

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

**ETA-19/0633**  
**of 19 March 2020**

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 SDF-DS 10 H

Product family  
to which the construction product belongs

Plastic anchor for multiple use in concrete and  
masonry for non-structural applications

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

ETAG 020, edition March 2012  
used as EAD according to Article 66 Paragraph 3 of  
Regulation (EU) No 305/2011

**European Technical Assessment**

**ETA-19/0633**

English translation prepared by DIBt

**Page 2 of 18 | 19 March 2020**

The European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may only be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction shall be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission in accordance with Article 25(3) of Regulation (EU) No 305/2011.

## Specific Part

### 1 Technical description of the product

The EJOT SDF-DS 10H is a plastic anchor consisting of a plastic sleeve made of polyamide and an accompanying specific screw of carbon steel with zinc flake coating with a shaft coating of polyamide.

The plastic sleeve is expanded by screwing in the specific screw which presses the sleeve against the wall of the drilled hole.

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 anchors of at least 50 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 in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A 1
Resistance to fire	See Annex C 2

#### 3.2 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance
Characteristic resistance for tension and shear loads	See Annexes C 1 – C 5
Characteristic resistance for bending moments	See Annex C 1
Displacements under shear and tension loads	See Annex C 2
Anchor distances and dimensions of members	See Annex B 3 – B 5

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

In accordance with guideline for European technical approval ETAG 020, March 2012 used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011 the applicable European legal act is: 97/463/EC.

The system to be applied is: 2+

**5 Technical details necessary for the implementation of the AVCP system, as provided 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 at Deutsches Institut für Bautechnik.

Issued in Berlin on 19 March 2020 by Deutsches Institut für Bautechnik

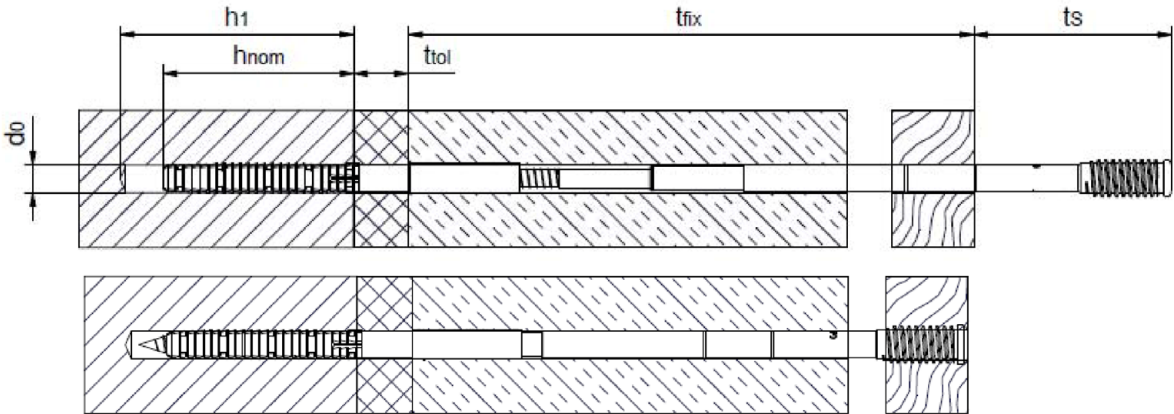
BD Dipl.-Ing. Andreas Kummerow  
Head of Department

*beglaubigt:*  
Ziegler

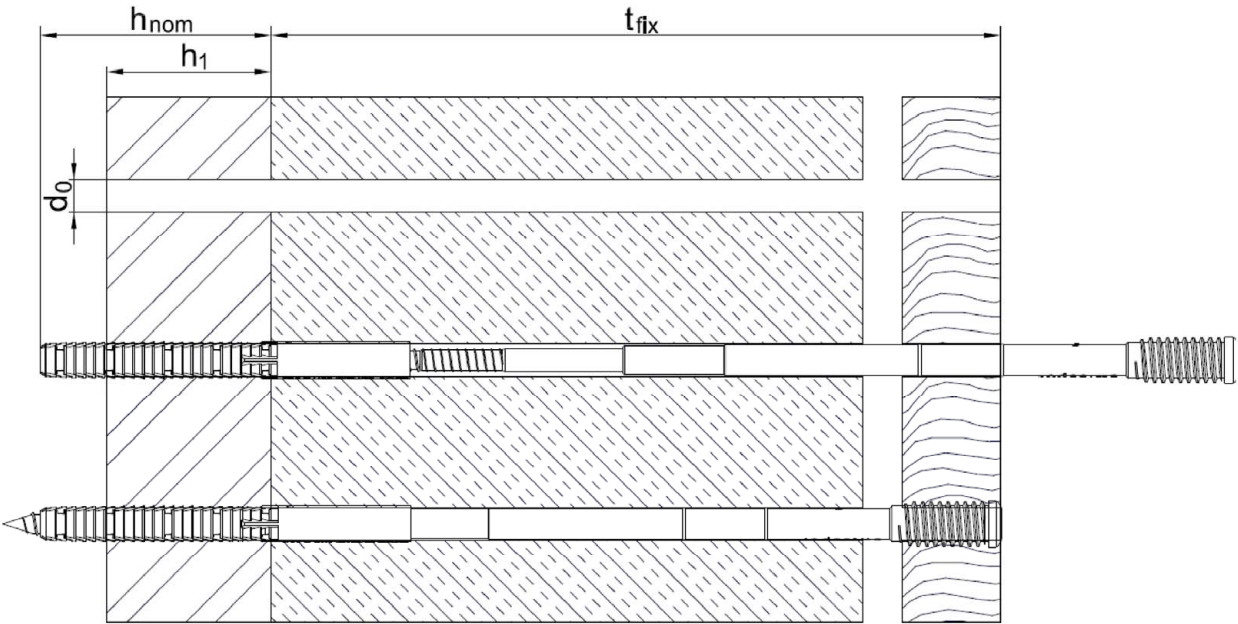
**Intended use**

Anchorage in concrete, solid bricks, hollow or perforated bricks, autoclaved aerated concrete (AAC) and thin concrete components (weather shell)

**SDF-DS 10H in concrete and masonry**



**SDF-DS 10H in thin concrete components (weather shell)**



**Legend**

- $h_1$  = Depth of drilled hole to deepest point
- $h_{nom}$  = Overall plastic anchor embedment depth
- $t_{tol}$  = Thickness of equalizing layer or non-load bearing coating
- $t_{fix}$  = thickness of old render / tolerance area
- $t_s$  = control measurement from screw head to wooden frame
- $d_1$  = diameter of drilled hole in the wooden frame

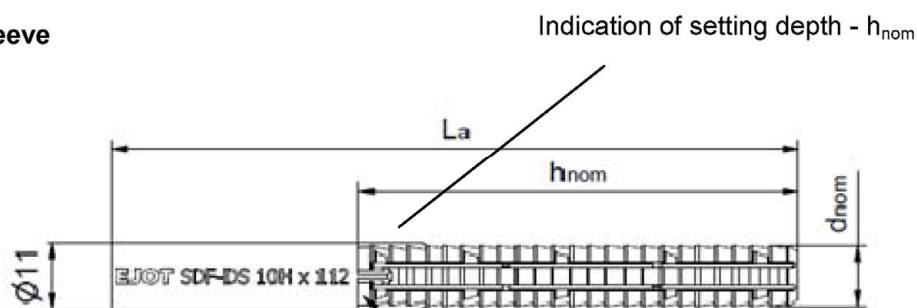
EJOT SDF-DS 10 H

**Product description**  
Installed condition

**Annex A 1**

## Anchor sleeve SDF-DS 10H

### Anchor sleeve

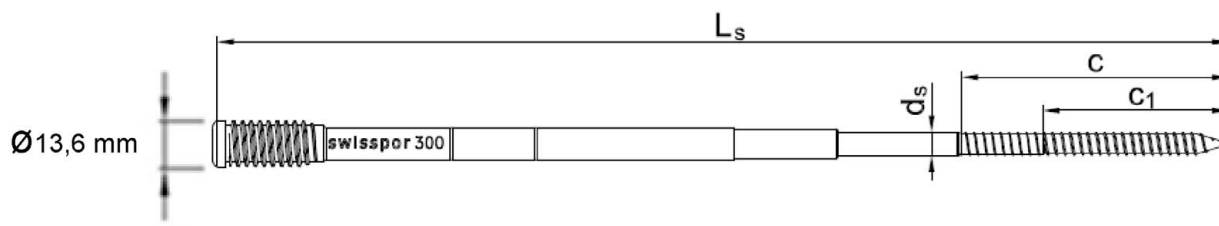


#### Marking of anchor sleeve:

Manufacturer, anchor type incl. head type  
diameter, length

Example: EJOT SDF-DS 10H x 112

## Special screw



#### Marking of special screw:

Manufacturer, length

Example: swisspor 300

EJOT SDF-DS 10 H

### **Product description**

Anchor types, marking of anchor sleeve and special screw

**Annex A 2**

## Product designation key

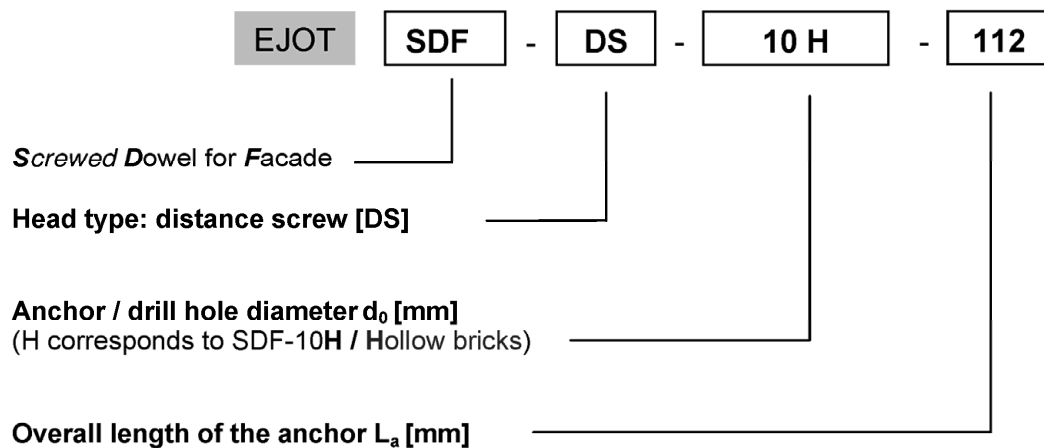


Table A3.1: Dimensions [mm]

Anchor type	Anchor sleeve						Special screw					
	colour	$d_{nom}$	$h_{nom}$	$t_{tol}$	min $L_a$	max $L_a$	min $L_s$	max $L_s$	$d_g$	$d_s$	$C_1$	C
SDF-DS 10H	nature	10	70	0-40	112	152	200	450	13,6	7,0	55	80

Table A3.2: Material

Element	Material
Anchor sleeve	Polyamide PA6, colour see Table A3.1
Moulded screw	Polyamide PA6, GF 50, colour: anthracite (RAL 7016)
Special screw	Carbon steel with zinc flake coating

EJOT SDF-DS 10 H

**Product description**  
Product designation key, dimensions, material

**Annex A 3**

## Specifications of intended use

### Anchorage is subject to:

- Static and quasi-static loads
- Multiple fixing of non-structural applications

### Base materials:

- Reinforced or unreinforced normal weight concrete with strength classes  $\geq$  C12/15 (usage category a), according to EN 206-1:2000, Annex C 2
- thin concrete components (weather shell)  $\geq$  50 mm thickness
- Solid brick masonry (usage category b), according to Annex C 3 and C 4.

Note: The characteristic resistance is also valid for larger brick sizes and larger compressive strength of the masonry unit.

- Hollow brick masonry (usage category c), according to Annex C 5.
- Autoclaved aerated concrete (usage category d), according to Annex C 6.
- Mortar strength class of the masonry  $\geq$  M2,5 at minimum according to EN 998-2:2010.

For other base materials of the use categories a, b, c and d the characteristic resistance of the anchor may be determined by job site tests according to ETAG 020, Annex B edition March 2012.

### Temperature Range:

- c:  $-40^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  (max. short term temperature  $+50^{\circ}\text{C}$  and max. long term temperature  $+30^{\circ}\text{C}$ )
- b:  $-40^{\circ}\text{C}$  to  $80^{\circ}\text{C}$  (max. short term temperature  $+80^{\circ}\text{C}$  and max. long term temperature  $+50^{\circ}\text{C}$ )

### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions
- Structures subject to external atmospheric exposure, if the area of the head of the screw is protected against moisture and driving rain after mounting of the fixing unit in this way, that intrusion of moisture into the anchor shaft is prevented. Therefore there shall be an external cladding or a ventilated rainscreen mounted in front of the head of the screw and the head of the screw itself shall be coated with a soft plastic, permanently elastic bitumen-oil-combination coating (e. g. undercoating or body cavity protection for cars).

### Design:

- The anchorages are designed in accordance with the ETAG 020, Annex C Edition March 2012 under the responsibility of an engineer experienced in anchorages and masonry work.
- Verifiable calculation notes and drawings shall be prepared taking account of the loads to be anchored, the nature and strength of the base materials and the dimensions of the anchorage members as well as of the relevant tolerances. The position of the anchor is indicated on the design drawings.
- Fasteners are only to be used for multiple use for non-structural application, according to ETAG 020 Edition March 2012.

### Installation:

- Hole drilling by the drill modes acc. to Annex C for use category a,b,c and d.
- 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  $-10^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$
- Exposure to UV due to solar radiation of anchor not protected  $\leq$  6 weeks

EJOT SDF-DS 10 H

Intended use  
Specifications

Annex B 1



**Table B2.1: Installation parameters**

Anchor type			SDF-DS 10H
Use category <sup>1)</sup>			a,b,c,d
drill hole diameter	$d_o$ [mm]	=	10
Cutting diameter of drill bit	$d_{cut}$ [mm]	≤	10,45
Depth of the drill hole to deepest point	$h_1$ [mm]	≥	80
Overall plastic anchor embedment depth <sup>2)</sup>	$h_{nom}$ [mm]	=	70
Length of the screw	$L_s$	≥	$t_{fix} - h_{ef}$
Diameter of clearance hole in the fixture	$d_1$ [mm]	≤	11,5
Minimum installation temperature	[°C]		-10
Temperature range (c)	[°C]		30 - 50
Temperature range (b)	[°C]		50 - 80

<sup>1)</sup> Use category: a = concrete, b = solid masonry, c = hollow or perforated masonry,  
d = autoclaved aerated concrete

<sup>2)</sup> For masonry of hollow or perforated brick the influence  $h_{nom} > 70$  mm has to be determined by job-site tests according to ETAG 020, Annex B.

**EJOT SDF-DS 10 H**

**Intended use**

Installation parameters use category a, b, c, d

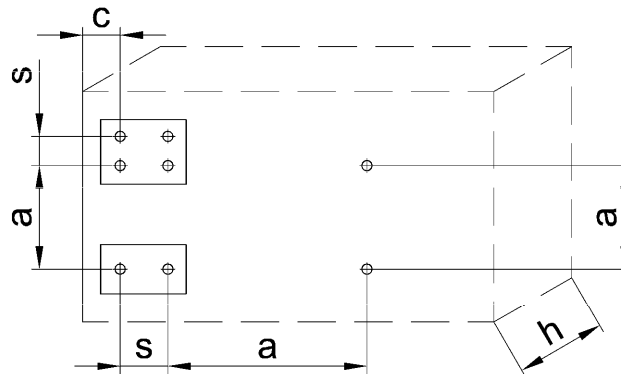
**Annex B 2**

**Table B3.1: Minimum member thickness, spacing and edge distance in concrete (use category a)**

Anchor type		Min. member thickness $h_{min}$ [mm]	Characteristic edge distance $c_{cr,N}$ [mm]	Minimum spacing and edge distances [mm]
SDF-DS 10H	concrete $\geq$ C 16/20	100	80	$s_{min} = 60$ für $c_{min} \geq 50$
	concrete C 12/15		110	$s_{min} = 85$ für $c_{min} \geq 70$
	concrete C20/25 (thin concrete slabs)	50	160	$s_{min} = 80$ für $c_{min} \geq 160$

Fixing points with a spacing  $a \leq 80$  mm are considered as a group with a maximum characteristic resistance  $N_{Rk,p}$  according to Table C2.2. For spacing  $a > 80$  mm the anchors are considered as single anchors, each with a characteristic resistance  $N_{Rk,p}$  acc. to Table C2.2.

**Scheme of spacing and edge distances in concrete**



$h$  = member thickness  
 $c$  = edge distance  
 $a$  = spacing  
 $s_{min}$  = spacing within anchor group

EJOT SDF-DS 10 H

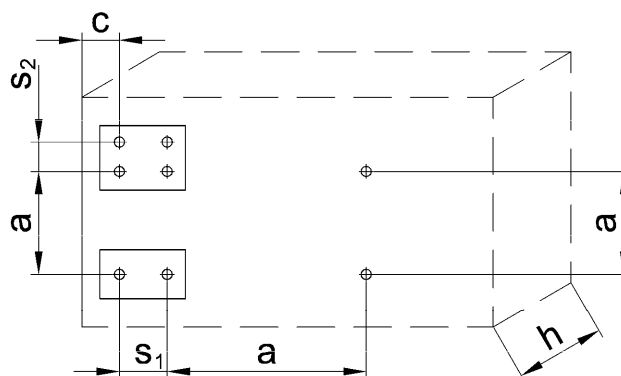
**Intended use**  
Minimum member thickness, spacing and edge distance in concrete

**Annex B 3**

**Table B4.1: Minimum member thickness, spacing and edge distance in masonry (use category b and c)**

Anchor type		SDF-DS 10H
Minimum member thickness	$h_{\min}$ [mm]	100
<b>Single anchor</b>		
Minimum edge distance	$c_{\min}$ [mm]	100
Minimum spacing	$a_{\min}$ [mm]	250
<b>Anchor group</b>		
Minimum edge distance	$c_{\min}$ [mm]	100
Minimum spacing perpendicular to free edge	$s_{1,\min}$ [mm]	100
Minimum spacing parallel to free edge	$s_{2,\min}$ [mm]	100

**Scheme of spacing and edge distances in masonry**



$h$	=	member thickness
$a$	=	spacing
$c$	=	edge distance
$s_1$	=	spacing (perpendicular to the free edge) within an anchor group
$s_2$	=	spacing (parallel to the free edge) within an anchor group

EJOT SDF-DS 10 H

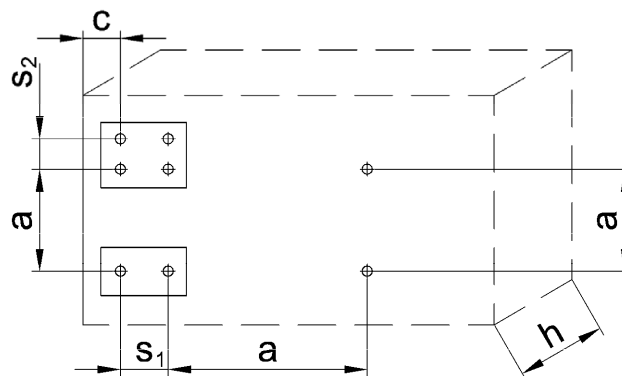
**Intended use**  
Minimum member thickness, spacing and edge distance in masonry

**Annex B 4**

**Table B5.1: Minimum member thickness, spacing and edge distance in autoclaved aerated concrete (use category d)**

SDF-DS 10H		$f_{ck} \geq 4 \text{ N/mm}^2$	$f_{ck} \geq 6 \text{ N/mm}^2$
Single anchor			
Minimum member thickness	$h_{min} \text{ [mm]}$	100	140
Minimum edge distance	$c_{min} \text{ [mm]}$	100	
Minimum spacing	$a_{min} \text{ [mm]}$	250	
Anchor group			
Minimum member thickness	$h_{min} \text{ [mm]}$	140	
Minimum edge distance	$c_{1,min} \text{ [mm]}$	100	
Minimum edge distance (perpendicular to $c_{1,min}$ )	$c_{2,min} \text{ [mm]}$	150	
Minimum spacing perpendicular to free edge	$s_{1,min} \text{ [mm]}$	80	
Minimum spacing parallel to free edge	$s_{2,min} \text{ [mm]}$	80	

**Scheme of spacing and edge distances in autoclaved aerated concrete**



$h$	=	member thickness
$a$	=	spacing
$c$	=	edge distance
$s_1$	=	spacing (perpendicular to the free edge) within an anchor group
$s_2$	=	spacing (parallel to the free edge) within an anchor group

**EJOT SDF-DS 10 H**

**Intended use**

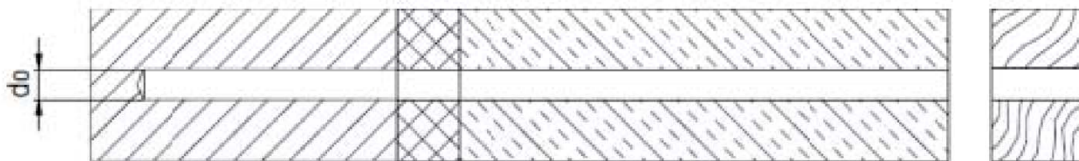
Minimum member thickness, spacing and edge distance in autoclaved aerated concrete

**Annex B 5**

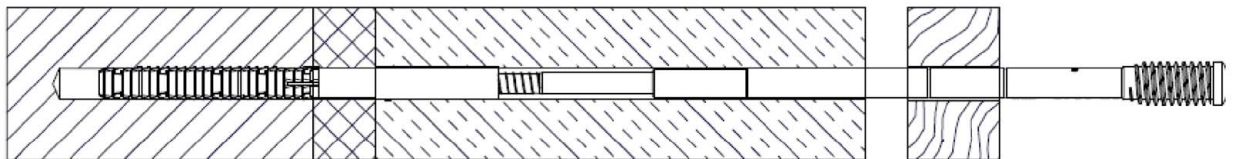
## Installation instructions

### (exemplary for the fixing of a pre-drilled metal attachment part)

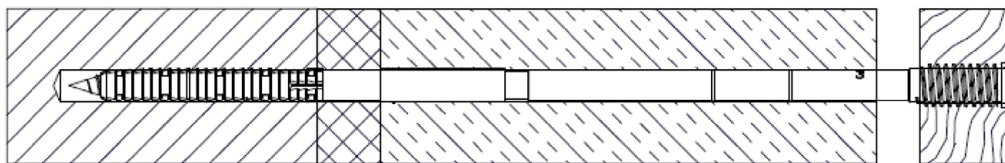
- Determination of thickness of plaster
- Definition of the length of the anchor sleeve
- Positioning the wooden frame
- Drill a hole in the wooden frame by using a  $\varnothing$  11.5 mm wood driller
- Drill a 10 mm diameter hole using the drilling method given in Annex C.
- Cleaning the borehole



- Assembly of the pre-assembled dowels / screw combination up to upper marking (acc. to Annex A1, installation condition)



- Screw in the specific screw into the anchor sleeve and into the wooden batten until the screw head is flush with the wooden surface.



EJOT SDF-DS 10 H

Intended use  
Installation instructions

Annex B 6

**Table C1.1: Characteristic bending moment of the screw (use category a, b, c and d)**

<b>Anchor type</b>	<b>SDF-DS 10H</b>
<b>Material</b>	Steel with zinc flake coating
<b>Characteristic bending moment <math>M_{Rk,s}</math> [Nm]</b>	29,46
<i>Partial safety factor <math>\gamma_{Ms}</math> <sup>1)</sup></i>	1,5

<sup>1)</sup> in absence of other national regulations

**Table C1.2: Characteristic resistance of the screw (use category a, b, c and d)**

<b>Anchor type</b>	<b>SDF-DS 10H</b>
<b>Material</b>	Steel with zinc flake coating
<b>Characteristic tension resistance <math>N_{Rk,s}</math> [kN]</b>	31,17
<i>Partial safety factor <math>\gamma_{Ms}</math> <sup>1)</sup></i>	1,4
<b>Characteristic shear resistance <math>V_{Rk,s}</math> [kN]</b>	15,59
<i>Partial safety factor <math>\gamma_{Ms}</math> <sup>1)</sup></i>	1,5

<sup>1)</sup> in absence of other national regulations

**EJOT SDF-DS 10 H**

**Performance**  
Characteristic resistance of the screw

**Annex C 1**

**Table C2.1: Displacements <sup>1)2)</sup> under tension and shear loads (use category a, b, c and d)**

Anchor type		Displacements under tension			Displacements under shear		
		F [kN]	$\delta_{N0}$ [mm]	$\delta_{N\infty}$ [mm]	F [kN]	$\delta_{V0}$ [mm]	$\delta_{V\infty}$ [mm]
Concrete, solid and hollow or perforated masonry							
SDF-DS 10H		1,8	0,37	0,74	1,8	0,41	0,82
Autoclaved aerated concrete							
SDF-DS 10H	$f_b \geq 4 \text{ N/mm}^2$	0,54	0,17	0,34	0,54	1,08	1,62
	$f_b \geq 6 \text{ N/mm}^2$	0,89	0,41	0,82	0,89	1,78	2,67

<sup>1)</sup> Valid for all temperature ranges

<sup>2)</sup> Intermediate values can be interpolated

**Table C2.2: Characteristic resistance for pull-out failure, use in concrete**

Pull-out failure	SDF-DS 10H	
Overall plastic anchor embedment depth $h_{nom}$ [mm]	70	
Temperature range	30/50 °C	50/80 °C
Concrete $\geq$ C 12/15 Standard concrete slabs		
Characteristic tension resistance $N_{Rk,p}$ [kN]	4,5	4,0
Partial safety factor $\gamma_{Mc}$ <sup>1)</sup>	1,8	
Concrete $\geq$ C12/15 thin concrete slabs ( $h= 50mm$ bis $100\text{ mm}$ )		
Overall plastic anchor embedment depth $h_{nom}$ [mm]	70	
Temperature range	30/50 °C	50/80 °C
Characteristic tension resistance $N_{Rk,p}$ [kN]	3,0	3,0
Partial safety factor $\gamma_{Mc}$ <sup>1)</sup>	1,8	
Characteristic resistance under fire exposure in concrete C 20/25 to C50/60 in any load direction, no permanent centric tension load and without lever arm, fastening of facade systems (Fire resistance class R 90)		
Characteristic tension resistance $F_{Rk,fi,90}$ [kN]	$\leq 0,8$	
Partial safety factor $\gamma_{M,fi}$ <sup>1)</sup>	1,0	

<sup>1)</sup> in the absence of other national regulations

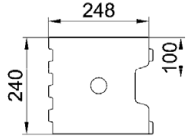
**EJOT SDF-DS 10 H**

**Performances**

Displacements under tension and shear loads, Characteristic resistance in concrete and thin concrete slabs, Characteristic resistance in concrete under fire exposure

**Annex C 2**

**Table C3.1: SDF-DS 10H Characteristic resistance  $F_{Rk}^{1)}$  in solid masonry (use category b) with  $h_{nom} \geq 70$  mm**

Base material, min DF or min. size (LxWxH) [mm]	Geometry of the brick	Minimum com- pressive strength f <sub>b</sub> [N/mm <sup>2</sup> ]	Bulk density ρ [kg/dm <sup>3</sup> ]	F <sub>Rk</sub> <sup>1)</sup> [kN]	F <sub>Rk</sub> <sup>1)</sup> [kN]
				30°C – 50°C	50°C – 80°C
Solid masonry					
Clay brick Mz EN 771-1:2011 e.g. Schlagmann, MZ dimensions: 2 DF (240x115x113)	-	20	≥ 1,8	4,0	4,0
		10		3,0	3,0
Sand-lime solid brick, KS EN 771-2:2011 e.g. Unika dimensions: NF (240x115x71)	-	36	≥ 2,0	4,5	4,5
		20		2,5	2,5
		10		1,5	1,5
Sand-lime solid brick, KS EN 771-2:2011 e.g. Unika dimensions: 8DF (248x240x238)		20	≥ 1,8	4,5	4,5
		10		3,5	3,5
Lightweight concrete solid brick, V EN 771-3:2011 e.g. Fa. Nüdling, Liapor V6 dimensions: 2 DF (240x115x113)	-	6	≥ 1,2	2,0	2,0
		4		1,2	1,2
Lightweight concrete solid block Vbl EN 771-3:2011 e.g. Fa. Nüdling, FCN Liapor dimensions:(1200x800x200)	-	4	≥ 1,0	2,0	2,0
		2		0,9	0,9
Partial safety factor γ <sub>Mm</sub> <sup>2)</sup>				2,5	

1) Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single anchors or for a group of two or four anchors  
with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table B4.1  
Drilling method = Hammer drilling

2) in the absence of other national regulations

**EJOT SDF-DS 10 H**

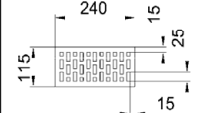
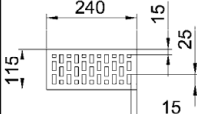
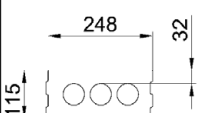
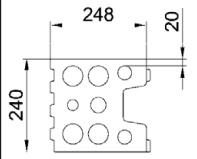
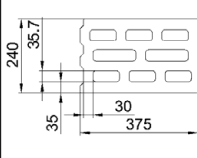
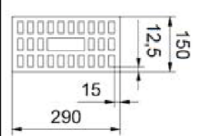
**Performances**  
Characteristic resistance in solid masonry

**Annex C 3**



**Table C4.1: SDF-DS 10H characteristic resistance  $F_{Rk}^{1)}$  for masonry of hollow or perforated brick (use category c) with  $h_{nom} = 70$  mm**

(The influence of  $h_{nom} > 70$  mm has to be detected by job-site tests)

Base material, min DF or min. size (LxWxH) [mm]	Geometry of the brick	Minimum com- pressive strength $f_b$ [N/mm <sup>2</sup> ]	Bulk density $\rho$ [kg/dm <sup>3</sup> ]	$F_{Rk}^{1)}$ [kN]	$F_{Rk}^{1)}$ [kN]
				30°C – 50°C	50°C – 80°C
Hollow or perforated masonry					
Vertically perforated clay brick, HLz EN 771-1:2011 e.g. Unipor dimensions: 2 DF (240x115x113)		20	≥ 1,2	1,50	1,50
		12		0,90	0,90
Vertically perforated clay, HLz EN 771-1:2011 e.g. Unipor dimensions: NF (240x115x71)		12	≥ 0,9	2,00	2,00
		8		1,50	1,50
		6		0,90	0,90
Sand-lime perforated brick, KSL EN 771-2:2011 e.g. Unika dimensions: 4DF (248x115x238)		12	≥ 1,6	2,50	2,50
		10		2,00	2,00
		8		1,50	1,50
Sand-lime perforated brick, KSL EN 771-2:2011 e.g. Unika dimensions: 8DF (248x240x238)		16	≥ 1,4	1,50	1,50
		12		1,20	1,20
		8		0,90	0,90
		6		0,60	0,60
Lightweight concrete hollow blocks, Hbl EN 771-3:2011 e.g. Fa. Nüdling dimensions: 12DF (375x240x238)		10	≥ 1,2	1,20	1,20
		8		0,90	0,90
		6		0,75	0,75
		4		0,50	0,50
Vertically perforated clay brick, HLz EN 771-1:2011 Swissmodul SM B 17,5/19, Fa. zzwancor dimensions: 290x150x190		8	≥ 0,9	1,5	1,5
		6		1,2	1,2
		4		0,9	0,9
Partial safety factor $\gamma_{Mm}^{2)}$				2,5	

<sup>1)</sup> Characteristic resistance  $F_{Rk}$  for tension, shear or combined tension and shear loading.  
The characteristic resistance is valid for single anchors or for a group of two or four anchors  
with a spacing equal or larger than the minimum spacing  $s_{min}$  according to Table B4.1  
Drilling method = Rotary drilling

<sup>2)</sup> in the absence of other national regulations

EJOT SDF-DS 10 H

**Performances**

Characteristic resistance in hollow or perforated masonry

**Annex C 4**

**Table C5.1: SDF-DS 10 characteristic load bearing capacity  $F_{Rk}^{1)}$  for pull-out failure in autoclaved aerated concrete**

Autoclaved aerated concrete according to EN 771-4	Min. compressive strength $f_{ck}$ [N/mm <sup>2</sup> ]	Bulk density $\rho$ [kg/dm <sup>3</sup> ]	$F_{Rk}^{1)}$ [kN]	$F_{Rk}^{1)}$ [kN]
			30°C – 50°C	50°C – 80°C
	4	500	1,5	1,5
	5	500	2,0	2,0
	6	650	2,5	2,0
	7	650	2,5 <sup>3)</sup>	2,0 <sup>3)</sup>
Partial safety factor $\gamma_{MAAC}^{2)}$			2,0	

1) Characteristic load-bearing capacity for tension, shear or combined tension and shear loading.

Drilling method = rotary drilling

2) In the absence of other national regulations

3) Values limited by the characteristic resistance in autoclaved aerated concrete with  $f_{ck} = 6$  N/mm<sup>2</sup>

EJOT SDF-DS 10 H

**Performances**

Characteristic resistance in autoclaved aerated concrete

**Annex C 5**