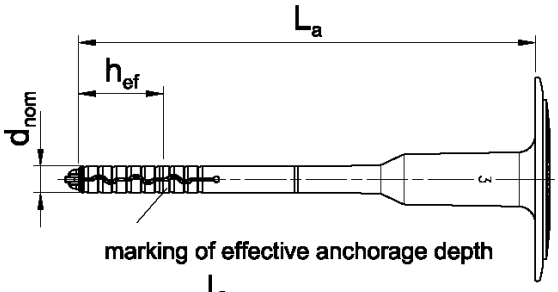


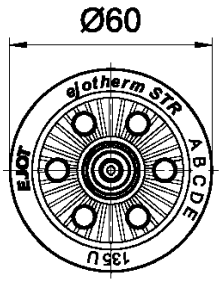
Insulation cover



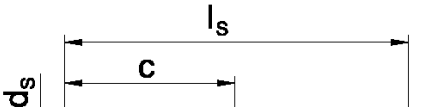
ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U	Annex A 2
Product description Components for deep mounting, ejotherm STR U, use category A,B,C,D	

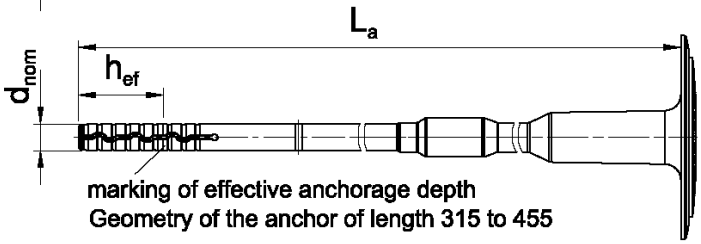
Components for mounting on the surface in use category A, B, C, D



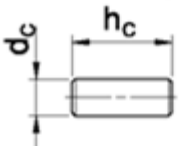


Marking:
Identifying mark (EJOT)
Anchor type (ejotherm STR U)
Length of anchor (e.g. 135)
Use category (A,B,C,D, E)

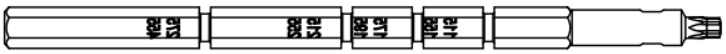


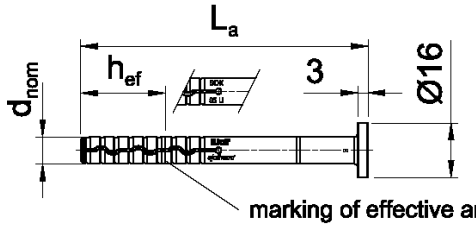


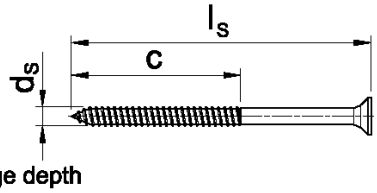
Anchor cap (to lock up the anchor in case of mounting on the surface)



ejotherm STR U / STR U 2G mounting tool







marking of effective anchorage depth

Marking:
Identifying mark (EJOT)
Anchor type (ejotherm SDK U)
Length of anchor (e.g. 85)

Table A1: Dimensions

Measures in mm

Anchor Type	Colour	Anchor sleeve				Accompanying specific screw				Anchor cap		Insulation cover	
		d_{nom}	h_{ef}	min L_a	max L_a	d_s	c	min l_s	max l_s	h_c	d_c	h_R	d_R
STR U	nature	8	25	115	455	5,5	60	78	418	23	15	15	66
SDK U	nature	8	25	45	125	5,5	60	50	130				

Determination of maximum thickness of insulation h_D for EJOT ejotherm STR U:

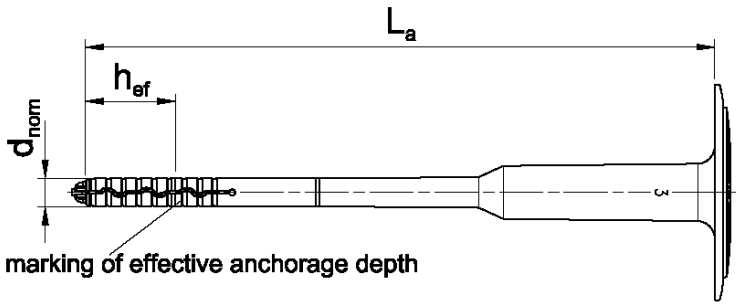
$h_D = L_a - t_{tol} - h_{ef}$ (L_a = e.g. 115; t_{tol} = 10)

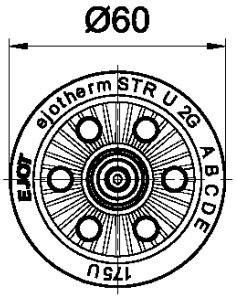
e.g. $h_D = 115 - 10 - 25$

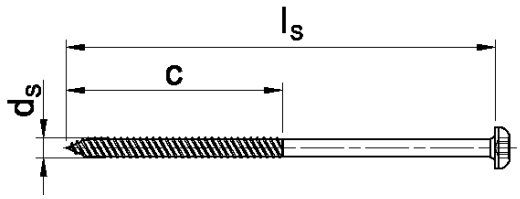
$h_{Dmax.} = 80$

ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U	Annex A 3
Product description Components for mounting on the surface, ejotherm STR U, SDK U use category A,B,C,D, dimensions	

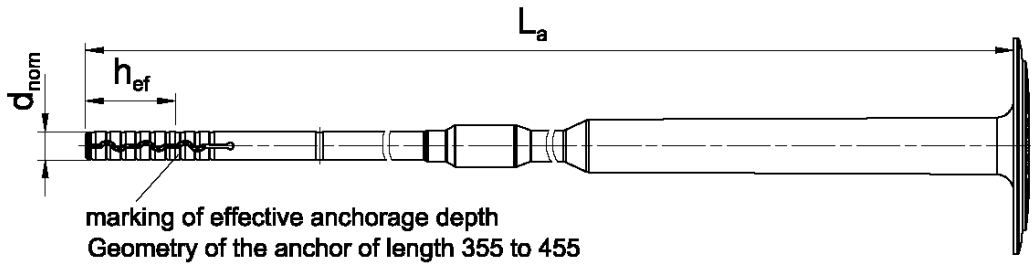
Components for deep mounting in use category A, B, C, D





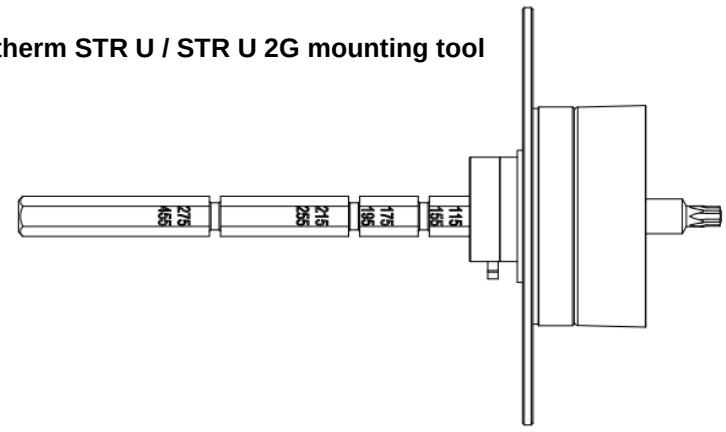


Marking:
Identifying mark (EJOT)
Anchor type (ejotherm STR U 2G)
Length of anchor (e.g. 175)
Use category (A,B,C,D, E)

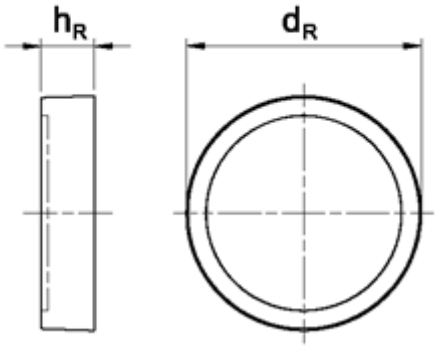


Geometry of the anchor of length 355 to 455

ejotherm STR U / STR U 2G mounting tool

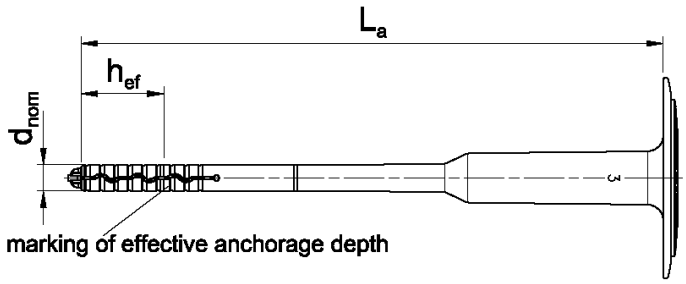


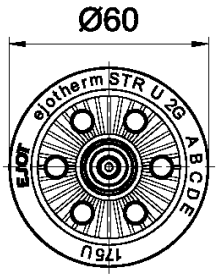
Insulation cover

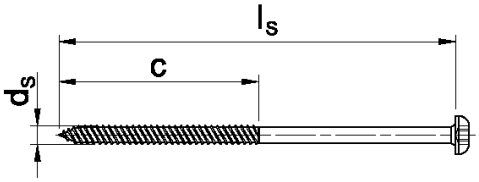


ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U	Annex A 4
Product description Components for deep mounting, ejotherm STR U 2G, use category A,B,C,D	

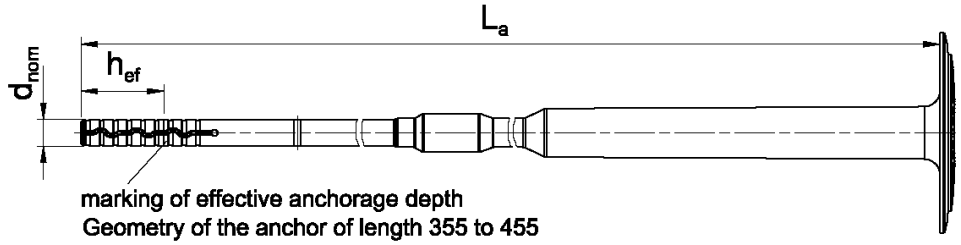
Components for mounting on the surface in use category A, B, C, D



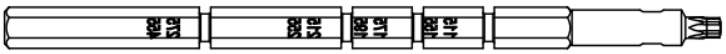




Marking:
Identifying mark (EJOT)
Anchor type (ejotherm STR U 2G)
Length of anchor (e.g. 175)
Use category (A,B,C,D, E)



ejotherm STR U / STR U 2G mounting tool



Anchor cap (to lock up the anchor in case of mounting on the surface)

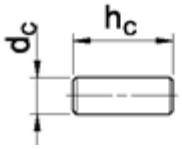


Table A2: Dimensions

Measures in mm

Anchor Type	Colour	Anchor sleeve				Accompanying specific screw				Anchor cap		Insulation cover	
		d_{nom}	h_{ef}	min L_a	max L_a	d_s	c	min l_s	max l_s	h_c	d_c	h_R	d_R
STR U 2G	nature	8	25	115	455	5,5	60	78	338	23	15	15	66

Determination of maximum thickness of insulation h_D for EJOT ejotherm STR U 2G:

$h_D = L_a - t_{tol} - h_{ef}$ (L_a = e.g. 115; t_{tol} = 10)

e.g. $h_D = 115 - 10 - 25$

$h_{Dmax.} = 80$

ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U	Annex A 5
Product description Components for mounting on the surface, ejotherm STR U 2G use category A,B,C,D, dimensions	

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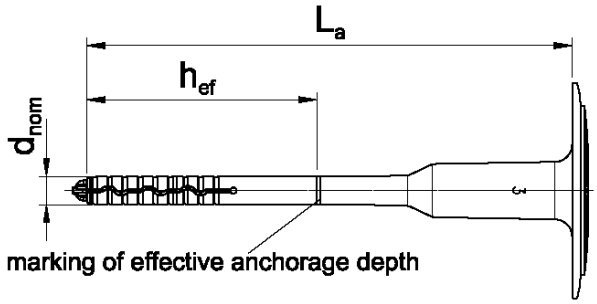
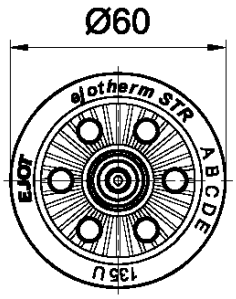
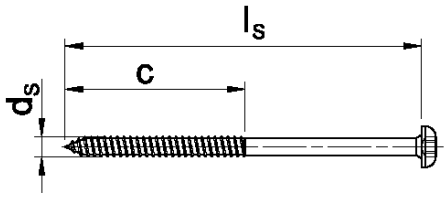
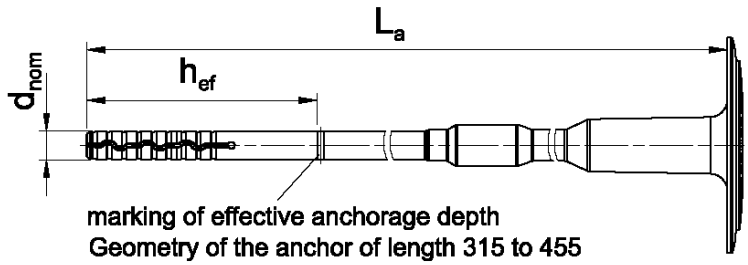
Components for deep mounting in use category E



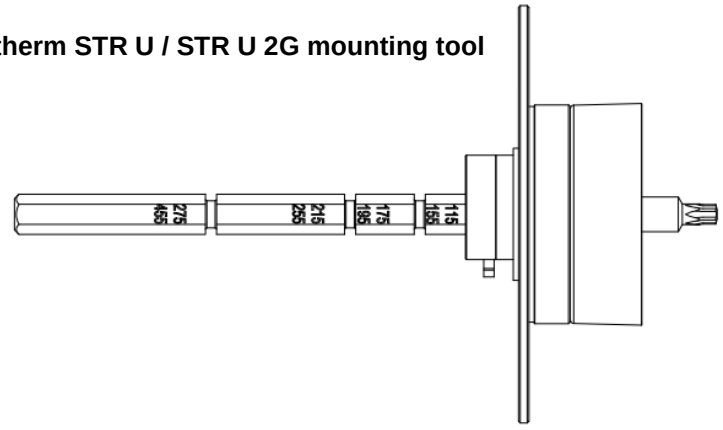


Marking:
Identifying mark (EJOT)
Anchor type (ejotherm STR U)
Length of anchor (e.g. 135)
Use category (A,B,C,D, E)

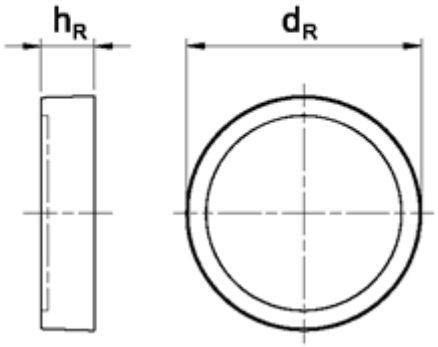




ejotherm STR U / STR U 2G mounting tool

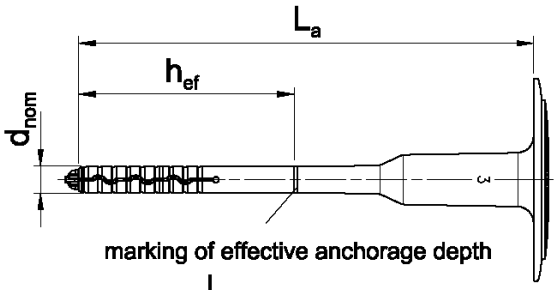


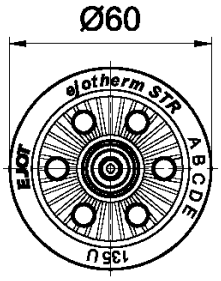
Insulation cover



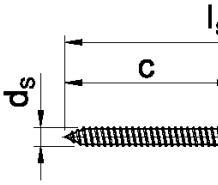
ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U	Annex A 6
Product description Components for deep mounting, ejotherm STR U, use category E	

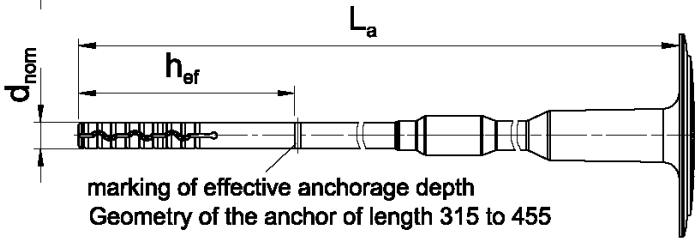
Components for mounting on the surface in use category E



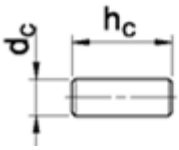


Marking:
Identifying mark (EJOT)
Anchor type (ejotherm STR U)
Length of anchor (e.g. 135)
Use category (A,B,C,D, E)

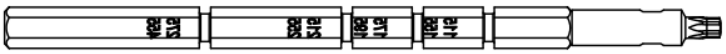


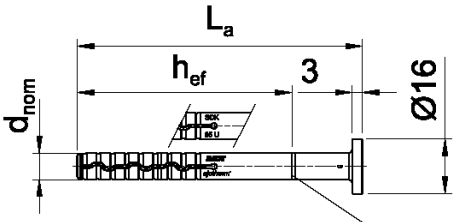


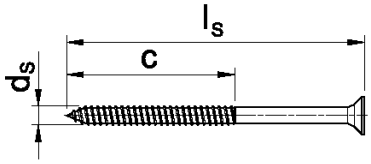
Anchor cap (to lock up the anchor in case of mounting on the surface)



ejotherm STR U / STR U 2G mounting tool







Marking:
Identifying mark (EJOT)
Anchor type (ejotherm SDK U)
Length of anchor (e.g. 85)

Table A3: Dimensions

Measures in mm

Anchor Type	Colour	Anchor sleeve				Accompanying specific screw				Anchor cap		Insulation cover	
		d_{nom}	h_{ef}	min L_a	max L_a	d_s	c	min l_s	max l_s	h_c	d_c	h_R	d_R
STR U	nature	8	65	115	455	5,5	60	78	418	23	15	15	66
SDK U	nature	8	65	45	125	5,5	60	50	130				

Determination of maximum thickness of insulation h_D for EJOT ejotherm STR U:

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

e.g. h_D = 155 – 10 – 65

$h_{Dmax.}$ = 80

ejotherm STR U, ejotherm STR U 2G
and ejotherm SDK U

Product description
Components for mounting on the surface, ejotherm STR U, SDK U
use category E, dimensions

Annex A 7

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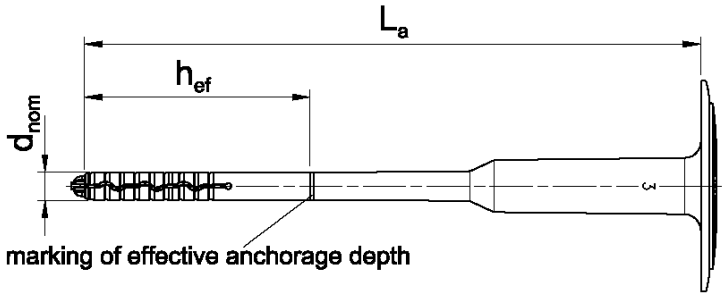
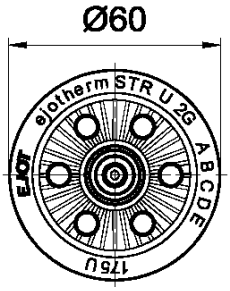
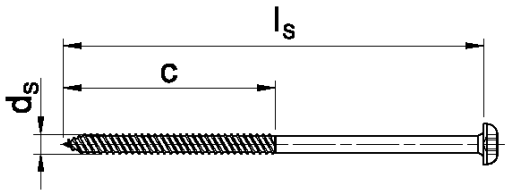
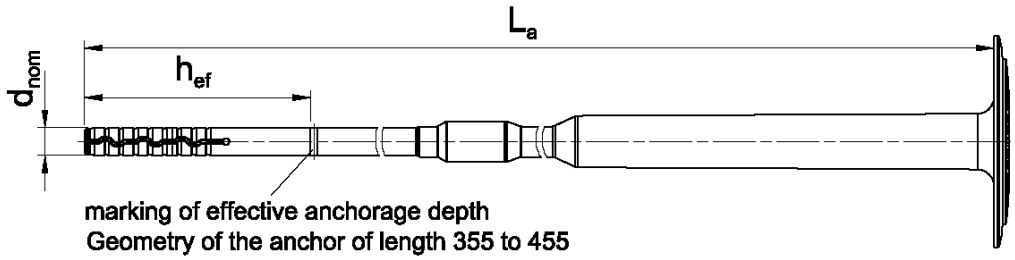
Components for deep mounting in use category E



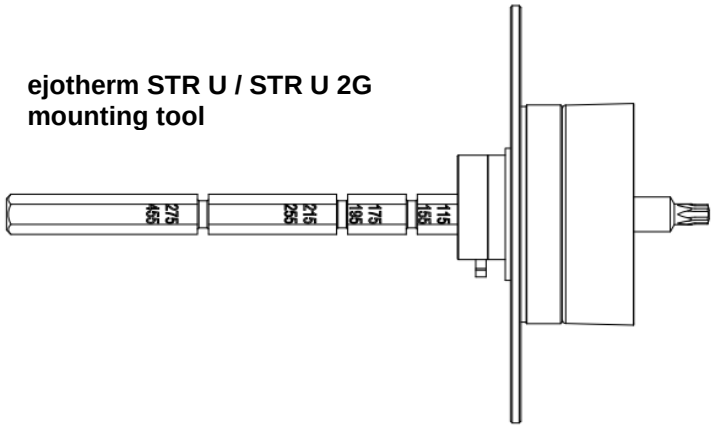


Marking:
Identifying mark (EJOT)
Anchor type (ejotherm STR U 2G)
Length of anchor (e.g. 175)
Use category (A,B,C,D, E)

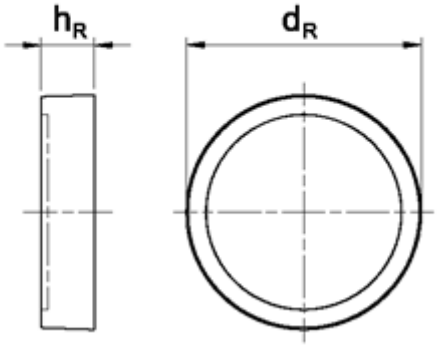




ejotherm STR U / STR U 2G
mounting tool

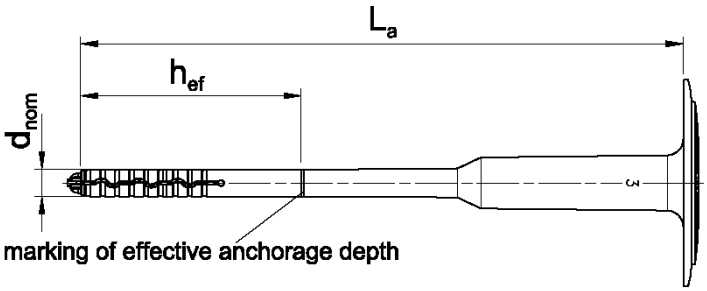


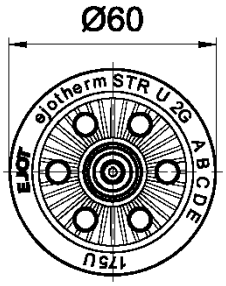
Insulation cover

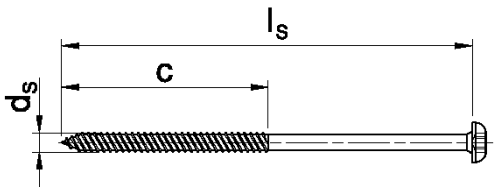


ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U	Annex A 8
Product description Components for deep mounting, ejotherm STR U 2G, use category E	

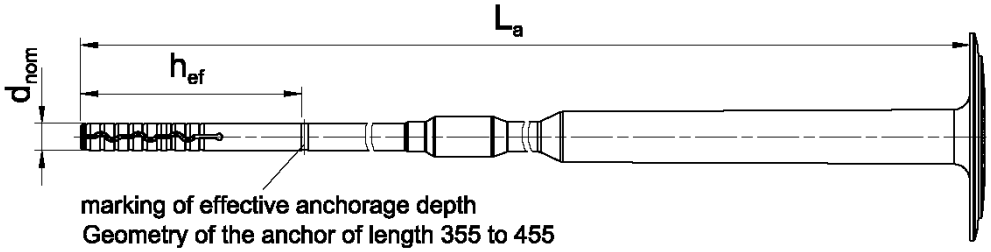
Components for mounting on the surface in use category E



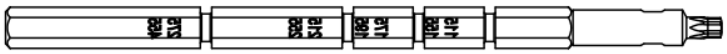




Marking:
Identifying mark (EJOT)
Anchor type (ejotherm STR U 2G)
Length of anchor (e.g. 175)
Use category (A,B,C,D, E)



ejotherm STR U / STR U 2G mounting tool



Anchor cap (to lock up the anchor in case of mounting on the surface)

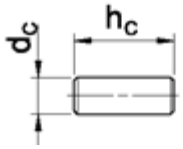


Table A4: Dimensions

Measures in mm

Anchor Type	Colour	Anchor sleeve				Accompanying specific screw				Anchor cap		Insulation cover	
		d_{nom}	h_{ef}	min L_a	max L_a	d_s	c	min l_s	max l_s	h_c	d_c	h_R	d_R
STR U 2G	nature	8	65	115	455	5,5	60	78	338	23	15	15	66

Determination of maximum thickness of insulation h_D for EJOT ejotherm STR U 2G:

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

e.g. $h_D = 155 – 10 – 65$

$h_{Dmax.} = 80$

ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U	Annex A 9
Product description Components for mounting on the surface, ejotherm STR U 2G use category E, dimensions	

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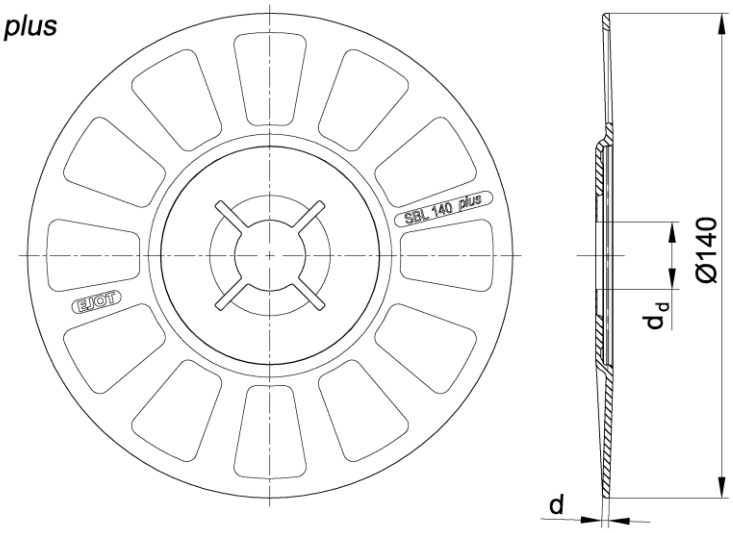
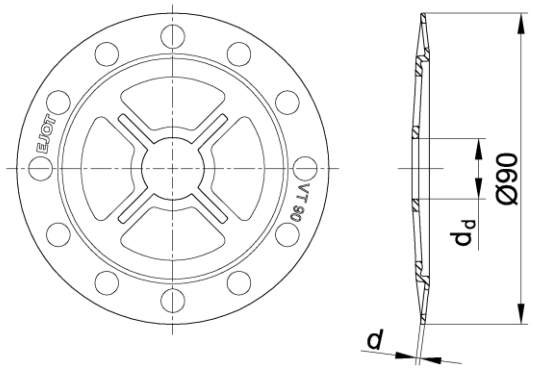
SBL 140 *plus*



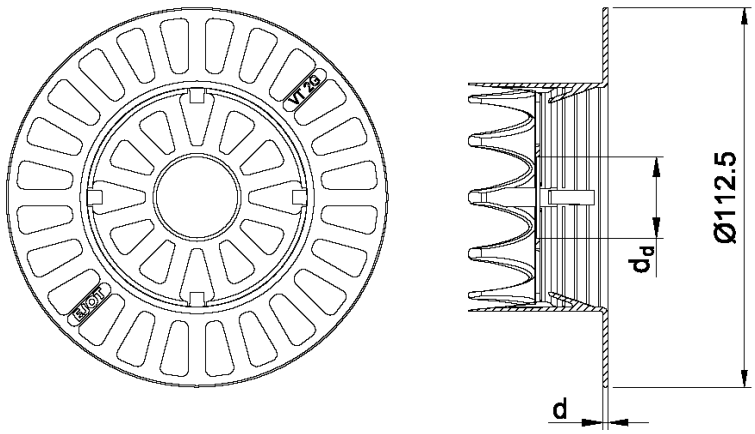
SBL 140 plus	
Farbe	nature
d_d [mm]	20,0
d [mm]	2,0

VT 90



VT 90	
Farbe	nature
d_d [mm]	18,5
d [mm]	1,2

VT 2G



VT 2G	
Farbe	nature
d_d [mm]	29,0
d [mm]	1,5

ejotherm STR U, ejotherm STR U 2G
and ejotherm SDK U

Annex A 10

Product description
Anchor plates in combination with ejotherm STR U and ejotherm STR U 2G

Table A5: Materials	
Name	Materials
Anchor sleeve	virgin polyethylene PE-HD colour: nature, yellow, orange, red, blue, grey
Insulation cover	Polystyrene PS 20
	Mineral wool type HD
Insulation cap	Polystyrene PS 30
Specific screw	Steel, electro galvanized ≥ 5 µm according EN ISO 4042:1999 blue passivated
	Stainless steel according ISO 3506:2009 material number 1.4401 or 1.4571 material number 1.4301 or 1.4567

Table A6: Anchor plate, diameter and materials

anchor plate	Ø D [mm]	Ø d_d [mm]	d [mm]	material
VT 90	90	18,5	1,2	PA 6, PA GF 50
SBL 140 plus	140	20,0	2,0	PA GF 50
VT 2G	112	29,0	1,5	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:

- 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 EOTA Technical Report TR 051 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 anchorages and masonry work with the partial safety factors γ_M = 2,0 and γ_F = 1,5, if there are no other national 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 STR U, ejotherm STR U 2G and ejotherm SDK U	Annex B 1
Intended use Specifications	

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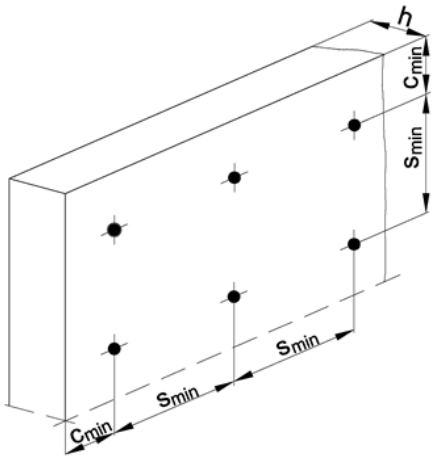
Table B1: Installation parameters					
Anchor type		ejotherm STR U / STR U 2G		ejotherm SDK U	
Use category		A B C D	E	A B C D	E
Drill hole diameter	d_0 [mm]	8	8	8	8
Cutting diamter of drill bit	d_{cut} [mm] ≤	8,45	8,45	8,45	8,45
Depth of drilled hole to deepest point					
- deep mounting	h_1 [mm] ≥	50	90	-	-
- mounting on the surface	h_2 [mm] ≥	35	75	35	75
Effective anchorage depth	h_{ef} [mm] ≥	25	65	25	65

Table B2: Anchor distances and dimensions of members			
Anchor type		ejotherm STR U / STR U 2G / SDK U	
Use category		A B C D	E
Minimum allowable spacing	s_{min} ≥ [mm]	100	100
Minimum allowable edge distance	c_{min} ≥ [mm]	100	100
Minimum thickness of member			
- deep mounting	h ≥ [mm]	100 40 (only thin skins of concrete)	120
- mounting on the surface	h ≥ [mm]	100 40 (only thin skins of concrete)	120

Scheme of distance and spacing



ejotherm STR U, ejotherm STR U 2G
and ejotherm SDK U

Intended use
Installations parameters, anchor distances and dimensions of members

Annex B 2

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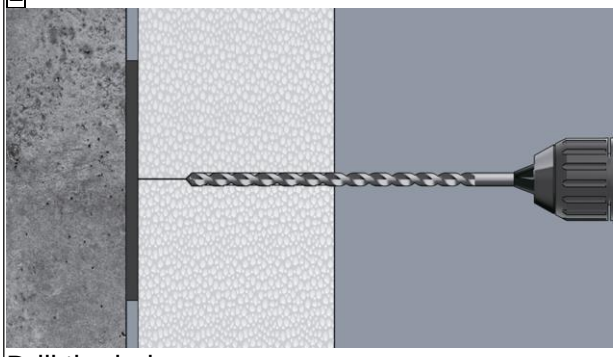
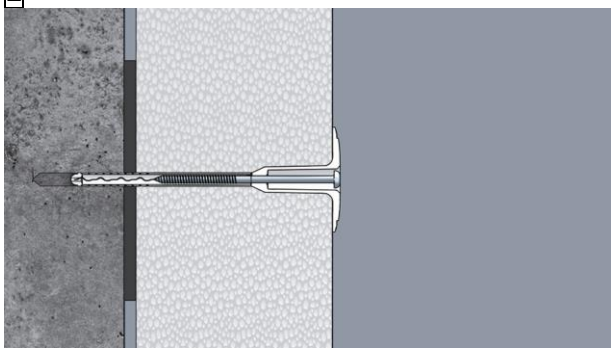
1



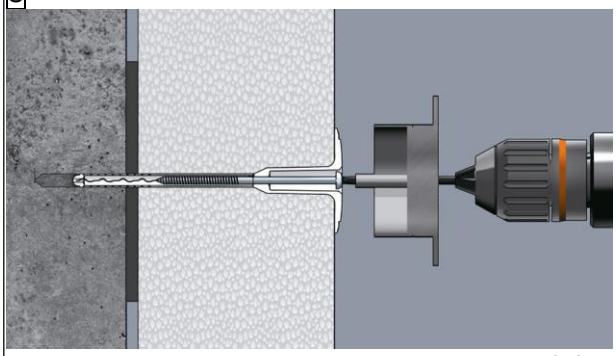
Drill the hole

2



Insert the anchor

3



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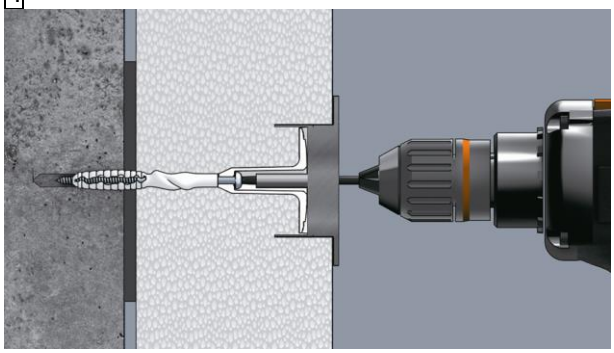
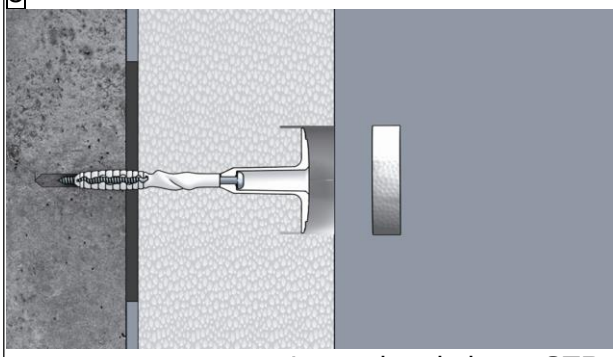


Countersunk installation with STR-tool

5



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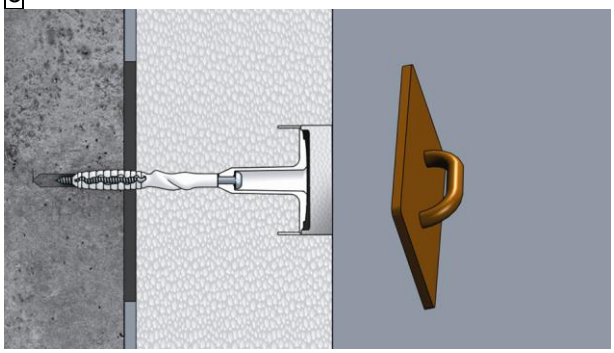
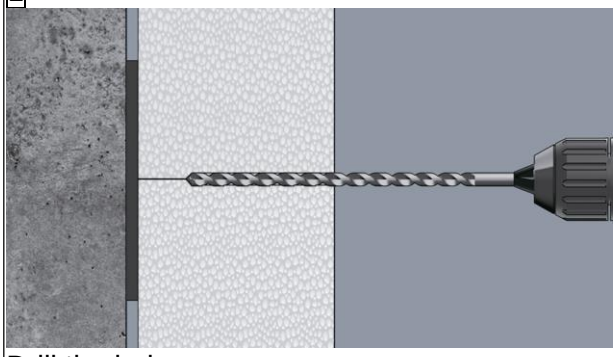


Insert the ejotherm STR - insulation cover with the help of a float

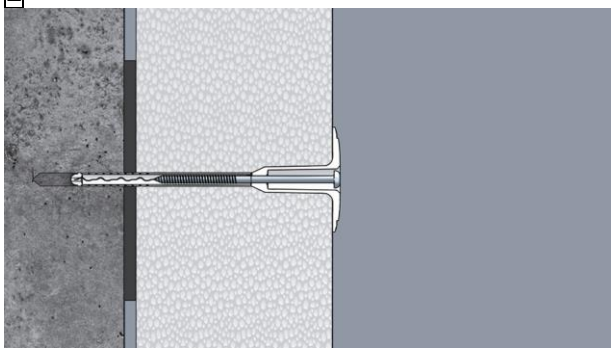
ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U	Annex B 3
Intended use Installation instructions countersunk mounted with STR insulation cover	

1



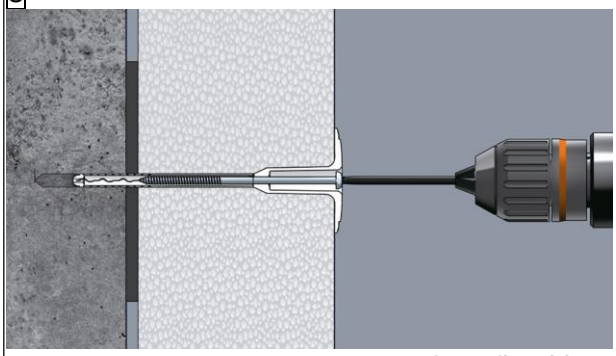
Drill the hole

2



Insert the anchor

3



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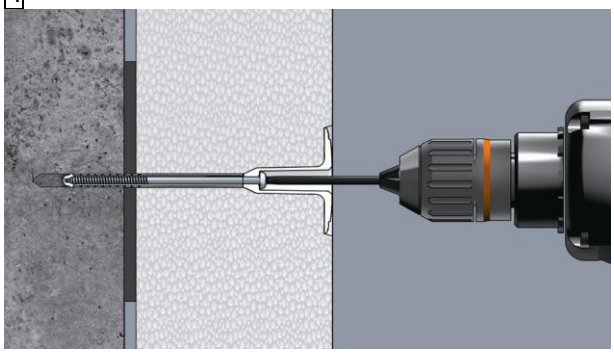
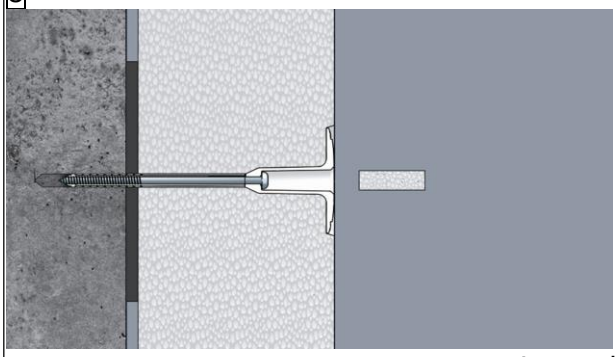


^ Surface fixed installation with STR-tool or standard bit

5



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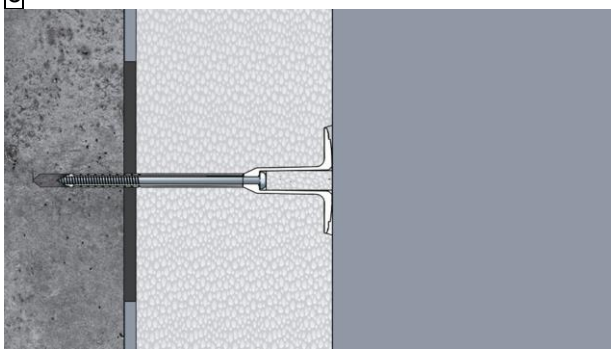

Insert the STR plug

ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U	Annex B 4
Intended use Installation instructions - surface fixed installation with STR plug	

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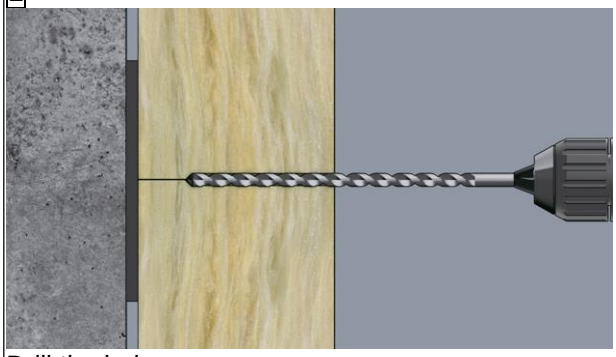
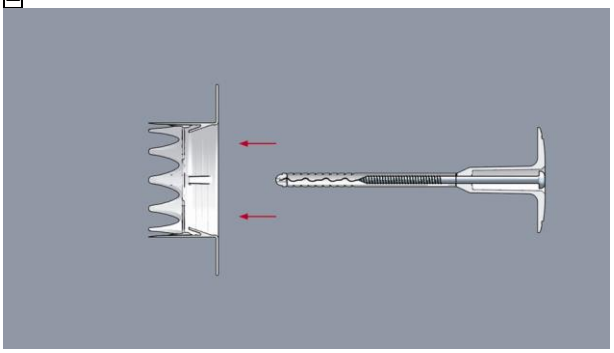
1



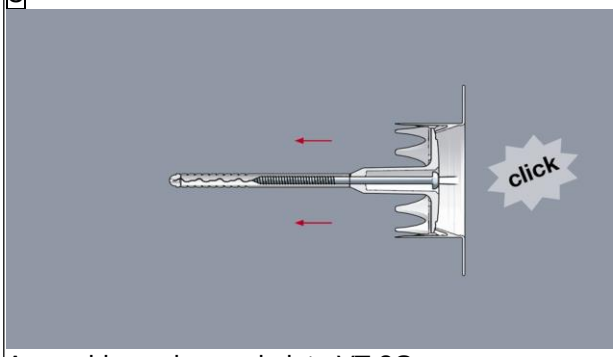
Drill the hole

2



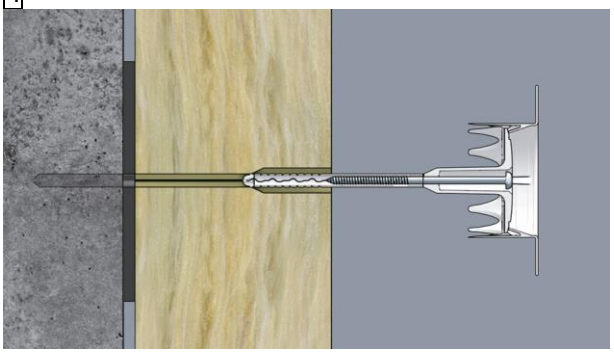
Assemble anchor and plate VT 2G

3



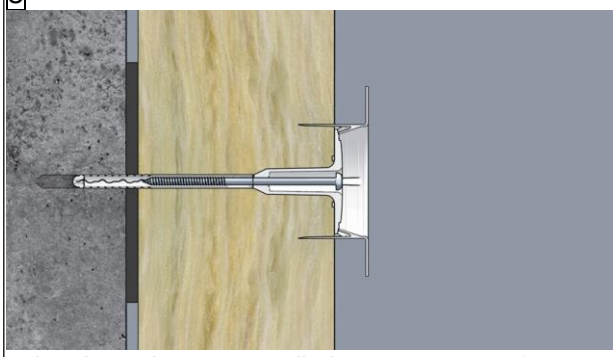
Assemble anchor and plate VT 2G

4



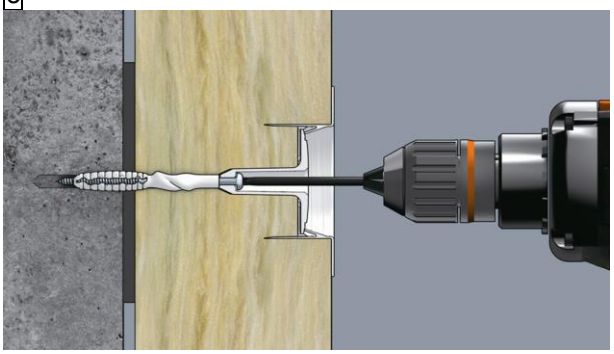
Insert the anchor into the drill hole

5



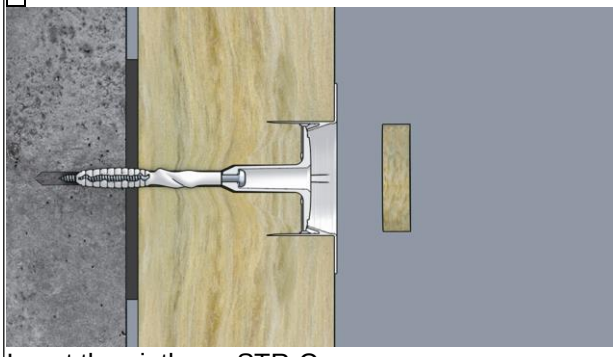
Drive through VT 2G until plate rests on surface

6



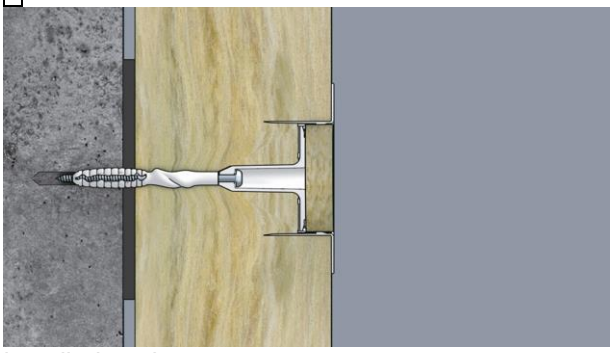
Mounting on the surface with STR tool

7



Insert the ejotherm STR-Cap

8



installed anchor

ejotherm STR U, ejotherm STR U 2G
and ejotherm SDK U

Annex B 5

Intended use
Installation instructions - countersunk fixed installation with VT 2G plate and with STR insulation cover

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

Anchor type ejotherm STR U / STR U 2G / SDK U

Base materials	Bulk density class ρ [kg/dm³]	minimum compressive strength f_b [N/mm²]	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 of external wall panels) C16/20 – C50/60, EN 206-1:2000			Thickness of the thin skin 100 mm > h ≥ 40 mm	hammer	1,5
Clay bricks, Mz DIN 105-100:2012-01 / EN 771-1:2011	≥ 1,8	12	Vertically perforation up to 15 %	hammer	1,5
Sand-lime solid bricks, KS DIN V 106:2005-10 / EN 771-2:2011	≥ 1,8	12	Vertically perforation up to 15 %	hammer	1,5
Vertically perforated clay bricks, Hlz, DIN 105-100:2012-01 / EN 771-1:2011	≥ 1,2	12	Vertically perforation more than 15% and less than 50 %, outer web thickness ≥ 12 mm	rotary	1,2
Lightweight concrete solid blocks, V, DIN 18152-100:2005-10 / EN 771-3:2011	≥ 0,9	4	Proportion of hole up to 10%, maximum extension of hole: length = 110mm; wide = 45mm	rotary	0,6
Sand-lime perforated bricks, KSL DIN V 106:2005-10 / EN 771-2:2011	≥ 1,6	12	Vertically perforation more than 15% and less than 50 %, outer web thickness ≥ 20 mm	rotary	1,5 [1)]
Lightweight concrete hollow blocks, Hbl, DIN V 18151-100:2005-10 / EN 771-3:2011	≥ 0,5	2	Vertically perforation more than 15% and less than 50 %, outer web thickness ≥ 30 mm	rotary	0,6
Lightweight aggregate concrete LAC 4 – LAC 25 EN 1520:2011 / EN 771-3:2011	≥ 1,8	4	-	hammer	0,9
Autoclaved aerated concrete EN 771-4:2011	≥ 0,4	2	-	rotary	0,75
Vertically perforated clay bricks Hlz 250x380x235 EN 771-1:2011			Outer web thickness ≥ 10,3 mm	rotary	0,75

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

ejotherm STR U, ejotherm STR U 2G
and ejotherm SDK U

Performance
Characteristic tension resistance

Annex C 1

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]
ejotherm STR U mounted on the surface with EPS anchor cap	60 – 420	0,002
ejotherm STR U mounted countersunk with insulation cover	80 – 420	0,002
ejotherm STR U 2G mounted on the surface with EPS anchor cap	60 – 400	0,002
ejotherm STR U 2G mounted countersunk with insulation cover	80 – 400	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]
ejotherm STR U ejotherm STR U 2G	60	2,08	0,60

Tabelle C4: Displacements					
Base material	Bulk density class ρ [kg/dm³]	Minimum Compressive Strength f_b [N/mm²]	Tension Load N [kN]	Displacements STR U $\delta_{(N)}$ [kN/mm]	Displacements STR U 2G $\delta_{(N)}$ [kN/mm]
Concrete C16/20 – C50/60 (EN 206-1:2000)			0,5	0,7	0,8
Thin concrete members (e.g. weather resistant skin of external wall panels) Concrete C16/20 – C50/60 (EN 206-1:2000)			0,5	0,7	0,8
Clay brick,Mz (DIN 105-100:2012-01 / EN 771-1:2011)	≥ 1,8	12	0,5	0,7	0,8
Sand-lime solid brick, KS (DIN V 106:2005-10 / EN 771-2:2011)	≥ 1,8	12	0,5	0,7	0,8
Lightweight concrete solid blocks, V (DIN V 18152-100:2005-10 / EN 771-3:2011)	≥ 0,9	4	0,2	0,7	0,8
Vertically perforated clay brick, HLz (DIN 105-100:2012-01 / EN 771-1:2011)	≥ 1,2	12	0,4	0,7	0,8
Vertically perforated sand-lime brick, KSL (DIN V 106:2005-10 / EN 771-2:2011)	≥ 1,6	12	0,5	0,7	0,8
Leightweight concrete hollow block Hbl (DIN 18151-100:2005-10 / EN 771-3:2011)	≥ 0,5	2	0,2	0,7	0,8
Lightweight aggregate concrete LAC 4 – LAC 25 (EN 1520:2011-06 / EN 771-3:2011)	≥ 1,8	4	0,3	0,7	0,8
Autoclaved aerated concrete (EN 771-4:2011)	≥ 0,4	2	0,25	0,7	0,8
Vertically perforated clay brick, HLz 250x380x235 (EN 771-1:2011)			0,25	0,7	0,8

ejotherm STR U, ejotherm STR U 2G and ejotherm SDK U	Annex C 3
Performance Displacements	