

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 <ul style="list-style-type: none"> <li>- Characteristic resistance under tension load</li> <li>- Minimum edge distance and spacing</li> </ul> | See Annex C 1<br>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+

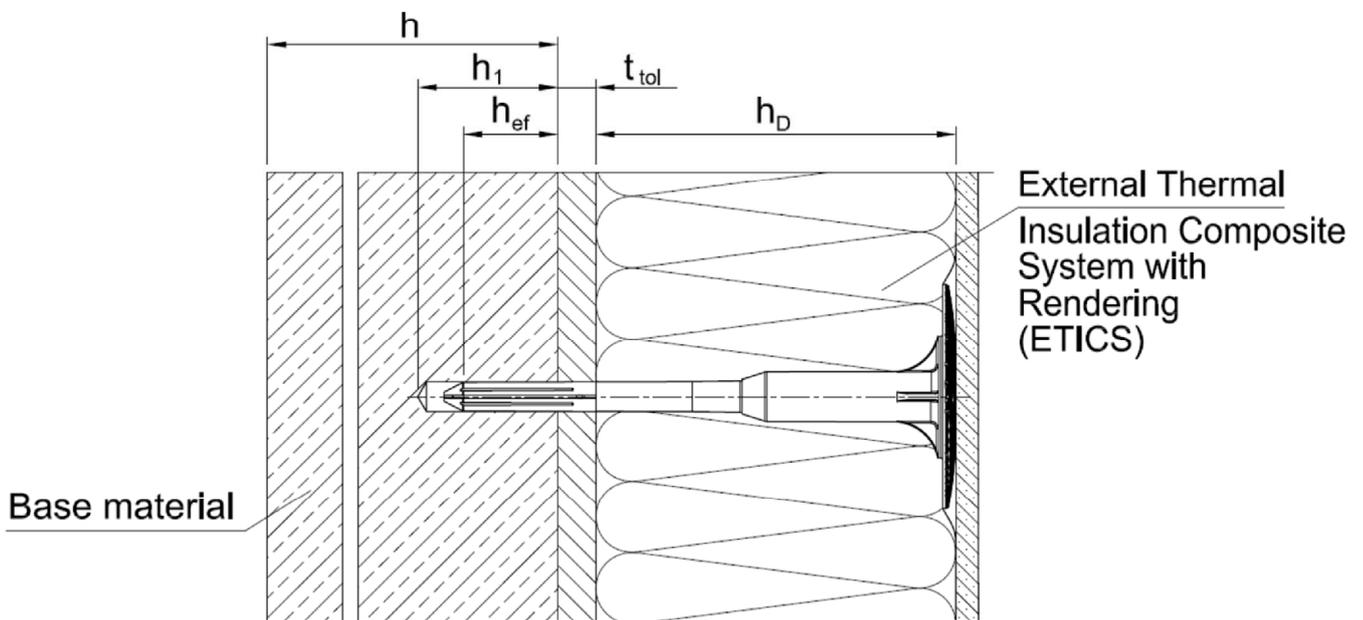
**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document**

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:**

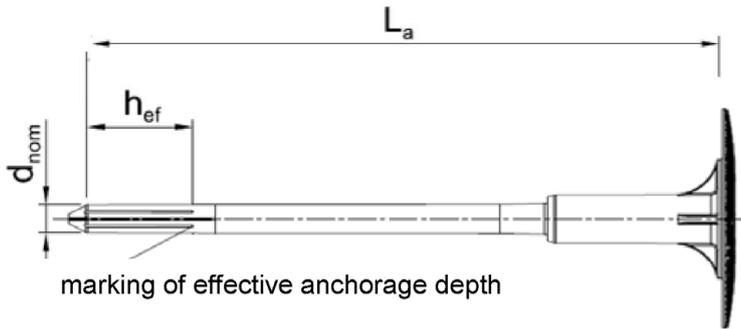
- $h_D$  = thickness of insulation material
- $h_{ef}$  = effective anchorage depth
- $h$  = thickness of member (wall)
- $h_1$  = depth of drilled hole to deepest point
- $t_{tol}$  = thickness of equalizing layer or non-load-bearing coating

**ST Carbon K**

**Product description**  
Installed condition

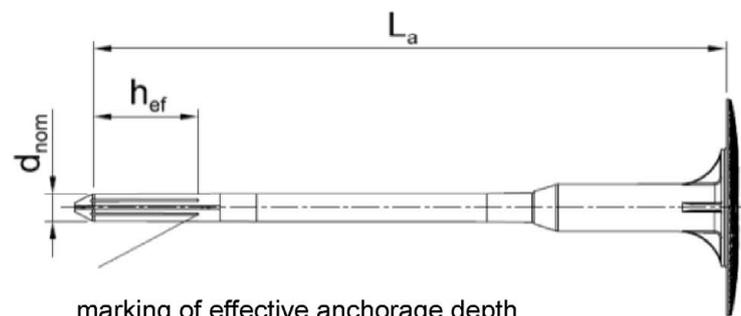
**Annex A 1**

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



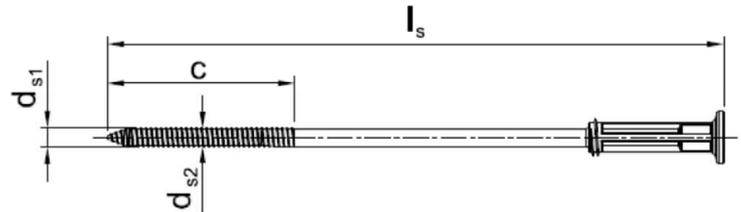
marking of effective anchorage depth

ST Carbon K: one-part anchor sleeve

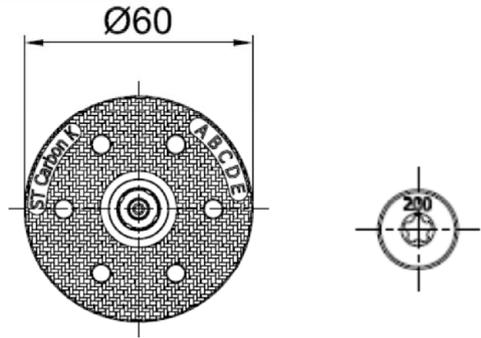


marking of effective anchorage depth

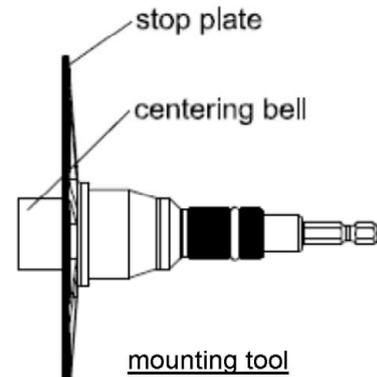
ST Carbon K: two-part anchor sleeve



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)



mounting tool

**Table A1: Dimensions**

| Anchor Type | Anchor Sleeve            |                         |  | Plastic screw           |                         |           |  |
|-------------|--------------------------|-------------------------|--|-------------------------|-------------------------|-----------|--|
|             | d <sub>nom</sub><br>[mm] | h <sub>ef</sub><br>[mm] | min L <sub>a</sub><br>max L <sub>a</sub><br>[mm] | d <sub>s1</sub><br>[mm] | d <sub>s2</sub><br>[mm] | c<br>[mm] | min l <sub>s</sub><br>max l <sub>s</sub><br>[mm] |
| ST Carbon K | 8                        | 30                      | 100<br>300                                       | 5,7                     | 5,0                     | 55        | 100<br>300                                       |

Determination of maximum thickness of insulation h<sub>D</sub> [mm] ST Carbon K:

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

e.g.  $h_D = 200 - 10 - 30$   
 $h_{Dmax} = 160$

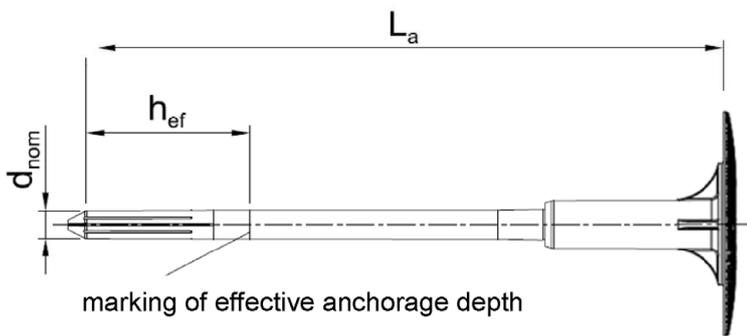
**ST Carbon K**

**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

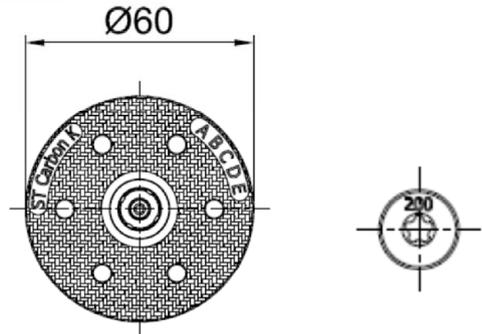
**Annex A 2**

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



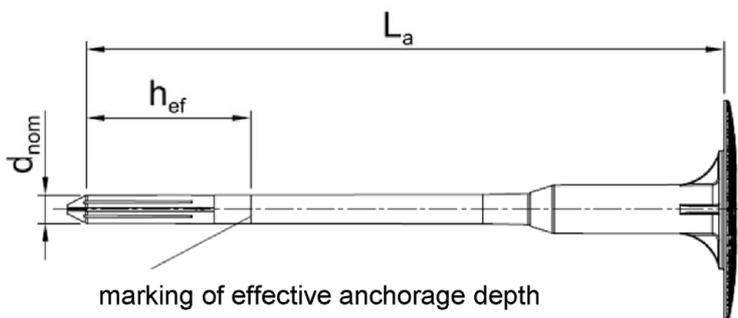
marking of effective anchorage depth

ST Carbon K, one-part anchor sleeve



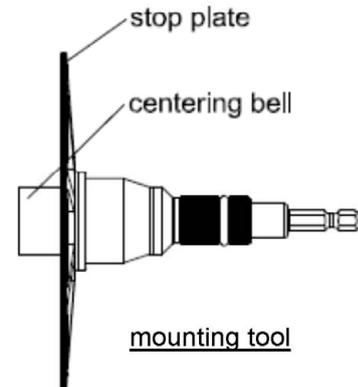
Marking:

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

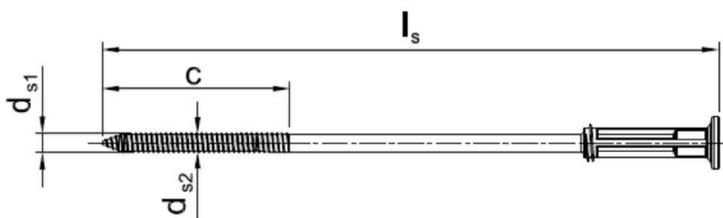


marking of effective anchorage depth

ST Carbon K, two-part anchor sleeve



mounting tool



ST Carbon K: plastic screw

**Table A2: Dimensions**

| Anchor Type | Anchor Sleeve            |                         |  | Plastic screw           |                         |           |  |
|-------------|--------------------------|-------------------------|--|-------------------------|-------------------------|-----------|--|
|             | d <sub>nom</sub><br>[mm] | h <sub>ef</sub><br>[mm] | min L <sub>a</sub><br>max L <sub>a</sub><br>[mm] | d <sub>s1</sub><br>[mm] | d <sub>s2</sub><br>[mm] | c<br>[mm] | min l <sub>s</sub><br>max l <sub>s</sub><br>[mm] |
| ST Carbon K | 8                        | 50                      | 100<br>300                                       | 5,7                     | 5,0                     | 55        | 100<br>300                                       |

Determination of maximum thickness of insulation h<sub>D</sub> [mm] ST Carbon K:

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

e.g.  $h_D = 200 - 10 - 50$   
 $h_{Dmax} = 140$

**ST Carbon K**

**Product description**

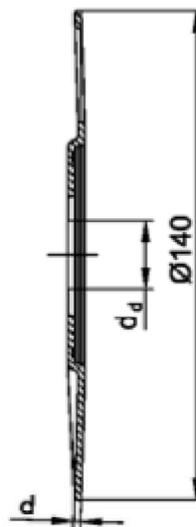
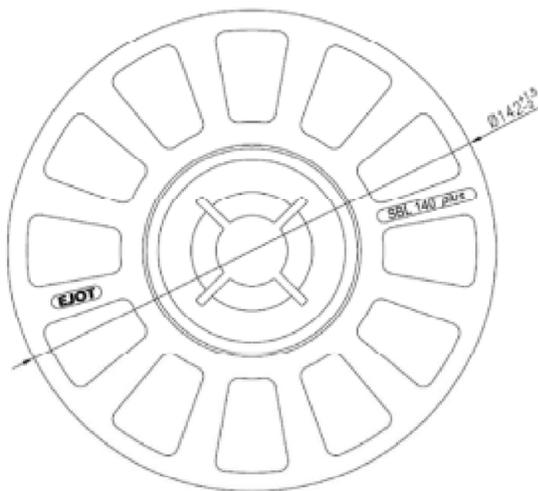
Marking and dimension of the one and two-part anchor sleeve ST Carbon K,  
Base material group: E, plastic screw

**Annex A 3**

**Table A3: Materials ST Carbon K**

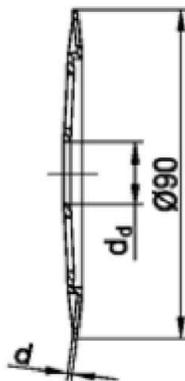
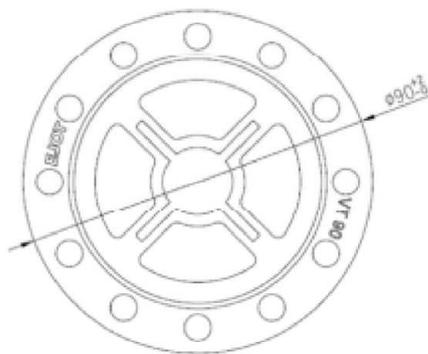
|                                      |   |
|--------------------------------------|---|
| Designation                          | material  |
| Anchor plate                         | Polyethylene (virgin material) PE-HD<br>colour: anthracite          |
| Anchor sleeve                        | Polyethylene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

**SBL 140 plus**



| SBL 140 plus        |      |
|---------------------|------|
| d <sub>d</sub> [mm] | 21,0 |
| d [mm]              | 2,0  |

**VT 90**



| VT 90               |      |
|---------------------|------|
| d <sub>d</sub> [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  $\leq 6$  weeks

ST Carbon K

Intended use  
Specifications

Annex B 1

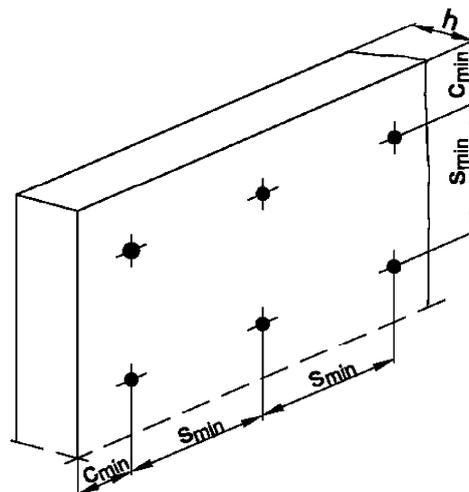
**Table B1: Installation parameters**

|  |                     |            |      |
|--|---------------------|------------|------|
| 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

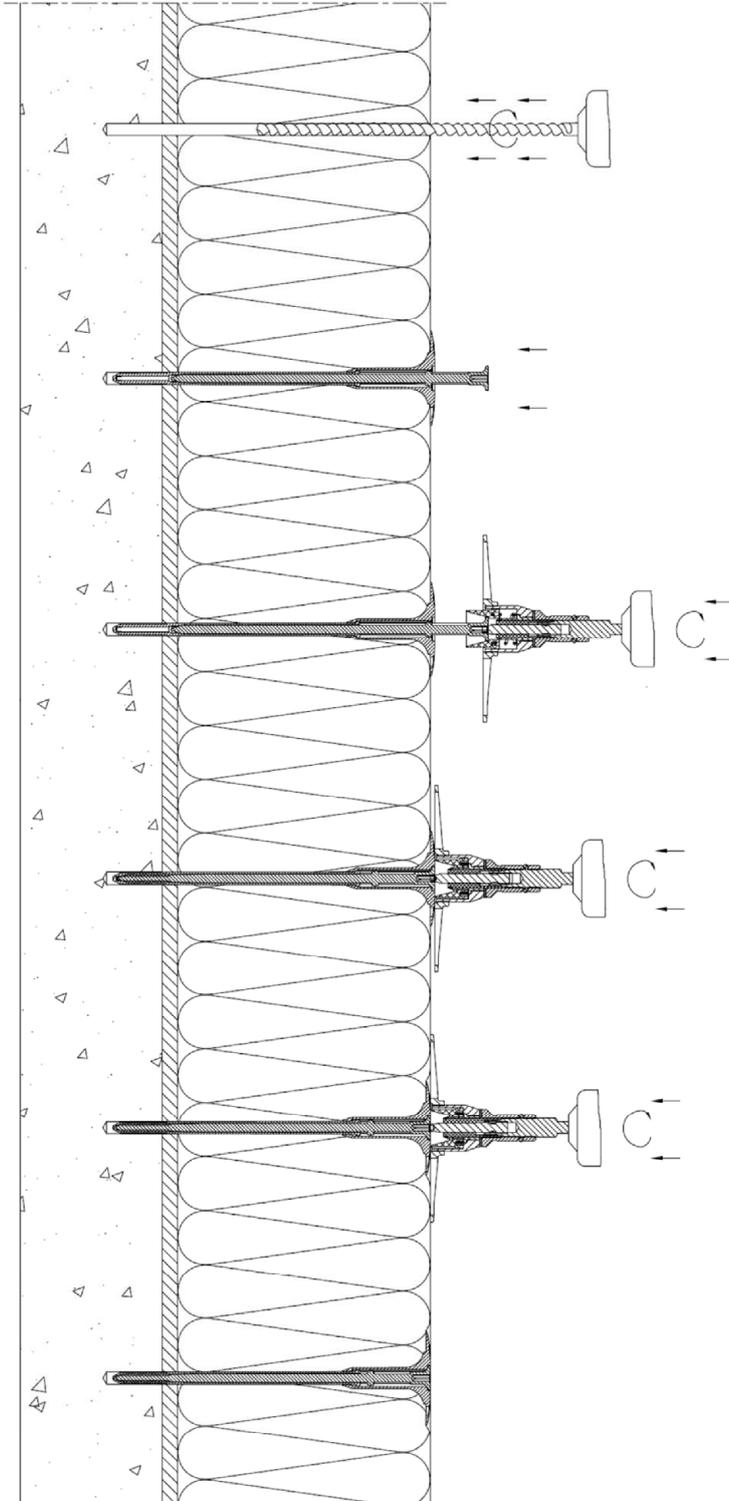


**ST Carbon K**

**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**

| <b>Table C1: Characteristic resistance to tension loads <math>N_{Rk}</math> in concrete and masonry for a single anchor in kN</b> |   |   |   |                 |                   |
|---|---|---|---|-----------------|-------------------|
| Anchor type   |   |   |   |                 | ST Carbon K       |
| Base materials  | Bulk density $\rho$ [kg/dm <sup>3</sup> ] | Minimum compressive strength $f_b$ [N/mm <sup>2</sup> ] | 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<br>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 <sup>4)</sup> up to 15%  | hammer          | 1,5               |
| Sand-lime solid bricks, KS as per EN 771-2:2011+A1:2015   | ≥ 1,8                                     | 12  | Vertically perforation <sup>4)</sup> up to 15%  | hammer          | 1,5               |
| Vertically perforated clay bricks, HLz, as per EN 771-1:2011+A1:2015  | ≥ 1,6                                     | 20  | Vertically perforation <sup>4)</sup> > 15 % and ≤ 50 %.   | hammer / rotary | 1,5 <sup>1)</sup> |
| Sand-lime perforated bricks, KSL, as per EN 771-2:2011+A1:2015  | ≥ 1,6                                     | 12  | Vertically perforation <sup>4)</sup> > 15 % and ≤ 50 %.   | hammer / rotary | 1,5 <sup>2)</sup> |
| Lightweight concrete hollow blocks, Hbl as per EN 771-3:2011+A1:2015  | ≥ 1,2                                     | 6   |   | hammer / rotary | 0,9 <sup>3)</sup> |
| 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              |
| <b>ST Carbon K</b>  |   |   |   |                 | <b>Annex C 1</b>  |
| <b>Performances</b><br>Characteristic resistance  |   |   |   |                 |                   |

- 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

**Table C2: Point thermal transmittance according EOTA Technical Report TR 025:2016-05**

| anchor type | insulation thickness<br>$h_D$<br>[mm] | point thermal transmittance<br>$\chi$<br>[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<br>of the anchor plate<br>[mm] | load resistance<br>of the anchor plate<br>[kN] | plate stiffness<br>[kN/mm] |
|-------------|---|--|----------------------------|
| ST Carbon K | 60                                      | 1,5  | 0,7                        |

**Table C4: Displacements**

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