

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-12/0270
of 31 August 2017

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Trade name of the construction product

Product family
to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment
contains

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

Deutsches Institut für Bautechnik

Rogger RSD-System Anchor

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

Rogger Fasteners AG
Befestigungen und Werkzeuge
Gärbi 1
3257 GROSSAFFOLTERN
SCHWEIZ

Rogger, Herstellwerk 1

Rogger, Herstellwerk 2

16 pages including 3 annexes which form an integral part
of this assessment

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

European Technical Assessment

ETA-12/0270

English translation prepared by DIBt

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Specific part**1 Technical description of the product**

The Rogger RSD 10 system anchor is a plastic anchor consisting of a plastic sleeve made of polyamide and an accompanying specific screw of zinc coated carbon steel, covered with a polymeric coating from the head to the shank.

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 anchor 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 Mechanical resistance and stability (BWR 1)**

The essential characteristics regarding mechanical resistance and stability are included under the Basic Works Requirement Safety in use.

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorage satisfy requirements for Class A1
Resistance to fire	See Annex C 1

3.3 Safety and accessibility in use (BWR 4)

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

3.4 General aspects

The verification of durability is part of testing the essential characteristics. Durability is only ensured if the specifications of intended use according to Annex B are taken into account.

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

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 EAD

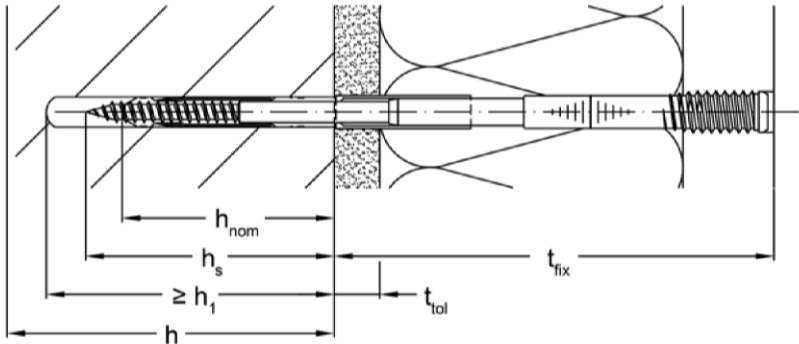
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 31 August 2017 by Deutsches Institut für Bautechnik

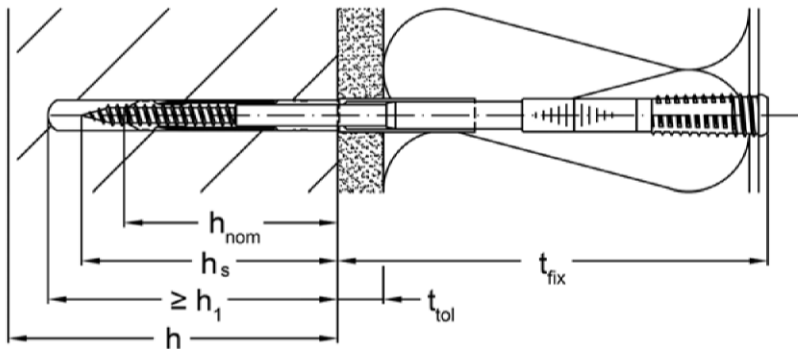
BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Ziegler

Plastic Anchor RSD 10



intended use screw with polymeric thread



intended use screw with stainless steel thread

l_{TH}	length of thread at the head
l_T	length of thread
l_s	length of screw
d_s	diameter of the shank
d_T	diameter of the screw
h_{nom}	overall plastic anchor embedment depth in the base material
d_{nom}	diameter of the plastic sleeve
d_{sh}	diameter of the shaft
l_{sh}	length of shaft
l_d	length of the plastic sleeve
h_1	depth of drill hole to deepest point
h	thickness of member
h_s	screwing depth in the base material
t_{fix}	thickness of fixture
t_{tol}	thickness of non-load-bearing layer

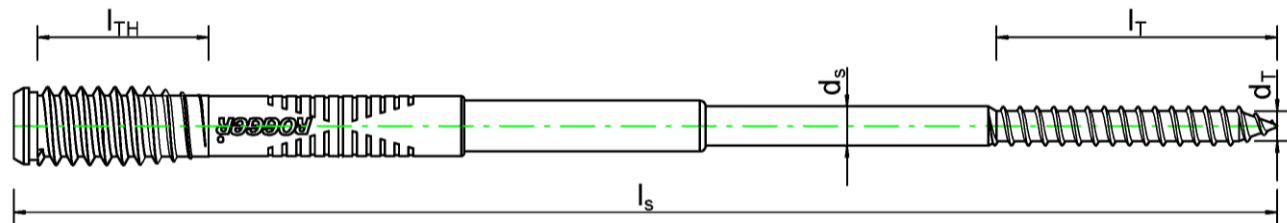
Rogger RSD-System Anchor

Product description
Installed condition

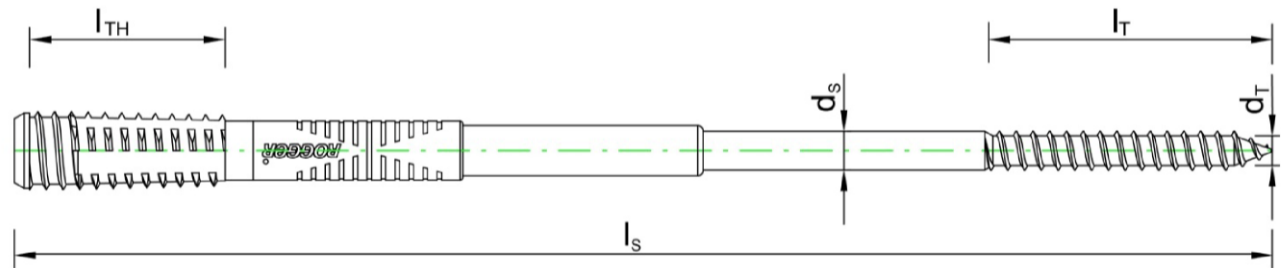
Annex A 1

Plastic Anchor RSD 10

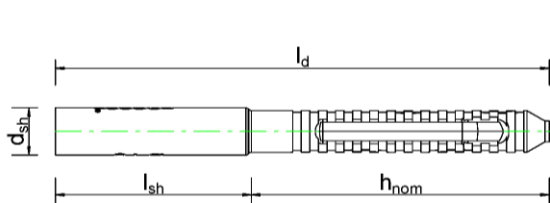
Anchor parts



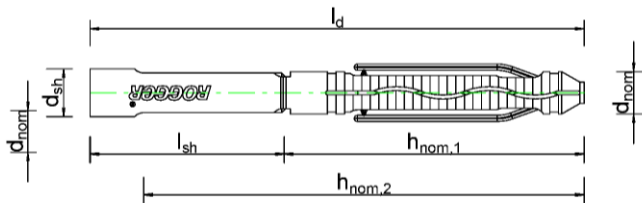
Screw with polymeric thread



Screw with stainless steel thread

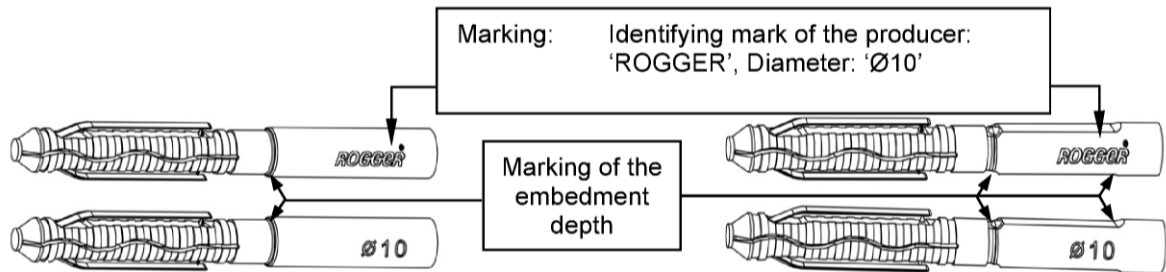


Sleeve for a nominal embedment
 $h_{nom} = 70$ mm
standard version



Sleeve for a nominal embedment
 $h_{nom} = 70$ mm and $h_{nom} = 110$ mm
oblate version

Product marking



Standard sleeve for a nominal
embedment $h_{nom} = 70$ mm

Oblate sleeve for a nominal embedment
 $h_{nom} = 70$ mm and $h_{nom} = 110$ mm

Rogger RSD-System Anchor

Product description
Special screw, anchor sleeve - marking

Annex A 2

Table A3.1 Anchor dimensions

Anchor			RSD 10 normal	RSD 10 oblate version	
Overall plastic anchor embedment depth ¹⁾	$h_{nom} =$	[mm]	70	70	110
Plastic sleeve					
Plastic sleeve diameter	$d_{nom} =$	[mm]	10	10	
Length of plastic sleeve	$l_d =$	[mm]	115,5		
Length of shaft	$l_{sh} =$	[mm]	45,5	45,5	
Diameter of shaft	$d_{sh} \geq$	[mm]	11,2	11,2 (9,3 for the oblate part)	
Special screw					
Screw diameter	$d_T =$	[mm]	5,3		
Shank diameter	$d_S =$	[mm]	7,0		
Length of screw	$l_s \geq$	[mm]	175		
Length of thread	$l_T =$	[mm]	50		
Length of thread at the head (polymeric)	$l_{TH} =$	[mm]	30,5		
Length of thread at the head (stainless steel)	$l_{TH} =$	[mm]	35		

¹⁾ See Annex A 1

Table A3.2 Materials

Designation	Material
Plastic sleeve	Polyamide, colour black
Special screw	Carbon steel, strength class 10.9 ($f_{uk} \geq 1000 \text{ N/mm}^2$; $f_{yk} \geq 900 \text{ N/mm}^2$), according to EN ISO 4042:2001, polymeric coated (polyamide) polymeric thread: galvanised, polymeric coated (polyamide) stainless steel thread: zinc-chrome plated, polymeric coated (polyamide) with stainless steel thread according to EN 10088-3:2014, 1.4305 (AISI 303) or 1.4570 (AISI 303Cu)

Rogger RSD-System Anchor

Product description
Dimensions and materials

Annex A 3

Specifications of intended use

Anchorage 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 (use category a), according to EN 206-1:2000, Annex B 2.
- Solid brick masonry (use category b), according to Annex B 2.
Note: The characteristic resistance is also valid for larger brick sizes and larger compressive strength of the masonry unit.
- Hollow brick masonry (use category c), according to Annex B 2.
- 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 or c the characteristic resistance of the anchor may be determined by job site tests according to ETAG 020, Annex B Edition March 2012.

Temperature Range:

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

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions.
- The specific screws may also be used in 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).
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist.
- Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

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:

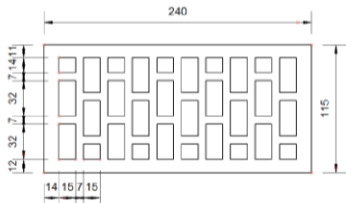
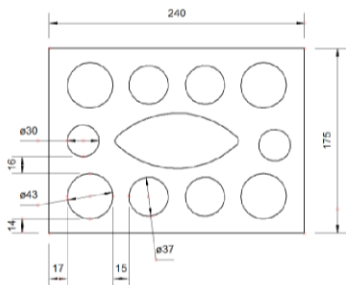
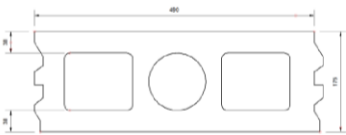
- Hole drilling by the drill modes according to Annex B 3 and B 4 for use category a, b and c.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Installation temperature $\geq -20^{\circ}\text{C}$.
- Exposure to UV due to solar radiation of the anchor not protected ≤ 6 weeks.

Rogger RSD-System Anchor

Intended use
Specifications

Annex B 1

Table B2.1: Base material: Concrete and solid and hollow or perforated masonry units

Base material	Format	Dimensions [mm] Geometry	Minimum compressive- strength [N/mm ²]	Bulk density class [kg/dm ³]
Concrete (use category "a")				
Concrete ≥ C12/15 acc. to EN 206-1:2000			15 ($f_{ck,cube}$)	
Solid and hollow or perforated masonry (use category "b" and "c")				
Solid clay brick Mz acc. to DIN 105-100:2012-01 and EN 771-1:2011 e.g. Wienerberger GmbH	≥ 2DF	≥ 240x115x113	10 20	≥ 1,8
Hollow clay brick HLz acc. to DIN 105-100:2012-01 and EN 771-1:2011	≥ NF	≥ 240x115x71 	4 6 8 10 12	≥ 0,9
Sand-lime solid brick KS acc. to DIN V 106:2005-10 and EN 771-2:2011	≥ NF	≥ 240x115x71	10 20 28	≥ 1,8
Sand-lime hollow brick KSL acc. to DIN V 106:2005-10 and EN 771-2:2011 e.g. KS Wemding GmbH	≥ 3DF	≥ 240x175x113 	6 8 10 12 16 20	≥ 1,4
Lightweight concrete solid brick – V and VbI acc. to DIN V 18152-100:2005-10 and EN 771-3:2011 e.g. Bisotherm GmbH	≥ 2DF	≥ 240x115x113	2 4 6	≥ 1,2
Lightweight concrete hollow brick – HbI acc. to DIN V 18151-100:2005-10 and EN 771-3:2011 e.g. Bisotherm GmbH	≥ 12DF	≥ 490x175x238 	2 4 6	≥ 1,2

Rogger RSD-System Anchor

Intended use
Base material, use category a, b and c

Annex B 2

Table B3.1: Installation parameters for concrete

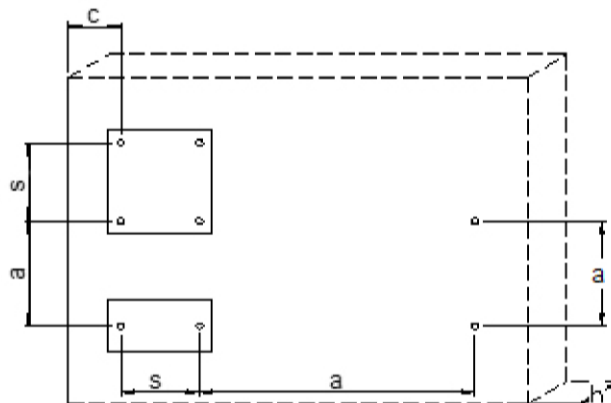
Anchor type			RSD 10
Drill hole diameter	$d_0 =$	[mm]	10
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10,45
Depth of drill hole to deepest point ¹⁾	$h_1 \geq$	[mm]	95
Drill method		[-]	Hammer drilling
Overall plastic anchor embedment depth ¹⁾	$h_{nom} =$	[mm]	70
Diameter of clearance hole in the fixture (polymeric thread)	$d_f =$	[mm]	11,5
Diameter of clearance hole in the fixture (stainless steel thread)	$d_f =$	[mm]	12,5
Thickness of fixture	$t_{fix} \geq$	[mm]	100
(based on the nominal screwing depth)	$t_{fix} \leq$	[mm]	375
nominal screwing depth	$h_s =$	[mm]	75
tolerance of the screwing depth		[mm]	$65 \leq h_s \leq 90$
Thickness of non-loadbearing layer	$t_{tol} \leq$	[mm]	25

¹⁾ See Annex A 1

Table B3.2: Minimum thickness of member, edge distance and anchor spacing in concrete

Fixing points with a spacing $a \leq s_{cr,N}$ are considered as a group with a max. characteristic resistance $N_{Rk,p}$ according to Annex C 1. For $a > s_{cr,N}$ the anchors are considered as single anchors, each with a characteristic resistance $N_{Rk,p}$ acc. to Annex C 1.

			RSD 10	
concrete			$\geq C16/20$	C12/15
minimum thickness of member	h_{min}	[mm]	125	125
characteristic edge distance	$c_{cr,N}$	[mm]	80	110
minimum allowable edge distance	c_{min}	[mm]	70	100
characteristic / minimum allowable spacing	$s_{cr,N} / s_{min}$	[mm]	70	100



Minimum edge distance and spacing in concrete

Rogger RSD-System Anchor

Intended use

Installation parameters, edge distances and spacing for use in concrete

Annex B 3

Table B4.1: Installation parameters for solid bricks¹⁾

Anchor size			RSD 10	
Drill hole diameter	$d_0 =$	[mm]	10	
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10,45	
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	95	
Drill method		[-]	Hammer drilling	
Overall plastic anchor embedment depth ²⁾	$h_{nom} =$	[mm]	70	
Diameter of clearance hole in the fixture (polymeric thread)	$d_f =$	[mm]	11,5	
Diameter of clearance hole in the fixture (stainless steel thread)	$d_f =$	[mm]	12,5	
Thickness of fixture (based on the nominal screwing depth)	$t_{fix} \geq$	[mm]	100	
	$t_{fix} \leq$	[mm]	375	
nominal screwing depth	$h_s =$	[mm]	75	
tolerance of the screwing depth		[mm]	$65 \leq h_s \leq 90$	
Thickness of non-loadbearing layer	$t_{tol} \leq$	[mm]	25	

¹⁾ Mz, KS, V and Vbl according to table B2.1

²⁾ See Annex A 1

Table B4.2: Installation parameters for hollow or perforated bricks¹⁾

Anchor size			RSD 10	
Drill hole diameter	$d_0 =$	[mm]	10	
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10,45	
Depth of drill hole to deepest point	$h_1 \geq$	[mm]	95	135
Drill method		[-]	Rotary drilling	
Overall plastic anchor embedment depth	$h_{nom} =$	[mm]	70	110 ³⁾
Diameter of clearance hole in the fixture (polymeric thread)	$d_f =$	[mm]	11,5	
Diameter of clearance hole in the fixture (stainless steel thread)	$d_f =$	[mm]	12,5	
Thickness of fixture (based on the nominal screwing depth)	$t_{fix} \geq$	[mm]	100	60
	$t_{fix} \leq$	[mm]	375	335
nominal screwing depth	$h_s =$	[mm]	75	115
tolerance of the screwing depth		[mm]	$65 \leq h_s \leq 90$	$105 \leq h_s \leq 130$
Thickness of non-loadbearing layer	$t_{tol} \leq$	[mm]	25	

¹⁾ HLz; KSL und Hbl according to table B2.1

²⁾ See Annex A 1

³⁾ only for the oblate version for hollow or perforated masonry

Rogger RSD-System Anchor

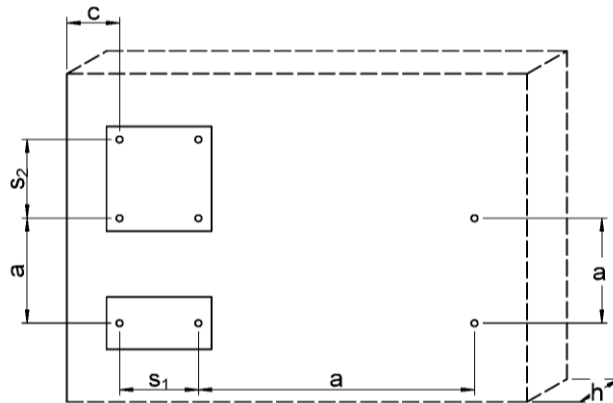
Intended use
Installation parameters for masonry

Annex B 4

Table B5.1: Minimum thickness of member, edge distance and anchor spacing in masonry

			RSD 10	
Nominal embedment depth	h_{nom}	[mm]	70	110
Minimum thickness of member	h_{min}	[mm]	125 ¹⁾	165 ¹⁾
Single anchor				
Minimum allowable spacing	a_{min}	[mm]	100	100
Minimum allowable edge distance	c_{min}	[mm]	100	100
Anchor group				
Spacing perpendicular to free edge	$s_{1,\text{min}}$	[mm]	100	100
Spacing parallel to free edge	$s_{2,\text{min}}$	[mm]	100	100
Minimum allowable edge distance	c_{min}	[mm]	100	100

¹⁾ depends on the brick size



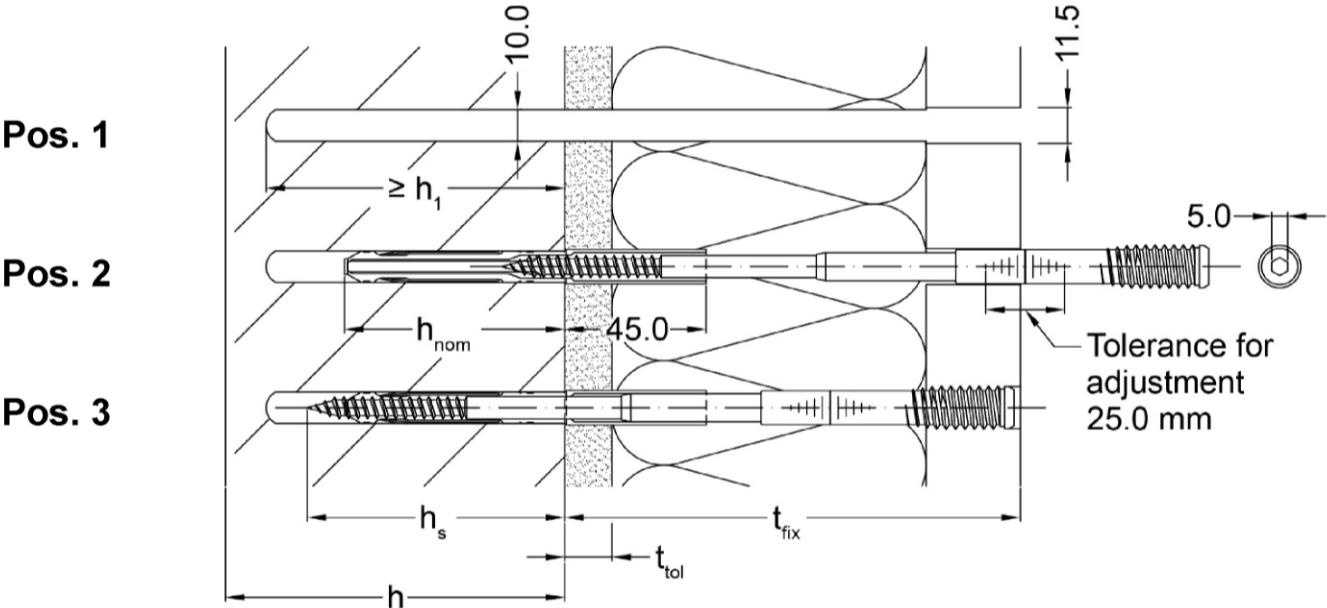
Minimum edge distance and spacing in masonry

Rogger RSD-System Anchor

Intended use

Edge distances and spacing for use in masonry

Annex B 5



Installation instructions special screw with polymeric thread

- provisional positioning of the battens at the designated place
- drilling of the wooden battens using a wood drill \varnothing 11,5 mm acc. to pos. 1
- drilling of the base material using a drill \varnothing 10 mm and a drilling method acc. to the base material (tables B3.1, B4.1, B4.2) acc. to pos. 1
- holes to be cleaned of drilling dust
- insertion of the pre-assembled anchor / screw combination in the drill hole; the surface of the battens has to be positioned within the rhombic label of the screw acc. to pos. 2
- accurate adjustment of the wooden battens
- screwing in the screw into the polymeric sleeve and the wooden battens until the head of the screw is at least flush with the surface of the battens or 2 mm underneath this surface at most acc. to pos. 3

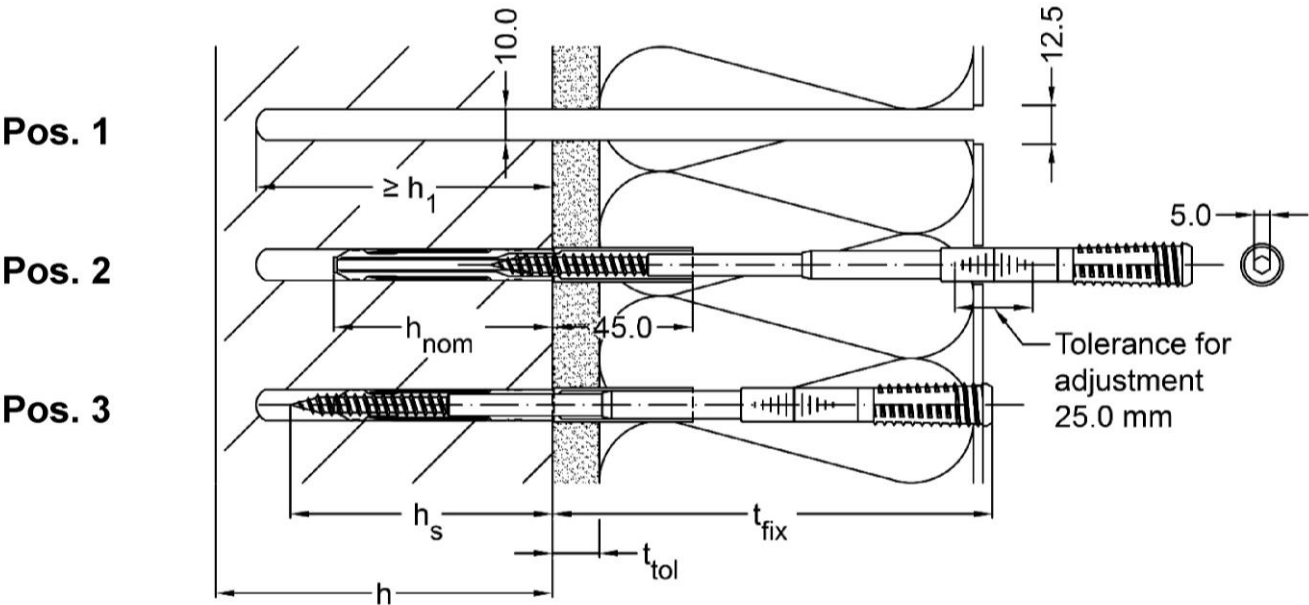
Determination of the required length of the screw

- screw length = $t_{fix} + h_s$
- h_s refer to tables B3.1, B4.1, B4.2

Rogger RSD-System Anchor

Intended use
Installation instructions (polymeric thread)

Annex B 6



Installation instructions special screw with stainless steel thread

- provisional positioning of the aluminium profile at the designated place
- drilling of the base material using a drill \varnothing 10 mm and a drilling jig, drilling method acc. to the base material (tables B3.1, B4.1, B4.2) acc. to pos. 1
- holes to be cleaned of drilling dust
- insertion of the pre-assembled anchor / screw combination in the drill hole; the surface of the aluminium profile has to be positioned within the rhombic label of the screw acc. to pos. 2
- accurate adjustment of the aluminium profile
- screwing in the screw into the polymeric sleeve and the aluminium profile until the head of the screw is rested on the surface of aluminium profile acc. to pos. 3

Determination of the required length of the screw

- screw length = $t_{fix} + h_s$
- h_s refer to tables B3.1, B4.1, B4.2

Rogger RSD-System Anchor

Intended use
Installation instructions (stainless steel thread)

Annex B 7

Table C1.1: Characteristic resistance of the special screw

Steel failure (special screw)			RSD 10
Characteristic tension resistance	$N_{Rk,s}$	[kN]	22,1
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,4
Characteristic shear resistance	$V_{Rk,s}$	[kN]	14,4
Characteristic bending resistance	$M_{Rk,s}$	[Nm]	40,4
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5

Table C1.2: Characteristic resistance for pull-out failure for use in concrete (use category „a“)

Pull-out failure (plastic sleeve)			
Concrete \geq C16/20			
Characteristic resistance	$30^{\circ}\text{C}^{2)} / 50^{\circ}\text{C}^{3)} N_{Rk,p}$	[kN]	3,5
	$50^{\circ}\text{C}^{2)} / 80^{\circ}\text{C}^{3)} N_{Rk,p}$	[kN]	2,5
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,8
Concrete C12/15			
Characteristic resistance	$30^{\circ}\text{C}^{2)} / 50^{\circ}\text{C}^{3)} N_{Rk,p}$	[kN]	2,5
	$50^{\circ}\text{C}^{2)} / 80^{\circ}\text{C}^{3)} N_{Rk,p}$	[kN]	2,0
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,8

¹⁾ In absence of other national regulations

²⁾ Maximum long term temperature

³⁾ Maximum short term temperature

Table C1.3: Characteristic resistance under fire exposure in concrete C20/25 to C50/60 in any load direction, no permanent centric tension load and without lever arm, fastening of façade systems

Fire resistance class	F_{Rk}
R 90	$\leq 0,8 \text{ kN}$

Table C1.4: Displacements¹⁾ under tension and shear loading in concrete and masonry

Anchor type	Tension load			Shear load		
	$F^{2)}$ [kN]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	$F^{2)}$ [kN]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]
RSD 10	1,4	0,26	0,30	1,4	0,67	1,01

¹⁾ Valid for all ranges of temperatures

²⁾ Intermediate values determined by linear interpolation

Rogger RSD-System Anchor

Performances

Characteristic resistance of the special screw, characteristic resistance in concrete, displacements

Annex C 1

Table C2.1: Characteristic resistance $F_{Rk}^{1)}$ in [kN] for single anchor in solid bricks (use category „b“)

Anchor size			RSD 10					
Temperature range			30°C ³⁾ / 50°C ⁴⁾			50°C ³⁾ / 80°C ⁴⁾		
Base Material			Mz	KS	V / Vbl	Mz	KS	V / Vbl
Solid brick, $f_b \geq 2 \text{ N/mm}^2$	$F_{Rk} =$	[kN]			0,5			0,4
Solid brick, $f_b \geq 4 \text{ N/mm}^2$	$F_{Rk} =$	[kN]			1,2			0,9
Solid brick, $f_b \geq 6 \text{ N/mm}^2$	$F_{Rk} =$	[kN]			1,5			1,2
Solid brick, $f_b \geq 10 \text{ N/mm}^2$	$F_{Rk} =$	[kN]	2,5	1,2		2,0	1,2	
Solid brick, $f_b \geq 20 \text{ N/mm}^2$	$F_{Rk} =$	[kN]	4,0	2,5		3,0	2,5	
Solid brick, $f_b \geq 28 \text{ N/mm}^2$	$F_{Rk} =$	[kN]		4,0			3,5	
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2,5					

Table C2.2: Characteristic resistance $F_{Rk}^{1)}$ in [kN] for single anchor in hollow or perforated bricks (use category „c“)

Anchor size			RSD 10					
Temperature range			30°C ³⁾ / 50°C ⁴⁾			50°C ³⁾ / 80°C ⁴⁾		
Base Material			HLz	KSL	Hbl	HLz	KSL	Hbl
Hollow brick, $f_b \geq 2 \text{ N/mm}^2$	$F_{Rk} =$	[kN]			0,30			
Hollow brick, $f_b \geq 4 \text{ N/mm}^2$	$F_{Rk} =$	[kN]	0,30		0,60			0,50
Hollow brick, $f_b \geq 6 \text{ N/mm}^2$	$F_{Rk} =$	[kN]	0,50	0,40	0,90	0,40	0,40	0,75
Hollow brick, $f_b \geq 8 \text{ N/mm}^2$	$F_{Rk} =$	[kN]	0,75	0,60		0,60	0,50	
Hollow brick, $f_b \geq 10 \text{ N/mm}^2$	$F_{Rk} =$	[kN]	0,90	0,75		0,75	0,60	
Hollow brick, $f_b \geq 12 \text{ N/mm}^2$	$F_{Rk} =$	[kN]	1,20	0,90		0,90	0,75	
Hollow brick, $f_b \geq 16 \text{ N/mm}^2$	$F_{Rk} =$	[kN]		1,20			0,90	
Hollow brick, $f_b \geq 20 \text{ N/mm}^2$	$F_{Rk} =$	[kN]		1,50			1,20	
Partial safety factor	$\gamma_{Mm}^{2)}$	[-]	2,5					

- 1) Characteristic resistance F_{Rk} for tension, shear or combined tension and shear loading.
 2) In absence of other national regulations
 3) Maximum long term temperature
 4) Maximum short term temperature

Rogger RSD-System Anchor

Performances

Characteristic resistance for use in solid bricks and in hollow or perforated bricks

Annex C 2