

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-21/0293
of 16 December 2022

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

ST Carbon K

Product family
to which the construction product belongs

Plastic anchor for fixing of external thermal insulation
composite systems with rendering

Manufacturer

DAW SE
Roßdörfer Straße 50
64372 Ober-Ramstadt
DEUTSCHLAND

Manufacturing plant

DAW 10183

This European Technical Assessment
contains

13 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-21/0293 issued on 9 April 2021

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

The screwed-in anchor ST Carbon K 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	See Annex C 1
- Minimum edge distance and spacing	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+

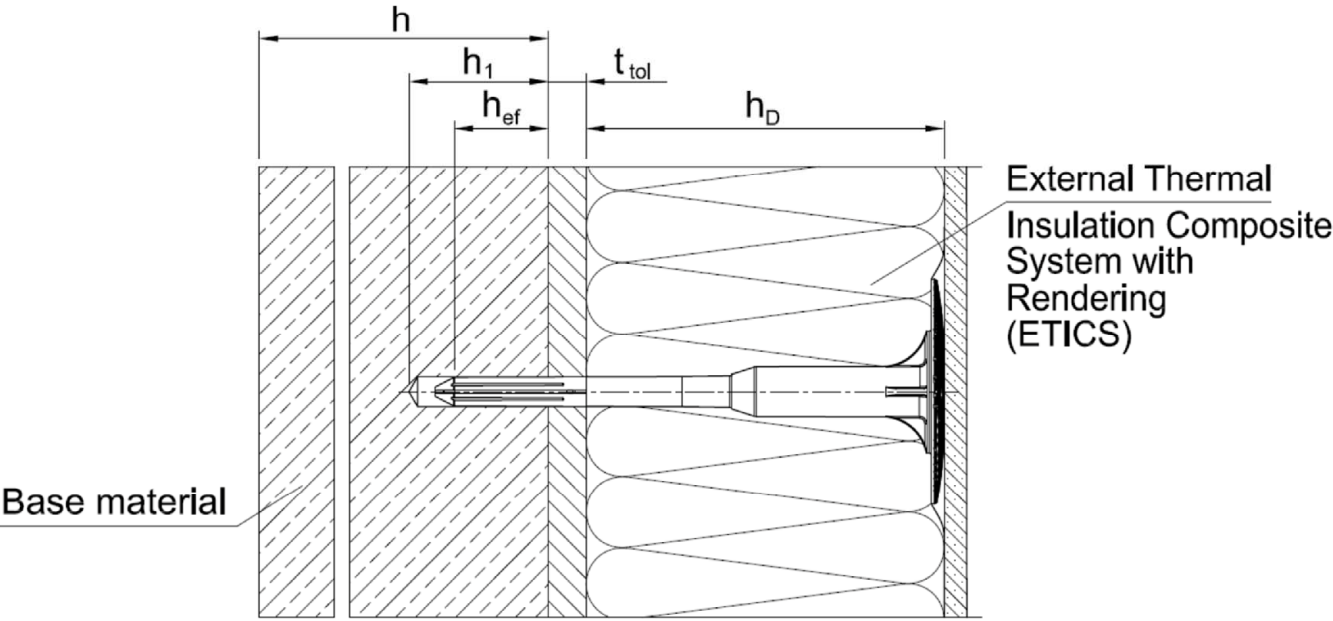
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

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 16 December 2022 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

beglaubigt:
Ziegler



Intended use

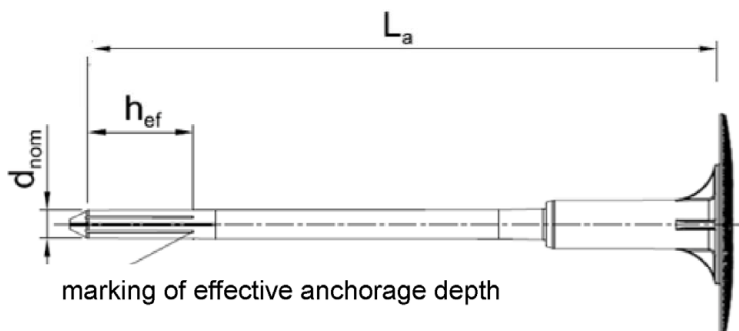
- Anchorage of ETICS in concrete and masonry
- Anchorage of ETICS in autoclaved aerated concrete and lightweight aggregate concrete

Legend:

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

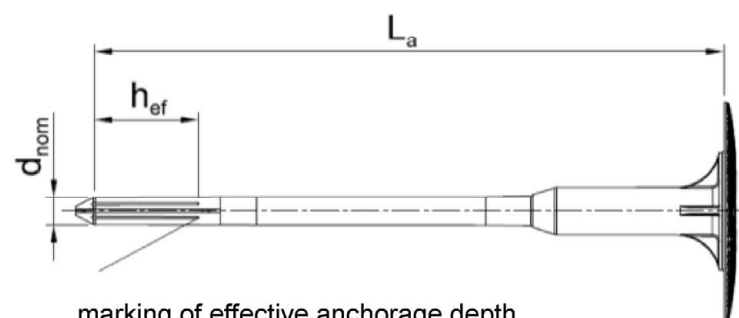
ST Carbon K	Annex A 1
Product description Installed condition	

ST Carbon K in base material group A, B, C, D / one and two-part anchor sleeve



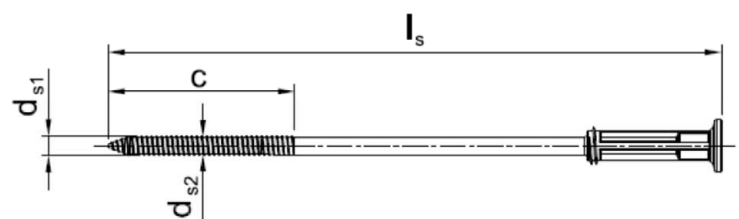
marking of effective anchorage depth

ST Carbon K: one-part anchor sleeve

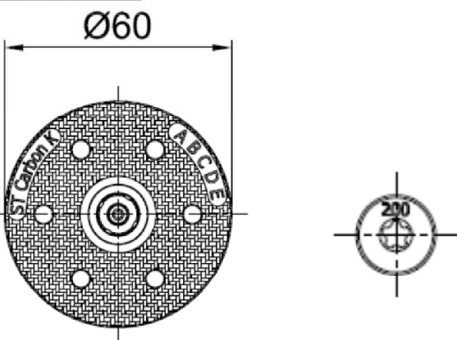


marking of effective anchorage depth

ST Carbon K: two-part anchor sleeve



ST Carbon K: plastic screw



Marking:

Anchor type (ST Carbon K)

Base material group (A, B, C, D, E)

Length of anchor (z.B. 200)

Table A1: Dimensions

Anchor Type	Anchor Sleeve			Plastic screw			
	d _{nom}	h _{ef}	min L _a max L _a	d _{s1}	d _{s2}	c	min l _s max l _s
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
ST Carbon K	8	30	100 300	5,7	5,0	55	100 300

Determination of maximum thickness of insulation h_D [mm] ST Carbon K:

$$\begin{aligned}
 h_D &= L_a - t_{tol} - h_{ef} \\
 \text{e.g. } h_D &= 200 - 10 - 30 \\
 h_{Dmax} &= 160
 \end{aligned}$$

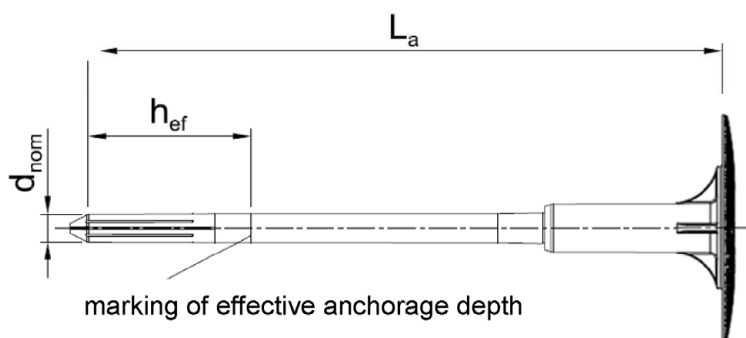
ST Carbon K

Product description

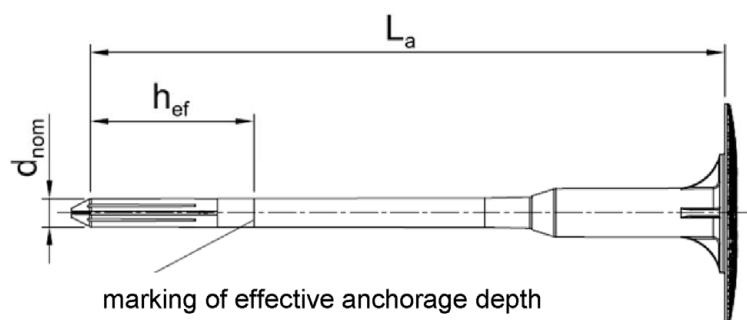
Marking and dimension of the one and two-part anchor sleeve ST Carbon K,
Base material group: A, B, C, D; plastic screw

Annex A 2

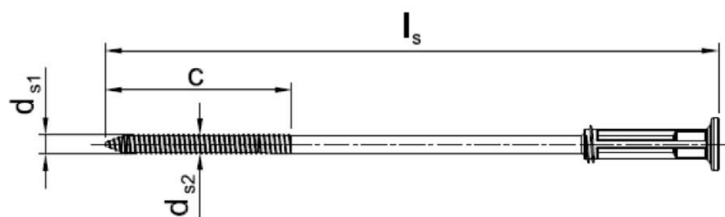
ST Carbon K in base material group E / one and two-part anchor sleeve



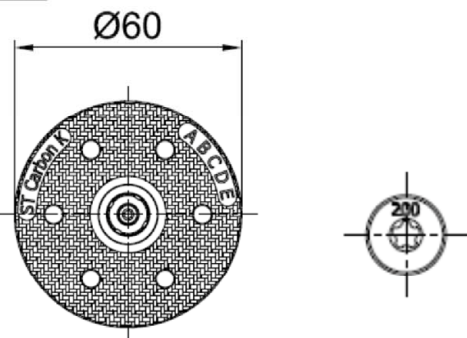
ST Carbon K, one-part anchor sleeve



ST Carbon K, two-part anchor sleeve



ST Carbon K: plastic screw



Marking:
Anchor type (ST Carbon K)
Base material group (A, B, C, D, E)
Length of anchor (z.B. 200)

Table A2: Dimensions

Anchor Type	Anchor Sleeve			Plastic screw			
	d _{nom}	h _{ef}	min L _a max L _a	d _{s1}	d _{s2}	c	min l _s max l _s
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
ST Carbon K	8	50	100 300	5,7	5,0	55	100 300

Determination of maximum thickness of insulation h_D [mm] ST Carbon K:

$$\begin{aligned}
 h_D &= L_a - t_{tol} - h_{ef} \\
 \text{e.g. } h_D &= 200 - 10 - 50 \\
 h_{Dmax} &= 140
 \end{aligned}$$

ST Carbon K

Product description

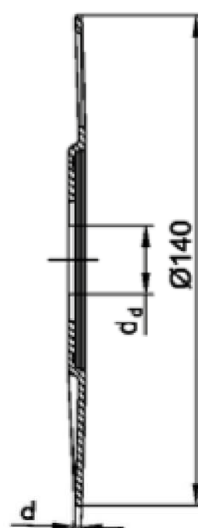
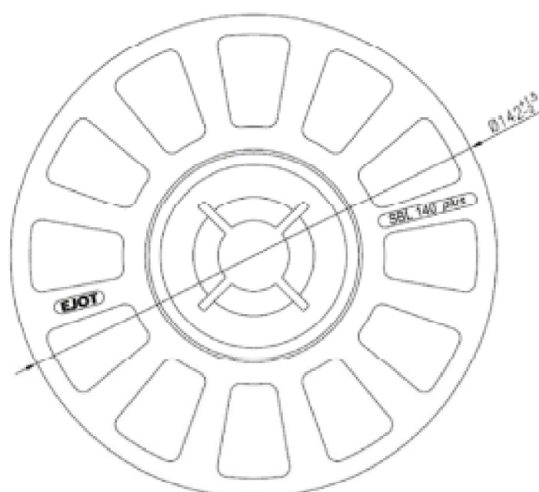
Marking and dimension of the one and two-part anchor sleeve ST Carbon K,
Base material group: E, plastic screw

Annex A 3

Table A3: Materials ST Carbon K

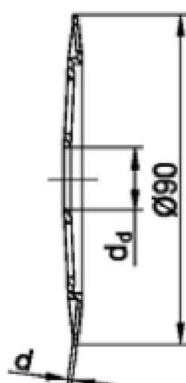
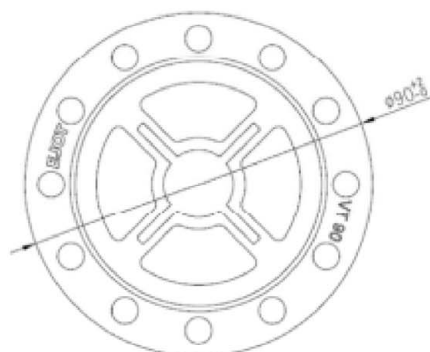
Designation	material
Anchor plate	Polyethylene (virgin material) PE-HD colour: anthracite
Anchor sleeve	Polyethylene (virgin material) PE-HD Colour: anthracite
Plastic screw	Polyamide (virgin material) PA 6 GF 50 colour: anthracite, black
Slip-on plate SBL 140 plus, VT 90	Polyamide (virgin material) PA 6 or PA 6 GF 50 Colour: nature

SBL 140 plus



SBL 140 plus		
d _d	[mm]	21,0
d	[mm]	2,0

VT 90



VT 90		
d _d	[mm]	18,5
d	[mm]	1,2

ST Carbon K

Product description
Materials and slip on plates

Annex A 4

Specifications of intended use

Anchorage subject to:

- The anchor may only be used for transmission of wind suction loads and shall not be used for the transmission of dead loads of the thermal insulation composite system.

Base materials:

- Normal weight concrete (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 the base material group 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 $\gamma_m = 2,0$ and $\gamma_F = 1,5$ if there are no other regulations.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings.
- Fasteners are only to be used for multiple fixings of thermal insulation composite systems.

Installation:

- Hole drilling by the drill modes according to Annex C1.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Installation temperature from 0°C to +40°C
- Exposure to UV due to solar radiation of the anchor not protected by rendering ≤ 6 weeks

ST Carbon K

Intended use
Specifications

Annex B 1

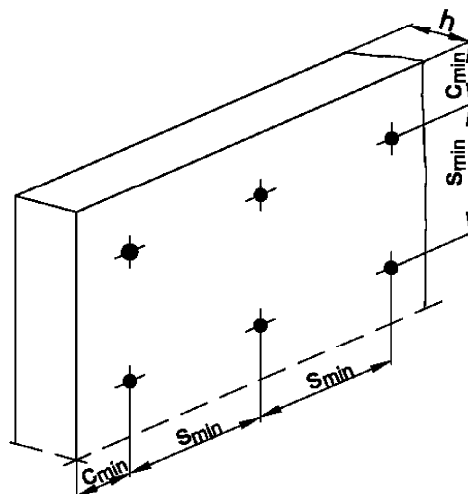
Table B1: Installation parameters

Anchor type		ST Carbon K	
		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		ST Carbon K	
Minimum spacing	$s_{min} \geq$ [mm]	100	
Minimum edge distance	$c_{min} \geq$ [mm]	100	
Minimum thickness of member	$h \geq$ [mm]	100	

Scheme of distance and spacing



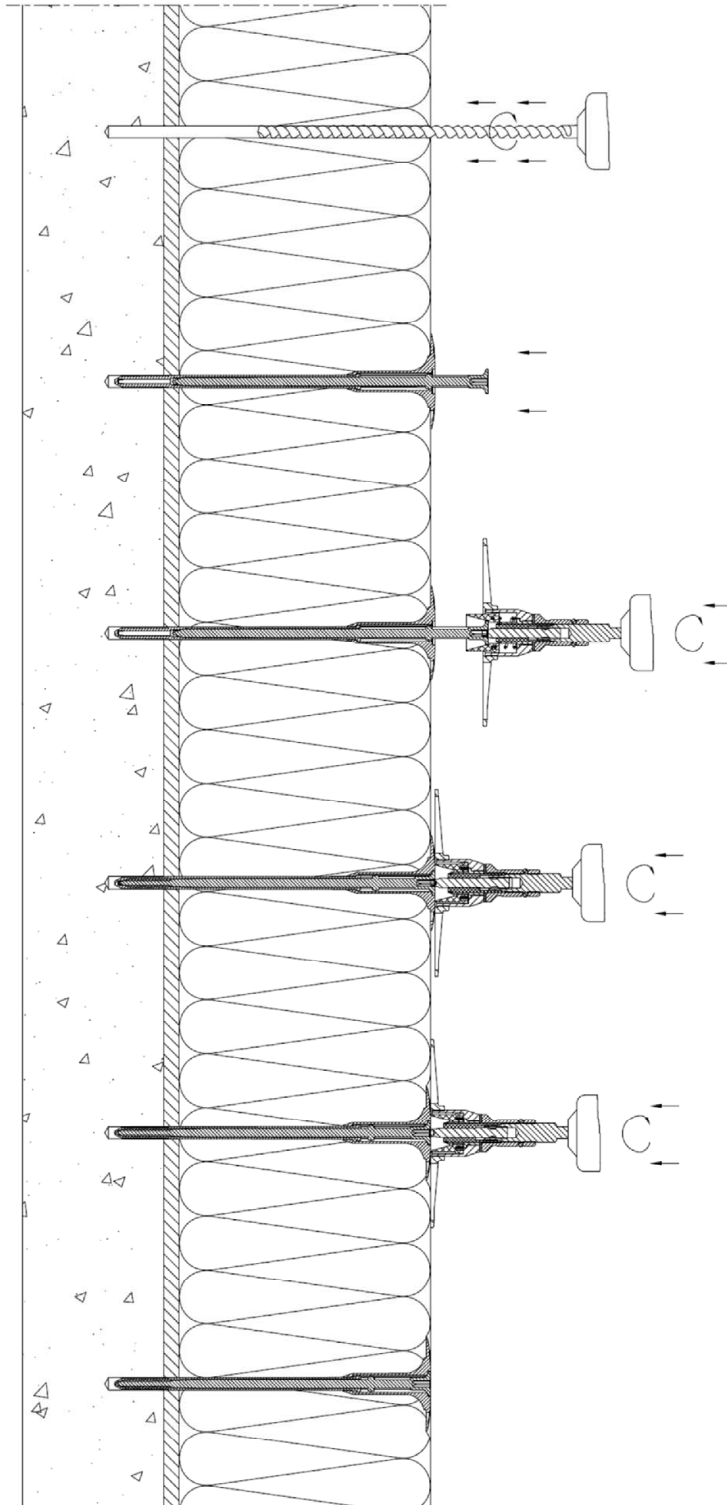
ST Carbon K

Intended Use

Installations parameters,
Edge distances and spacing

Annex B 2

Installation instructions: ST Carbon K



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 ST Carbon K.

ST Carbon K

Intendend Use
Installation instructions ST Carbon K

Annex B 3

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

Anchor type					ST Carbon K
Base materials	Bulk density ρ [kg/dm ³]	Minimum compressive strength f_b [N/mm ²]	General remarks	Drill method	N_{Rk} [kN]
Concrete C12/15 – C50/60 as per EN 206:2013+A1:2016			Compacted normal weight concrete without fibres	hammer	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
Clay bricks, Mz as per EN 771-1:2011+A1:2015	≥ 1,8	12	Vertically perforation ⁴⁾ up to 15%	hammer	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
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⁾
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⁾
Lightweight concrete hollow blocks, Hbl as per EN 771-3:2011+A1:2015	≥ 1,2	6		hammer / rotary	0,9 ³⁾
lightweight aggregate concrete LAC, as per EN 1520:2011 EN 771-3:2011+A1:2015	≥ 0,7	4		rotary	0,9
Autoclaved aerated concrete as per EN 771-4:2011+A1:2015	≥ 0,55	4		rotary	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

ST Carbon K

Performances
Characteristic resistance

Annex C 1

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]
ST Carbon K	60	0,001
	80 – 260	0,000

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]
ST Carbon K	60	1,5	0,7

Table C4: Displacements

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

ST Carbon K

Performances

Point thermal transmittance, plate stiffness, displacements

Annex C 2