Deutsches Institut für Bautechnik

Public-law institution jointly founded by the federal states and the Federation

European Technical Assessment Body for construction products

Member of EOTA
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Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

# European Technical Assessment ETA-24/0781 of 11 April 2025

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 | Selkent SEL-V410+ for masonry |
| Product family to which the construction product belongs | Metal Injection anchors for use in masonry |
| Manufacturer | Selkent, Osprey House,<br>New Mill Road<br>BR5 3QJ Orpington, London<br>GROSSBRITANNIEN |
| Manufacturing plant | Werk Selkent |
| This European Technical Assessment contains | 158 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 330076-01-0604-v01, Edition 03/2024 |

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## Specific Part

### 1 Technical description of the product

The injection system Selkent SEL-V+ for masonry is a bonded anchor (injection type) consisting of a mortar cartridge with injection mortar Selkent SEL-V+, a perforated sieve sleeve and an anchor rod with hexagon nut and washer or an internal threaded rod. The steel elements are made of zinc coated steel, stainless steel or high corrosion resistant steel.

The anchor rod is placed into a drilled hole filled with injection mortar and is anchored via the bond between steel element, injection mortar and masonry and mechanical interlock.

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 fastener 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 fastener 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)

| Essential characteristic | Performance |
|---|---|
| Characteristic resistance for static and quasi-static loading | See Annexes B4 to B7, B21, B22, C1 to C123 |
| Characteristic resistance and displacements for seismic loading | No performance assessed |

#### 3.2 Safety in case of fire (BWR 2)

| Essential characteristic | Performance |
|---|---|
| Reaction to fire | Class A1 |
| Resistance to fire under tension and shear loading with and without lever arm. Minimum edge distances and spacing | See Annex C124 to C127 |

#### 3.3 Hygiene, health and the environment (BWR 3)

| Essential characteristic | Performance |
|---|---|
| Content, emission and/or release of dangerous substances | No performance assessed |

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

In accordance with the European Assessment Document EAD 330076-01-0604-v01 the applicable European legal act is: [97/177/EC].

The system to be applied is: 1

## 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 11 April 2025 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

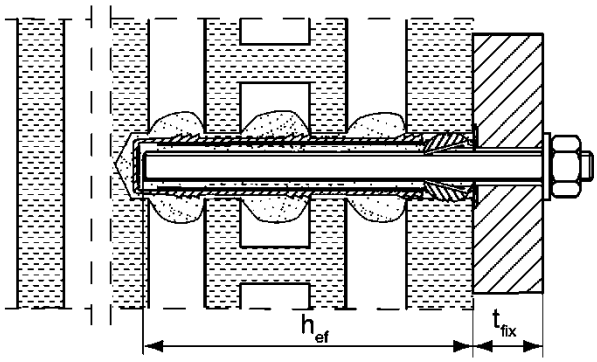
*beglaubigt:*
Baderschneider

Deutsches Institut für Bautechnik DIBt

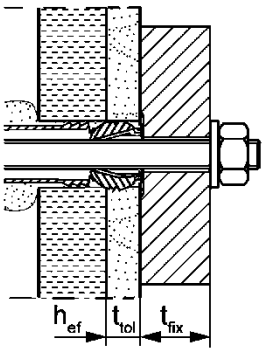
## Installation conditions part 1

**Anchor rods with Selkent perforated sleeve H K; Installation in perforated and solid brick masonry**

**Pre-positioned installation:**

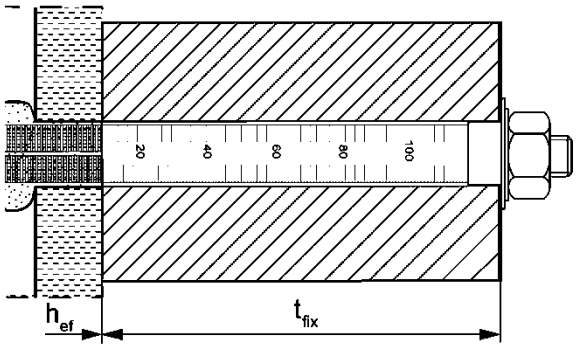



Installation with render bridge

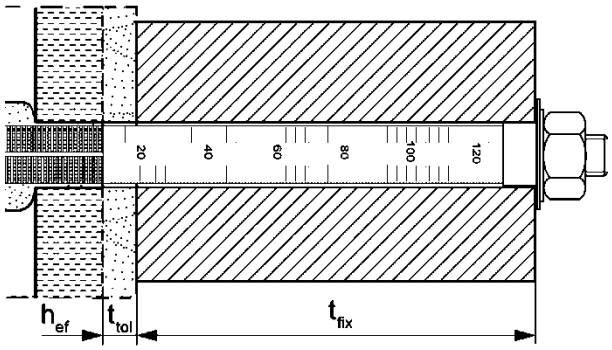



**Size of the perforated sleeve:** Selkent H 12x50 K, Selkent H 12x85 K, Selkent H 16x85 K, Selkent H 16x130 K, Selkent H 20x85 K, Selkent H 20x130 K, Selkent H 20x200 K

**Push through installation:**



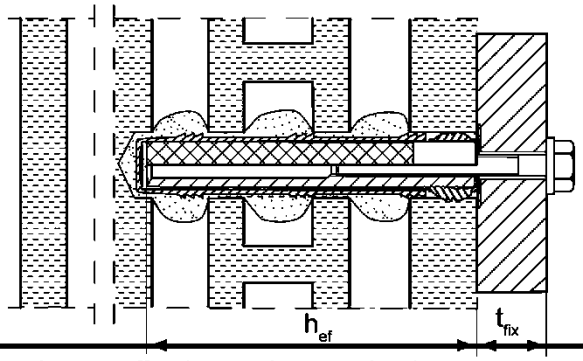

Installation with render bridge




**Size of the perforated sleeve:** Selkent H 18x130/200 K, Selkent H 22x130/200 K

**Selkent internal threaded anchor E with Selkent perforated sleeve H K; Installation in perforated and solid brick masonry**

**Pre-positioned installation:**




Figures not to scale

$h_{ef}$ = effective anchorage depth
$t_{tol}$ = thickness of unbearing layer (e.g. plaster)
$t_{fix}$ = thickness of fixture

Injection system Selkent SEL-V+ for masonry

**Product description**
Installation conditions part 1,
Anchor rods and internal threaded anchor with perforated sleeve

**Annex A1**

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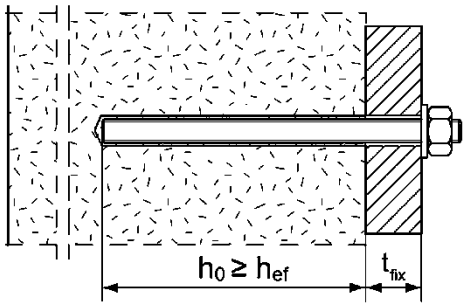
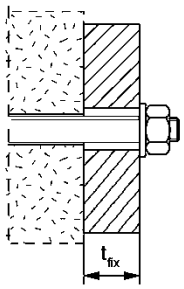
## Installation conditions part 2

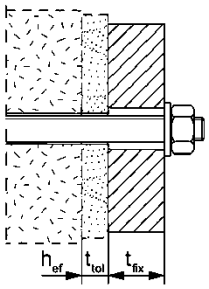
**Anchor rods without Selkent perforated sleeve H K;
installation in solid brick masonry and autoclaved aerated concrete**

**Pre-positioned installation:**




**Push through installation:** Annular gap filled with mortar

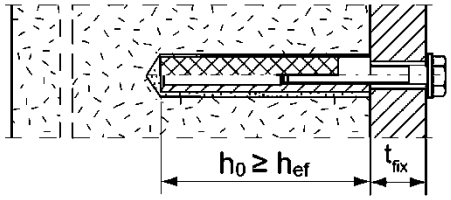


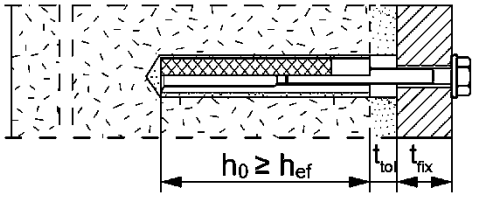

Installation with render bridge

**Selkent internal threaded anchors E without Selkent perforated sleeve H K;
installation in solid brick masonry and autoclaved aerated concrete**

**Pre-positioned installation:**

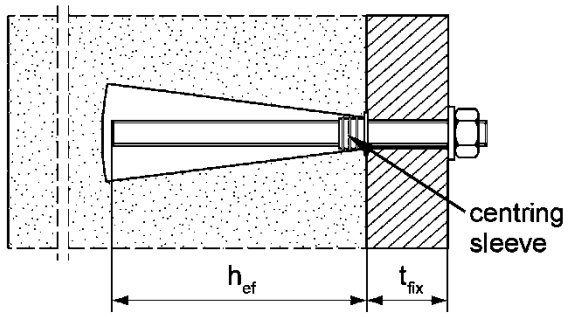



Installation with render bridge

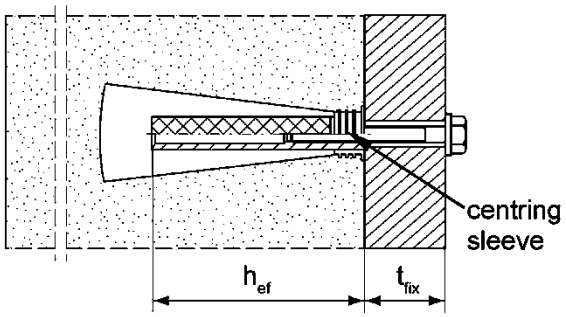



**Anchor rods and Selkent internal threaded anchors E without Selkent perforated sleeve H K; installation with centring sleeve in autoclaved aerated concrete with conical drill hole (installation with special conic drill bit PBB)**

**Pre-positioned installation:**
anchor rods M8, M10, M12




**Pre-positioned installation:**
Selkent internal threaded anchor E 11x85 M6 / M8




Figures not to scale

$h_0$ = depth of drill hole
$h_{ef}$ = effective anchorage depth
$t_{tol}$ = thickness of unbearing layer (e.g. plaster)
$t_{fix}$ = thickness of fixture

Injection system Selkent SEL-V+ for masonry

**Product description**
Installation conditions part 2, Anchor rods and internal threaded anchor without perforated sleeve / with centring sleeve

**Annex A2**

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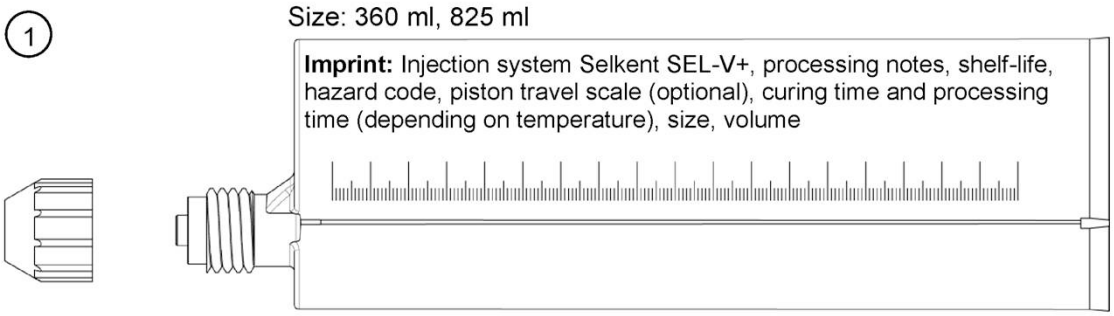
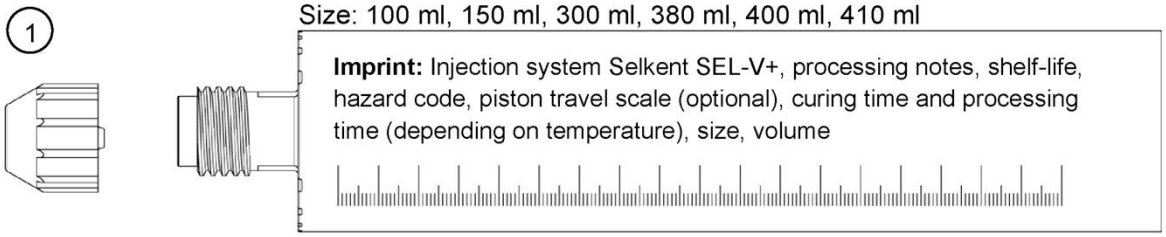
## Overview system components part 1

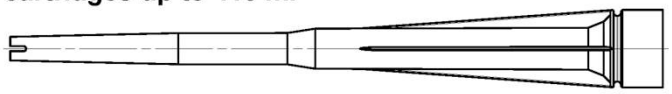
**Mortar cartridge (shuttle cartridge) with sealing cap**



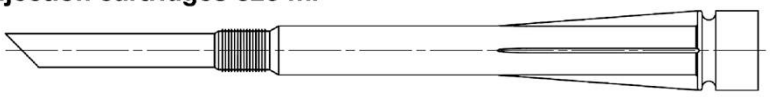

**Mortar cartridge (coaxial cartridge) with sealing cap**



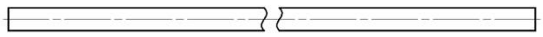

**Static mixer Selkent-V+ for injection cartridges up to 410 ml**



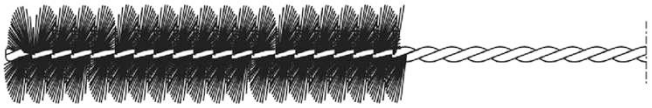
**Static mixer Selkent-V+ for injection cartridges 825 ml**



**Extension tube Ø 9 for static mixer Selkent-V+;**
**Extension tube Ø 9 or Ø 15 for static mixer Selkent-V+**



**Selkent Cleaning brush**



**Selkent blow-out pump**

**Selkent compressed-air cleaning tool**

Figures not to scale

| Injection system Selkent SEL-V+ for masonry | **Annex A3** |
|---|---|
| **Product description**<br>Overview system components part 1: cartridge / static mixer / cleaning tools | |

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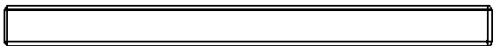
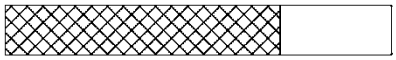
## Overview system components part 2

**Selkent anchor rod**

(2) 

Size: M6, M8, M10, M12, M16

**Selkent internal threaded anchor E**

(5) 

Size: 11x85 M6 / M8
15x85 M10 / M12

**Selkent perforated sleeve H K**

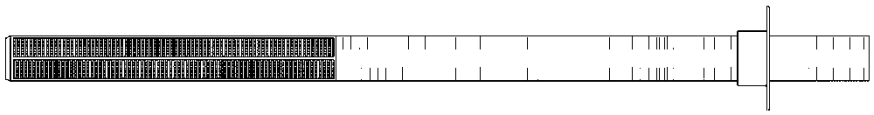
(7) 

Size: Selkent H 12x50 K
Selkent H 12x85 K
Selkent H 16x85 K
Selkent H 20x85 K

(7) 

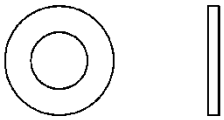
Size: Selkent H 16x130 K
Selkent H 20x130 K
Selkent H 20x200 K

**Selkent perforated sleeve H K (push through installation)**

(7) 

Size:
Selkent H 18x130/200 K
Selkent H 22x130/200 K

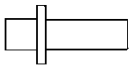
**Washer**

(3) 

**Hexagon nut**

(4) 

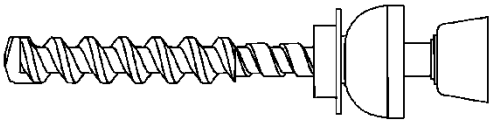
**Injection adapter**



**centring sleeve PBZ**

(7) 

**Special conic drill bit PBB**



Figures not to scale

| Injection system Selkent SEL-V+ for masonry | Annex A4 |
|---|---|
| **Product description**<br>Overview system components part 2: steel parts / perforated sleeve / conical drill bit / Injection adapter / centring sleeve | |

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**Table A5.1: Materials**

| Part | Designation | Material | | |
|---|---|---|---|---|
| 1 | Mortar cartridge | Mortar, hardener; filler | | |
| | | Steel | Stainless steel R | High corrosion resistant steel HCR |
| | | zinc plated | acc. to EN 10088-1:2023 Corrosion resistance class CRC III acc. to EN 1993-1-4:2006+A1:2015 | acc. to EN 10088-1:2023 Corrosion resistance class CRC V acc. to EN 1993-1-4:2006+A1:2015 |
| 2 | Anchor rod | Property class 4.6; 4.8; 5.8 or 8.8; EN ISO 898-1: 2013 zinc plated ≥ 5µm, ISO 4042:2022 or hot-dip galvanised EN ISO 10684:2004+AC:2009 $f_{uk} \leq 1000$ N/mm² $A_5 > 8\%$ fracture elongation | Property class 50, 70 or 80 EN ISO 3506-1:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; 1.4062; 1.4662; 1.4462; EN 10088-1:2023 $f_{uk} \leq 1000$ N/mm² $A_5 > 8\%$ fracture elongation | Property class 50 or 80 EN ISO 3506-1:2020 or property class 70 with $f_{yk}$= 560 N/mm² 1.4565; 1.4529 EN 10088-1:2023 $f_{uk} \leq 1000$ N/mm² $A_5 > 8\%$ fracture elongation |
| 3 | Washer ISO 7089:2000 | zinc plated ≥ 5µm, ISO 4042:2022 or hot-dip galvanised EN ISO 10684:2004+AC:2009 | 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023 | 1.4565;1.4529 EN 10088-1:2023 |
| 4 | Hexagon nut | Property class 5 or 8; EN ISO 898-2:2022 zinc plated ≥ 5µm, ISO 4042:2022 or hot-dip galvanised EN ISO 10684:2004+AC:2009 | Property class 50, 70 or 80 EN ISO 3506-2:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023 | Property class 50, 70 or 80 EN ISO 3506-2:2020 1.4565; 1.4529 EN 10088-1:2023 |
| 5 | Selkent internal threaded anchor E | Property class 5.8; EN ISO 898-1:2013 zinc plated ≥ 5µm, ISO 4042:2022 | Property class 70 EN ISO 3506-1:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023 | Property class 70 EN ISO 3506-1:2020 1.4565; 1.4529 EN 10088-1:2023 |
| 6 | Commercial standard screw or threaded rod for Selkent internal threaded anchor E | Property class 4.6, 5.8 or 8.8; EN ISO 898-1:2013 zinc plated ≥ 5µm, ISO 4042:2022 | Property class 70 EN ISO 3506-1:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023 | Property class 70 EN ISO 3506-1:2020 1.4565; 1.4529 EN 10088-1:2023 |
| 7 | Perforated sleeve and centring sleeve | PP / PE | | |

Injection system Selkent SEL-V+ for masonry

**Product description**
Materials

**Annex A5**

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## Specifications of intended use part 1

**Table B1.1**: Overview use and performance categories

| Anchorages subject to | | **Injection system Selkent SEL-V+ for masonry** | |
|---|---|---|---|
| Hole drilling with hammer drill mode | | all bricks;<br>without C32 to C51, C80 to C83 | |
| Hole drilling with rotary drill mode | | all bricks | |
| Hole drilling with special conic drill bit | | Only C118 to C122 | |
| Static and quasi static load, in masonry | | all bricks | |
| Resistance to fire under tension and shear loading | | C124 to C127 (Applies only to the conditions of dry masonry) | |
| Installation | Pre-positioned installation | Anchor rod or internal threaded anchor (in solid brick masonry and autoclaved aerated concrete) | Perforated sleeve with anchor rod or internal threaded anchor (in perforated and solid brick masonry)<br>Size: Selkent H 12x50 K<br>Selkent H 12x85 K<br>Selkent H 16x85 K<br>Selkent H 16x130 K<br>Selkent H 20x85 K<br>Selkent H 20x130 K<br>Selkent H 20x200 K |
| | Push through installation | Anchor rod;<br>use only in cylindrical drill hole (in solid brick masonry and autoclaved aerated concrete) | Perforated sleeve with anchor rod (in perforated and solid brick masonry)<br>Size:<br>Selkent H 18x130/200 K<br>Selkent H 22x130/200 K |
| Installation and use conditions | conditions d/d (dry/dry) | all bricks | |
| | conditions w/d (wet/dry) | | |
| | conditions w/w (wet/wet) | | |
| Installation direction | | D3 (downward and horizontal installation) | |
| Installation temperature | | $T_{i,min}$ = -5 °C to $T_{i,max}$ = +40 °C | |
| In-service temperature | Temperature range Tb | -40 °C to +80 °C | (max. short term temperature +80 °C<br>max. long term temperature +50 °C) |
| | Temperature range Tc | -40 °C to +120 °C | (max. short term temperature +120 °C;<br>max. long term temperature +72 °C) |

| Injection system Selkent SEL-V+ for masonry | **Annex B1** |
|---|---|
| **Intended Use**<br>Specifications part 1 | |

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## Specifications of intended use part 2

**Anchorages subject to:**

- Static and quasi-static loads
- Exposure to fire

**Base materials:**

- Solid brick masonry (base material group b) and autoclaved aerated concrete (base material group d), acc. to Annex B13 / B14.
- Hollow brick masonry (base material group c), according to Annex B13 / B14.
- For minimum thickness of masonry member is $h_{ef}$+30mm.
- Mortar strength class of the masonry M2,5 at minimum according to EN 998-2:2016.
- For other bricks in solid masonry, hollow or perforated masonry and autoclaved aerated concrete, the characteristic resistance of the anchor may be determined by job site tests (not for bricks under fire exposure) according to EOTA Technical Report TR 053:2022-07 under consideration of the β-factor according to Annex C123, Table C123.1.

  Note (only applies to solid bricks and autoclaved aerated concrete):
  The characteristic resistance is also valid for larger brick sizes, higher compressive strength and higher raw density of the masonry unit.

**Temperature Range:**

- **Tb:** From - 40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°C)
- **Tc:** From -40°C to +120°C (max. short term temperature +120°C and max. long term temperature +72°C)

**Use conditions (Environmental conditions):**

- Structures subject to dry internal conditions (zinc plated steel, stainless steel or high corrosion resistant steel)
- For all other conditions according to EN 1993-1-4:2006+A1:2015 corresponding to corrosion resistance classes to Annex A5, Table A5.1.

| Injection system Selkent SEL-V+ for masonry | **Annex B2** |
|---|---|
| **Intended Use**<br>Specifications part 2 | |

## Specifications of intended use part 3 continued

**Design:**

- The anchorages have to be designed in accordance with EOTA Technical Report TR 054:2023-12 (included the dimensioning for fire exposure), Design method A under the responsibility of a designer experienced in anchorages and masonry work.

  Applies to all bricks, if no other values are specified:

  $N_{Rk} = N_{Rk,b} = N_{Rk,p} = N_{Rk,b,c} = N_{Rk,p,c}$

  $V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$

  For the calculation of pulling out a brick under tension loading $\mathbf{N_{Rk,pb}}$ or pushing out a brick under shear loading $\mathbf{V_{Rk,pb}}$ see EOTA Technical Report TR 054:2023-12.

  $\mathbf{N_{Rk,s}}$, $\mathbf{V_{Rk,s}}$ and $\mathbf{M^0_{Rk,s}}$ see annexes C1-C3.

  Factors for job site tests and displacements see annex C123.

- Verifiable calculation notes and drawings have to be prepared taking into account the relevant masonry in the region of the anchorage, the loads to be transmitted and their transmission to the supports of the structure. The position of the anchor is to be indicated on the design drawings.

**Installation:**

- Conditions d/d: - Installation and use in dry structures.
- Conditions w/w:- Installation and use in dry and wet structures.
- Conditions w/d: - Installation in wet structures and use in dry structures.
- Hole drilling see Annex C (drilling method).
- In case of aborted hole: The hole shall be filled with injection mortar Selkent SEL-V+.
- Bridging of unbearing layer (e.g., plaster) is permitted for masonry with solid bricks and cylindrical drill hole. At perforated brick masonry see Annex B6, Table B6.1.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Fastening screws or anchor rods (including nut and washer) must comply with the appropriate material and property class of the Selkent internal threaded anchor E mentioned in Annex A5, Table A5.1.
- Minimum curing time see Annex B8, Table B8.2.
- Commercial standard threaded rods, washers and hexagon nuts may also be used if the following requirements are fulfilled:

  Material dimensions and mechanical properties of the metal parts according to the specifications are given in Annex A5, Table A5.1

  Conformation of material and mechanical properties of the metal parts by inspection certificate 3.1 according to EN 10204:2004, the documents shall be stored.

  Marking of the anchor rod with the envisage embedment depth. This may be done by the manufacturer of the rod or by a person on job site.

| Injection system Selkent SEL-V+ for masonry | **Annex B3** |
|---|---|
| **Intended Use**<br>Specifications part 3 continued | |

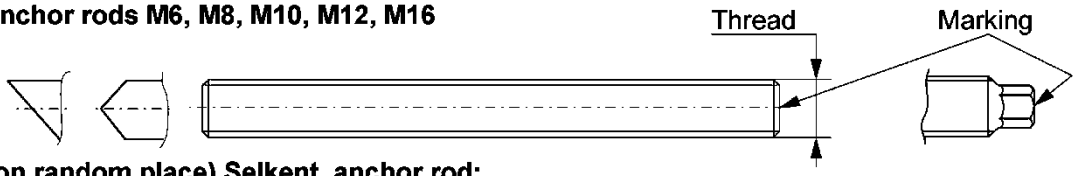
Deutsches Institut für Bautechnik DIBt

**Table B4.1:** Installation parameters for anchor rods in solid bricks and autoclaved aerated concrete without perforated sleeves

| **Anchor rod** | **Thread** | **M6** | **M8** | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|---|
| Nominal drill hole diameter | $d_0$ [mm] | 8 | 10 | 12 | 14 | 18 |
| Effective anchorage depth $h_{ef}$ [1] in AAC cylindrical drill hole | $h_{0,min} \geq h_{ef,min}$ [mm] | 100 | | | | |
| | $h_{0,max} \geq h_{ef,max}$ [mm] | h-30, ≤200 | | | | |
| Effective anchorage depth $h_{ef}$ in AAC conical drill hole | $h_o$ [mm] | - | $h_{ef}$ + 5 | | | - |
| | $h_{ef,1}$ [mm] | | 75 | | | |
| | $h_{ef,2}$ [mm] | | 95 | | | |
| Effective anchorage depth $h_{ef}$ [1] in solid brick (depth of drill hole $h_0 \geq h_{ef}$) | $h_{ef,min}$ [mm] | 50 | | | | |
| | $h_{ef,max}$ [mm] | h-30, ≤200 | | | | |
| Diameter of clearance hole in the fixture | pre-positioning $d_f \leq$ [mm] | 7 | 9 | 12 | 14 | 18 |
| | push through $d_f \leq$ [mm] | 9 | 11 | 14 | 16 | 20 |
| Diameter of cleaning brush | $d_b \geq$ [mm] | see Table B8.1 | | | | |
| Maximum installation torque | $T_{inst}$ [Nm] | see parameters of brick | | | | |

[1] $h_{ef,min} \leq h_{ef} \leq h_{ef,max}$ is possible.

**Selkent anchor rods M6, M8, M10, M12, M16**




**Marking (on random place) Selkent anchor rod:**

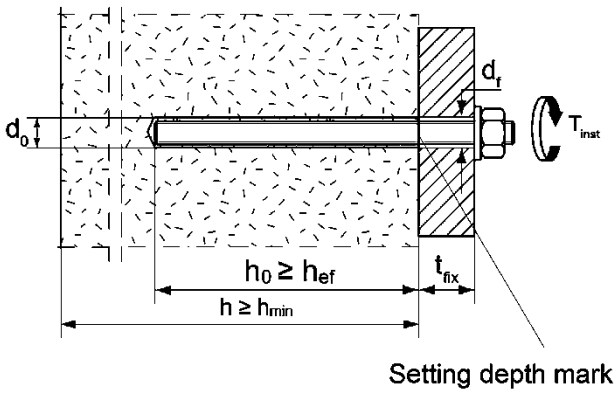
| | | | |
|---|---|---|---|
| Steel zinc plated PC[1] 8.8 | • or + | Steel hot-dip galvanised PC[1] 8.8 | • |
| High corrosion resistant steel HCR PC[1] 50 | • | High corrosion resistant steel HCR PC[1] 70 | – |
| High corrosion resistant steel HCR PC[1] 80 | ( | Stainless steel R property class 50 | ~ |
| Stainless steel R property class 80 | * | | |

Alternatively: Colour coding according to DIN 976-1: 2016; property class 4.6 marking according to EN ISO 898-1:2013

[1] PC = property class

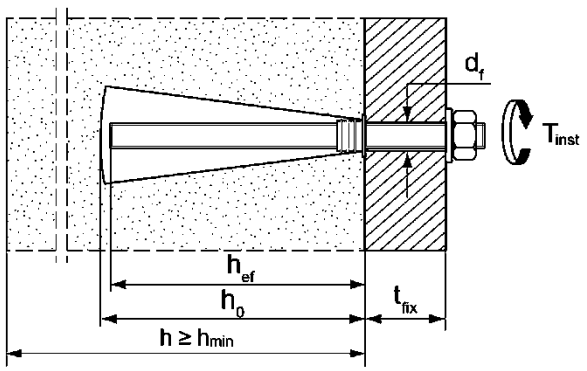
**Installation conditions:**

Anchor rod in cylindrical drill hole




Setting depth mark

Anchor rod in conical drill hole




Figures not to scale

Injection system Selkent SEL-V+ for masonry

**Intended Use**
Installation parameters for anchor rods without perforated sleeve

**Annex B4**

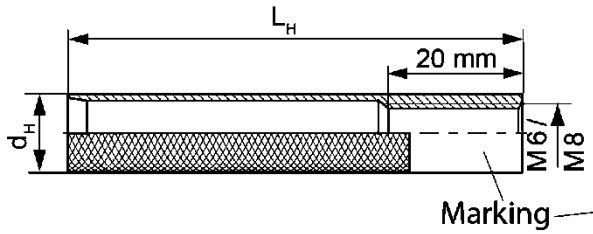
Deutsches Institut für Bautechnik DIBt

**Table B5.1:** Installation parameters for Selkent internal threaded anchors E in solid bricks and autoclaved aerated concrete without perforated sleeves

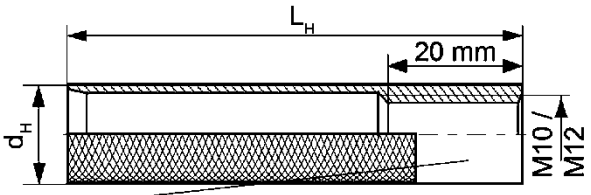
| **Selkent internal threaded anchor E** | | **11x85 M6** | **11x85 M8** | **15x85 M10** | **15x85 M12** |
|---|---|---|---|---|---|
| Diameter of anchor | $d_H$ [mm] | 11 | | 15 | |
| Nominal drill hole diameter | $d_0$ [mm] | 14 | | 18 | |
| Length of anchor | $L_H$ [mm] | 85 | | | |
| Effective anchorage depth | $h_0 \geq h_{ef}$ [mm] | 85 | | | |
| Effective anchorage depth $h_{ef}$ in AAC (conical drill hole) | $h_0$ [mm] | 100 | | - | |
| | $h_{ef}$ [mm] | 85 | | | |
| Diameter of cleaning brush | $d_b \geq$ [mm] | see Table B8.1 | | | |
| Maximum installation torque | $T_{inst}$ [Nm] | see parameters of brick | | | |
| Diameter of clearance hole in the fixture | $d_f$ [mm] | 7 | 9 | 12 | 14 |
| Screw-in depth | $l_{E,min}$ [mm] | 6 | 8 | 10 | 12 |
| | $l_{E,max}$ [mm] | 60 | | | |

**Selkent internal threaded anchor E**

Selkent E 11x85 M6, Selkent E 11x85 M8




Selkent E 15x85 M10, Selkent E 15x85 M12

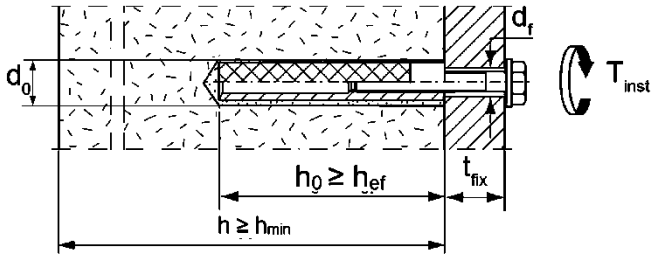



**Marking:**

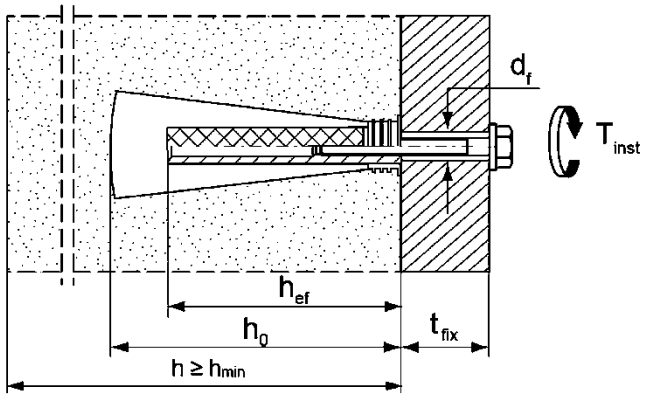
Size, e.g. **M8**, Stainless steel: R, e.g. **M8 R**, High corrosion resistant steel: HCR, e.g. **M8 HCR**

**Installation conditions:**

Internal threaded anchor in cylindrical drill hole




Internal threaded anchor in conical drill hole




Figures not to scale

Injection system Selkent SEL-V+ for masonry

**Intended Use**
Installation parameters for Selkent internal threaded anchor E without perforated sleeve

**Annex B5**

Deutsches Institut für Bautechnik DIBt

**Table B6.1:** Installation parameters for anchor rods and Selkent internal threaded anchors E with perforated sleeves (pre-positioned installation)

| **Selkent perforated sleeve H K** | | **12x50** | **12x85[2)]** | **16x85** | **16x130[2)]** | **20x85** | **20x130[2)]** | **20x200[2)]** |
|---|---|---|---|---|---|---|---|---|
| Nominal drill hole diameter $d_0 = D_{sleeve,nom}$ | $d_0$ [mm] | 12 | | 16 | | 20 | | |
| Depth of drill hole | $h_0$ [mm] | 55 | 90 | 90 | 135 | 90 | 135 | 205 |
| Effective anchorage depth | $h_{ef,min}$ [mm] | 50 | 65 | 85 | 110 | 85 | 110 | 180 |
| | $h_{ef,max}$ [mm] | 50 | 85 | 85 | 130 | 85 | 130 | 200 |
| Size of threaded rod | [-] | M6 and M8 | | M8 and M10 | | M12 and M16 | | |
| Size of Selkent internal threaded anchor E | | - | - | 11x85 | - | 15x85 | - | - |
| Diameter of cleaning brush[1)] | $d_b \geq$ [mm] | see Table B8.1 | | | | | | |
| Maximum installation torque | $T_{inst}$ [Nm] | see parameters of brick | | | | | | |

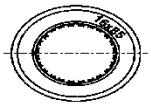
[1)] Only for solid areas in hollow bricks and solid bricks.

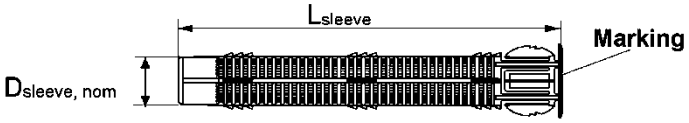
[2)] Bridging of unbearing layer (e.g. plaster) is possible. When reducing the effective anchorage depth $h_{ef,min}$, the values of the next shorter perforated sleeve of the same diameter must be used. The smaller value of charastereristic resistance must be taken.

**Perforated sleeve**

Selkent H 12x50 K; Selkent H 12x85 K; Selkent H 16x85 K; Selkent H 16x130 K;
Selkent H 20x85 K; Selkent H 20x130 K; Selkent H 20x200 K

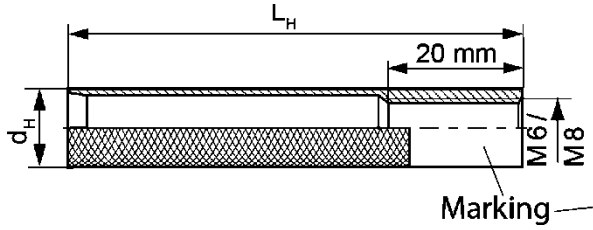
**Marking:**
Size $D_{sleeve,nom}$ x $L_{sleeve}$
(e.g.: 16x85)



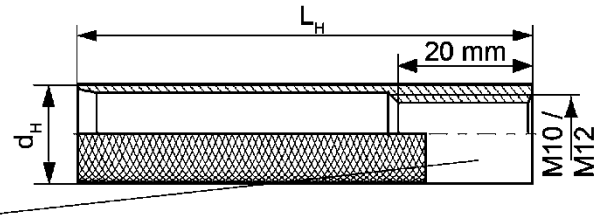



**Selkent internal threaded anchor E**

Selkent E 11x85 M6, Selkent E 11x85 M8

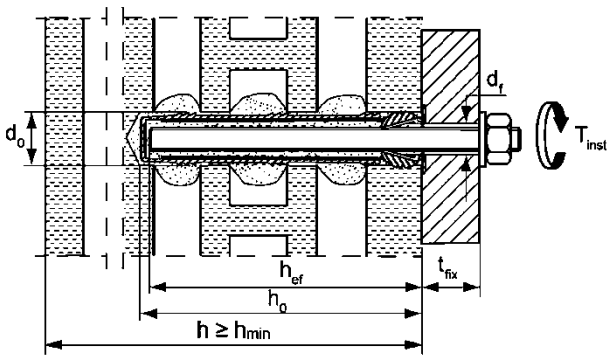



Selkent E 15x85 M10, Selkent E 15x85 M12

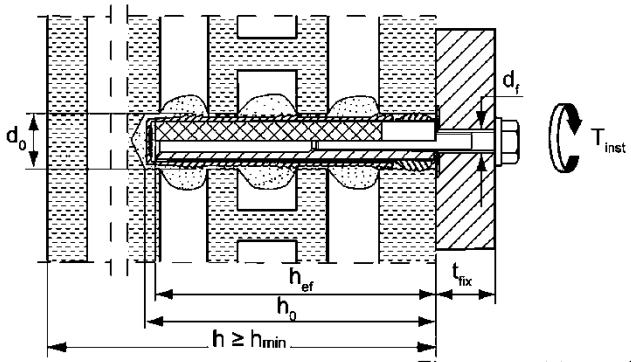



**Installation conditions:**

Anchor rod with perforated sleeve




Internal threaded anchor with perforated sleeve




Figures not to scale

Injection system Selkent SEL-V+ for masonry

**Intended Use**
Installation parameters for anchor rods and Selkent internal threaded anchor E with perforated sleeve (pre-positioned installation)

**Annex B6**

Deutsches Institut für Bautechnik DIBt

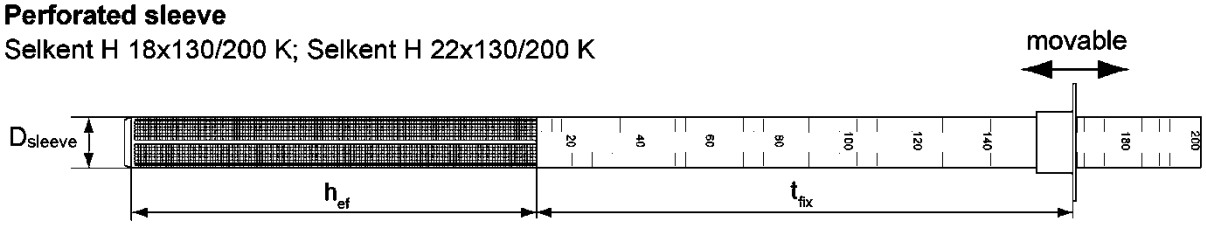
**Table B7.1:** Installation parameters for anchor rods with perforated sleeves (push through installation)

| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
|---|---|---|---|---|
| Nominal sleeve diameter | $D_{sleeve,nom}$ [mm] | 16 | | 20 |
| Nominal drill hole diameter | $d_0$ [mm] | 18 | | 22 |
| Depth of drill hole | $h_0$ [mm] | 135 | | |
| Effective anchorage depth | $h_{ef}$ [mm] | ≥130 | | |
| Diameter of cleaning brush [1)] | $d_b \geq$ [mm] | see Table B8.1 | | |
| Size of threaded rod | [-] | M10 | M12 | M16 |
| Maximum installation torque | $T_{inst}$ [Nm] | see parameters of brick | | |
| Thickness of fixture | $t_{fix,max}$ [mm] | 200 | | |

[1)] Only for solid areas in hollow bricks and solid bricks.

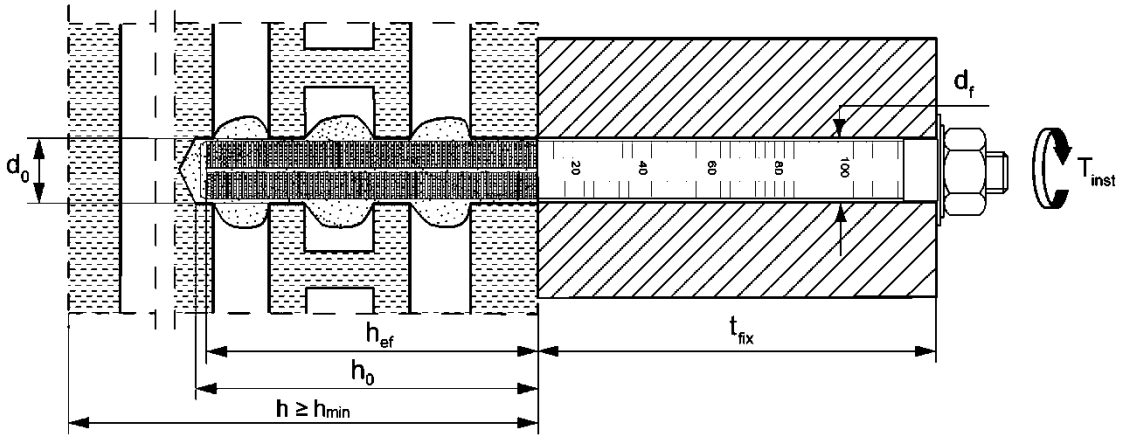
**Perforated sleeve**

Selkent H 18x130/200 K; Selkent H 22x130/200 K




**Installation conditions:**

Anchor rod with perforated sleeve




Figures not to scale

Injection system Selkent SEL-V+ for masonry

**Intended Use**
Installation parameters for anchor rods with perforated sleeves (push through installation)

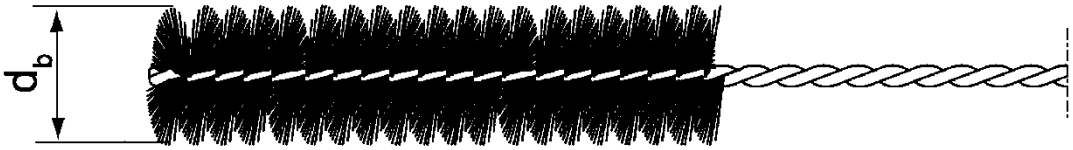
**Annex B7**

Deutsches Institut für Bautechnik DIBt

**Table B8.1:** Parameters of the cleaning brush BS (steel brush with steel bristles)

The size of the cleaning brush refers to the drill hole diameter

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Drill hole diameter | $d_0$ [mm] | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 |
| Brush diameter | $d_b$ [mm] | 9 | 11 | 14 | 16 | 20 | 20 | 25 | 25 |




Only for solid bricks and autoclaved aerated concrete or solid areas of perforated bricks and hollow blocks

**Table B8.2:** Maximum processing times and minimum curing times (During the curing time of the mortar the masonry temperature may not fall below the listed minimum temperature)

| Temperature at anchoring base [°C] | Maximum processing time [2] $t_{work}$ | Minimum curing time [1], [2] $t_{cure}$ |
|---|---|---|
| | Selkent SEL-V+ | Selkent SEL-V+ |
| > -5 to 0 | > 13 min | 24 h |
| > 0 to 5 | 13 min | 3 h |
| > 5 to 10 | 9 min | 90 min |
| > 10 to 20 | 5 min | 60 min |
| > 20 to 30 | 4 min | 45 min |
| > 30 to 40 | 2 min | 35 min |

[1] For wet bricks the curing time must be doubled.

[2] Minimum cartridge temperature +5°C.

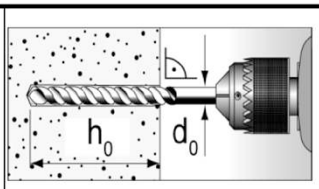
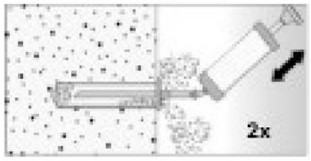
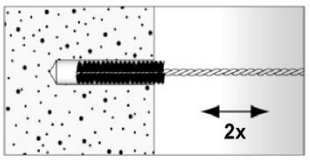
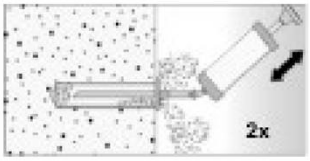
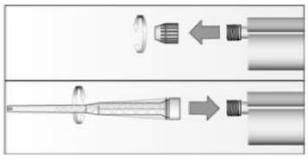
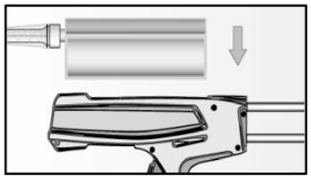
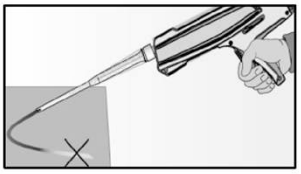
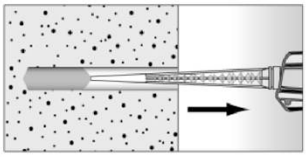
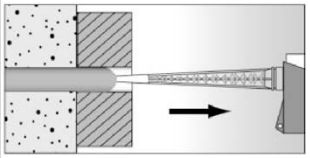
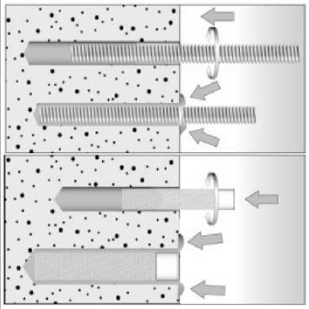
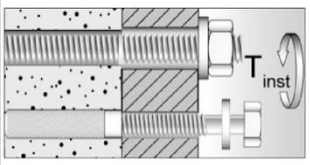
Figures not to scale

| | |
|---|---|
| Injection system Selkent SEL-V+ for masonry | **Annex B8** |
| **Intended Use**<br>Cleaning brush (steel brush)<br>Maximum processing times and minimum curing times | |

Deutsches Institut für Bautechnik DIBt

## Installation instruction part 1

Installation in solid brick and autoclaved aerated concrete (without perforated sleeve)

| | | | | |
|---|---|---|---|---|
| 1 |  | Drill the hole (drilling method see Annex C of the respective brick) depth of drill hole $\mathbf{h_0}$ and drill hole diameter $\mathbf{d_0}$ see **Table B4.1; B5.1**. | | |
| 2 |  |  |  | Blow out the drill hole twice. Brush twice and blow out twice again. |
| 3 |  | Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible). | | |
| 4 |  | Place the cartridge into a suitable dispenser. |  | Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of. |
| 5 |  | Fill approximetly 2/3 of the drill hole with mortar beginning from the bottom of the hole[1)]. Avoid bubbles! |  | For push through installation fill the annular clearance with mortar. |
| 6 |  | Only use clean and oil-free metal parts.<br>Mark the anchor rod for setting depth.<br>Insert the anchor rod or Selkent internal threaded anchor E by hand using light turning motions.<br>When reaching the setting depth marking, excess mortar must emerge from the mouth of the drill hole. | | |
| 7 |  | Do not touch.<br>Minimum curing time see **Table B8.2**. |  | Mounting the fixture.<br>max $T_{inst}$ see parameter of brick in **Annex C**. |

[1)] Exact volume of mortar see manufacturer´s specification.

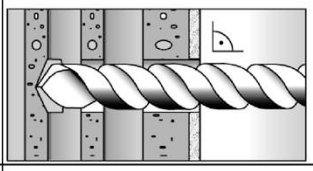
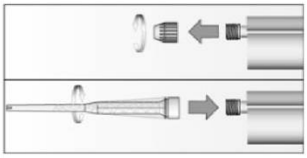
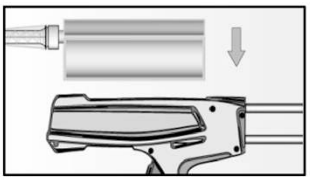
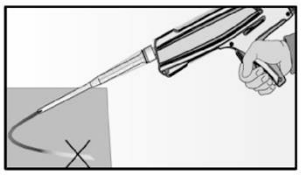
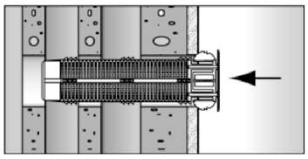
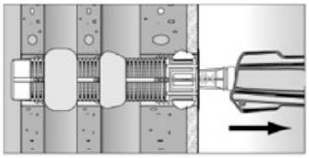
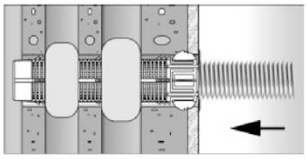
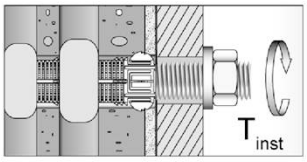
Injection system Selkent SEL-V+ for masonry

**Intended Use**
Installation instruction (without perforated sleeve) part 1

**Annex B9**

## Installation instruction part 2

Installation in perforated or solid brick with perforated sleeve (pre-positioned installation)

| | | | | |
|---|---|---|---|---|
| 1 |  | Drill the hole (drilling method see Annex C of the respective brick). depth of drill hole $h_0$ and drill hole diameter $d_0$ see **Table B6.1** | When install perforated sleeves in solid bricks or solid areas of hollow bricks, also clean the hole by blowing out and brushing. | |
| 2 |  | Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible). | | |
| 3 |  | Place the cartridge into a suitable dispenser. |  | Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of. |
| 4 |  | Insert the perforated sleeve flush with the surface of the masonry or plaster. |  | Fill the perforated sleeve completely with mortar beginning from the bottom of the hole[1)]. |
| 5 |  | Only use clean and oil-free metal parts. Mark the ancher rod for setting depth. Insert the anchor rod or the Selkent internal threaded anchor E by hand using light turning motions until reaching the setting depth marking (anchor rod) or flush with the surface (internal threaded anchor). | | |
| 6 |  | Do not touch. Minimum curing time see **Table B8.2** |  | Mounting the fixture. max $T_{inst}$ see parameter of brick in **Annex C**. |

[1)] Exact volume of mortar see manufacturer´s specification.

Injection system Selkent SEL-V+ for masonry

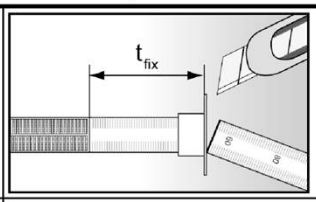
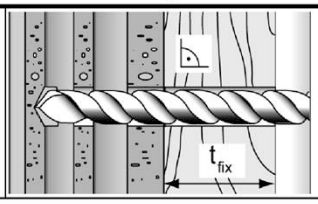
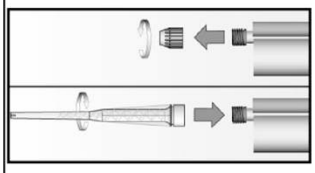
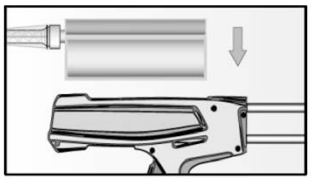
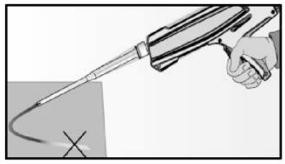
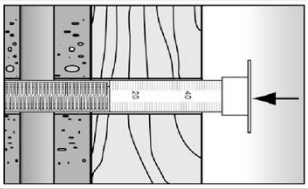
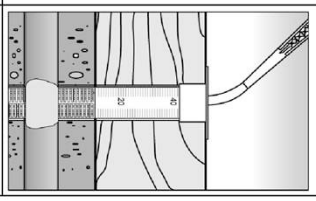
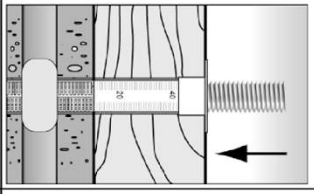
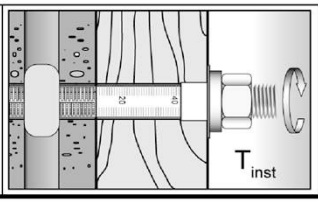
**Intended Use**
Installation instruction (with perforated sleeve) part 2

**Annex B10**

Deutsches Institut für Bautechnik DIBt

## Installation instruction part 3

Installation in perforated or solid brick with perforated sleeve (push through installation)

| | | | | |
|---|---|---|---|---|
| 1 |  | Push the movable stop up to the correct thickness of fixture and cut the overlap. |  | Drill the hole through the fixture. Depth of drill hole **($h_0$ + $t_{fix}$)** and drill hole diameter see **Table B7.1**. |
| 2 |  | Remove the sealing cap. Screw on the static mixer. (the spiral in the static mixer must be clearly visible). | | |
| 3 |  | Place the cartridge into a suitable dispenser. |  | Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of. |
| 4 |  | Insert the perforated sleeve flush with the surface of the fixture into the drill hole. |  | Fill the sleeve with mortar beginning from the bottom of the hole.[1] For deep drill holes use an extension tube. |
| 5 |  | Only use clean and oil-free metal parts. Mark the anchor rod for setting depth. Insert the anchor rod or the Selkent internal threaded anchor E by hand using light turning motions until reaching the setting depth marking (anchor rod) or flush with the surface (internal threaded anchor). | | |
| 6 |  | Do not touch. Minimum curing time see **Table B8.2**. |  | Mounting the fixture. max $T_{inst}$ see parameter of brick in **Annex C**. |

[1] Exact volume of mortar see manufacturer´s specification.

Injection system Selkent SEL-V+ for masonry

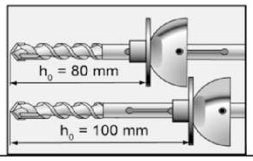
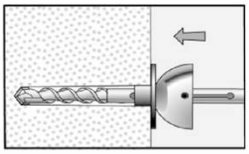
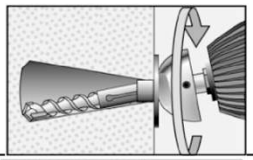
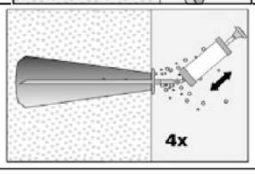
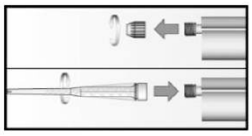
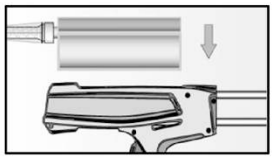
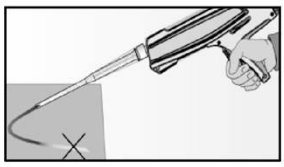
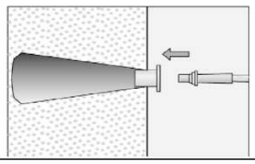
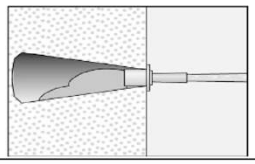
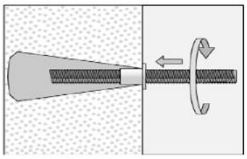
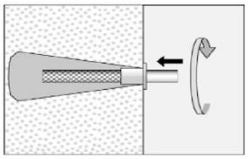
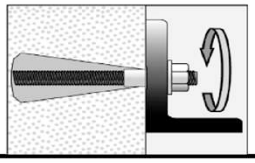
**Intended Use**
Installation instruction (with perforated sleeve) part 3

**Annex B11**

Deutsches Institut für Bautechnik DIBt

## Installation instruction part 4

Installation in autoclaved aerated concrete with special conic drill bit PBB (pre-positioned installation)

| | | | | |
|---|---|---|---|---|
| 1 |  | Position the movable drill bit arrester on the used drill hole depth (see **Table B4.1**).<br>For this, unlock the clamp screw and slide the arrester.<br>Now fix the clamp screw. | | |
| 2 |  | Drill the cylindrical hole with rotating drill until the arrester contact the material surface (drilling method see Annex C of the respective brick). | | |
| 3 |  | Deviate the working power drill circulate to generate an conic undercut in the material. | | |
| 4 |  | Blow out the drill hole four times. | | |
| 5 |  | Remove the sealing cap. Screw on the static mixer.<br>(the spiral in the static mixer must be clearly visible). | | |
| 6 |  | Place the cartridge into a suitable dispenser. |  | Press out approximately 10 cm of mortar until the resin is permanently grey in colour. Mortar which is not grey in colour will not cure and must be disposed of. |
| 7 |  | Put the center sleeve into the drill hole and adapt the injection adapter onto the static mixer. |  | Fill the drill hole with injection mortar. |
| 8 |  |  | Only use clean and oil-free metal parts.<br>Mark the anchor rod for setting depth.<br>Insert the anchor rod or Selkent internal threaded anchor E by hand using light turning motions.<br>When reaching the setting depth marking, excess mortar must emerge from the mouth of the drill hole. | |
| 9 |  | Do not touch.<br>Minimum curing time see **Table B8.2**. |  | Mounting the fixture.<br>max $T_{inst}$ see parameter of brick **in Annex C**. |

Injection system Selkent SEL-V+ for masonry

**Intended Use**
Installation instruction for autoclaved aerated concrete with special conic drill bit PBB (pre-positioned installation) part 4

**Annex B12**

Deutsches Institut für Bautechnik DIBt

**Table B13.1:** Overview of assessed bricks part 1

| Kind of masonry | Brick format [mm] | Mean compressive strength [N/mm²] | Main country of origin | Mean gross density ρ [kg/dm³] | Annex |
|---|---|---|---|---|---|
| **Solid brick Mz** | | | | | |
| **Solid brick Mz** | **NF** ≥240x115x71 | 15 / 25 / 35 | Germany | ≥1,8 | C4 – C7 |
| | **2DF** ≥240x115x113 | 12,5 / 20 | Germany | ≥1,8 | C8 / C9 |
| | ≥ 245x118x54 | 12,5 / 25 | Italy | ≥1,8 | C10 / C11 |
| | ≥ 230x108x55 | 12,5 / 25 | Denmark | ≥1,8 | C12 / C13 |
| **Solid calcium silicate (sand- lime) brick KS / perforated calcium silicate (sand- lime) brick KSL** | | | | | |
| **Solid calcium silicate brick KS** | **NF** ≥240x115x71 | 15 / 25 / 35 | Germany | ≥2,0 | C14 / C15 |
| | **8DF** ≥ 250x240x240 | 12,5 / 25 / 35 | Germany | ≥2,0 | C16 / C17 |
| | ≥ 997x214x538 | 12,5 / 25 & 45 | Netherlands | ≥1,8 & ≥2,2 | C18 / C19 |
| | ≥ 240x115x113 | 12,5 / 25 | Germany | ≥1,8 | C20 – C23 |
| **Perforated calcium silicate brick KSL** | **3DF** 240x175x113 | 10 / 12,5 / 15 / 20 / 25 | Germany | ≥1,4 | C24 – C27 |
| **Vertical perforated brick HLz** | | | | | |
| **Vertical perforated brick HLz** | 370x240x237 | 5 / 7,5 / 10 / 12,5 / 15 | Germany | ≥1,0 | C28 / C29 |
| | 500x175x237 | 5 / 7,5 / 10 / 12,5 / 15 | Germany | ≥1,0 | C28 / C29 |
| | **2DF** 240x115x113 | 7,5 / 12,5 / 20 / 25 / 35 | Germany | ≥1,4 | C30 / C31 |
| | 248x365x248 | 5 / 7,5 / 10 | Germany | ≥0,6 | C32 – C35 |
| | 248x365x249 | 10 / 12,5 / 15 | Germany | ≥0,7 | C36 – C39 |
| | 248x365x249 | 5 / 8 | Germany | ≥0,5 | C40 – C43 |
| | 248x425x248 | 5 / 8 / 10 | Germany | ≥0,8 | C44 – C47 |
| | 248x425x248 | 5 / 7,5 / 10 | Germany | ≥0,8 | C48 – C51 |
| | 500x200x315 | 5 / 7,5 / 10 | Germany | ≥0,6 | C52 – C55 |
| | 500x200x300 | 5 / 7,5 / 10 / 12,5 | France | ≥0,7 | C56 – C59 |
| | 500x200x315 | 2,5 / 5 / 7,5 / 10 | France | ≥0,7 | C60 – C63 |
| | 560x200x275 | 5 / 8 / 10 | France | ≥0,7 | C64 / C65 |
| | 255x120x118 | 2,5 / 5 / 8 / 10 / 12,5 / 15 | Italy | ≥1,0 | C66 - C68 |
| | 275x130x94 | 7,5 / 10 / 15 / 20 / 25 | Spain | ≥0,8 | C69 - C71 |
| | 220x190x290 | 7,5 / 10 / 12,5 | Portugal | ≥0,7 | C72 – C75 |
| | 253x300x240 | 2,5 / 5 / 8 | Austria | ≥0,8 | C76 – C79 |
| | 250x440x250 | 8 / 10 / 12,5 | Austria | ≥0,7 | C80 – C83 |
| | 230x108x55 | 2,5 / 5 / 8 / 10 | Denmark | ≥1,4 | C84 - C85 |
| | 365x248x245 | 10 | Austria | ≥0,6 | C86 - C89 |
| | 240x175x113 | 12,5 | Germany | ≥0,9 | C90 - C93 |

Injection system Selkent SEL-V+ for masonry

**Intended Use**
Overview of assessed bricks part 1

**Annex B13**

Deutsches Institut für Bautechnik DIBt

**Table B14.1:** Overview of assessed bricks part 2

| Kind of masonry | Brick format [mm] | Mean compressive strength [N/mm²] | Main country of origin | Mean gross density ρ [kg/dm³] | Annex |
|---|---|---|---|---|---|
| **Horizontal perforated brick LLz** | | | | | |
| **Horizontal perforated brick LLz** | 248x78x250 | 2,5 / 5 / 8 | Italy | ≥0,7 | C94 / C95 |
| | 128x88x275 | 2,5 | Spain | ≥0,8 | C96 / C97 |
| **Light-weight concrete hollow block Hbl** | | | | | |
| **Light-weight concrete hollow block Hbl** | 362x240x240 | 2,5 / 5 | Germany | ≥1,0 | C98 – C101 |
| | 500x200x200 | 2,5 / 5 / 8 | France | ≥1,0 | C102 / C103 |
| | 440x215x215 | 5 / 8 / 10 / 12,5 | Ireland | ≥1,2 | C104 – C107 |
| **Light-weight concrete solid block Vbl** | | | | | |
| **Light-weight concrete solid block Vbl** | ≥ 372x300x254 | 2,5 | Germany | ≥0,6 | C108 / C109 |
| | ≥ 250x240x239 | 5 / 8 / 10 | Germany | ≥1,6 | C110 – C113 |
| | ≥ 440x100x215 | 5 / 8 / 10 / 12,5 | Ireland | ≥2,0 | C114 / C115 |
| | ≥ 440x95x215 | 7,5 / 10 / 12,5 / 15 | England | ≥2,0 | C116 / C117 |
| **Autoclaved aerated concrete (AAC)** | | | | | |
| **PP2 / AAC** | - | 2,5 | Germany | 0,35 | C118 – C122 |
| **PP4 / AAC** | - | 5 | Germany | 0,5 | C118 – C122 |
| **PP6 / AAC** | - | 8 | Germany | 0,65 | C118 – C122 |

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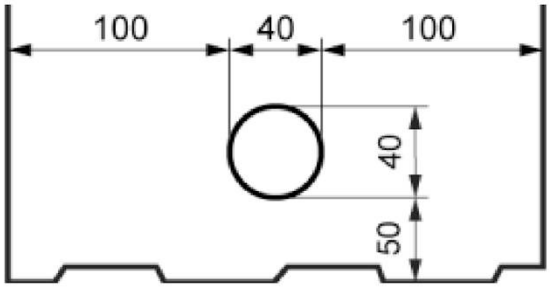
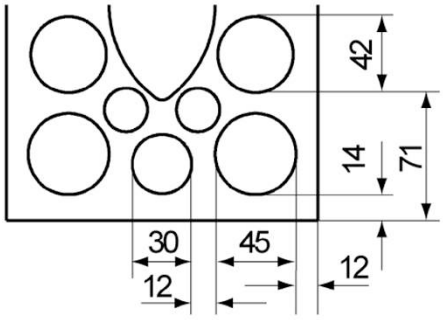
## Table B15.1: Overview dimensions of perforated and hollow bricks part 1

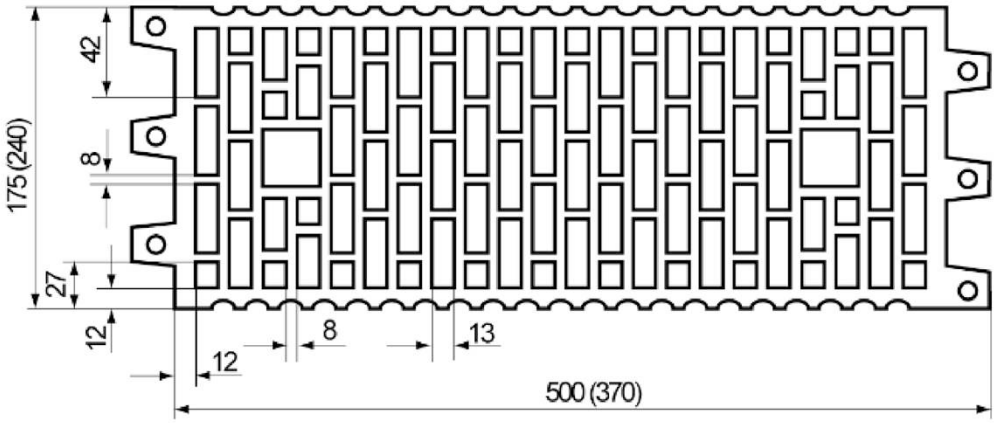
Solid calcium silicate brick KS, 8DF,
EN 771-2:2011+A1:2015 according to Annex C16



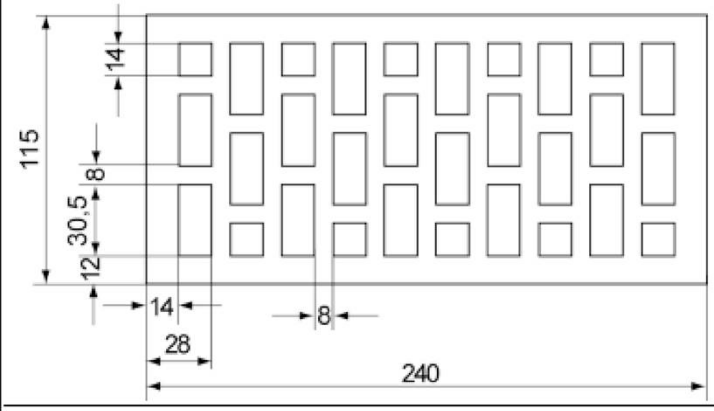

Perforated calcium silicate brick KSL, 3DF,
EN 771-2:2011+A1:2015; e.g. KS Wemding
according to Annex C24



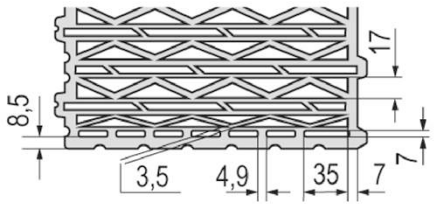

Vertical perforated brick HLz, EN 771-1:2011+A1:2015: e.g. Wienerberger, Poroton according to Annex C28




Vertical perforated brick HLz, 2DF,
EN 771-1:2011+A1:2015; e.g. Wienerberger
according to Annex C30




Vertical perforated brick HLz, U8,
EN 771-1:2011+A1:2015; according to Annex C32




Measures in [mm]
Figures not to scale

| Injection system Selkent SEL-V+ for masonry | **Annex B15** |
|---|---|
| **Intended Use**<br>Overview dimensions of perforated and hollow bricks part 1 | |

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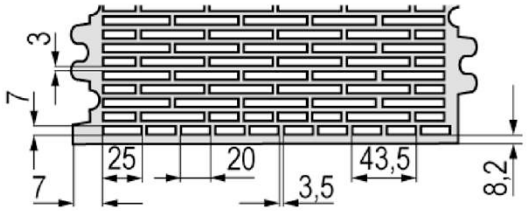
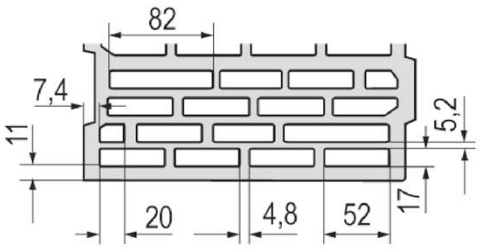
## Table B16.1: Overview dimensions of perforated and hollow bricks part 2

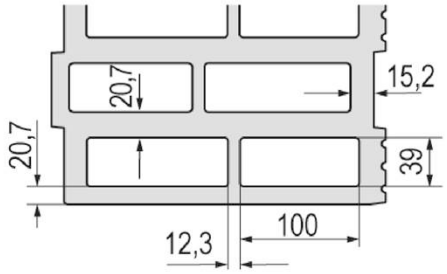
Vertical perforated brick HLz, T10, T11, EN 771-1:2011+A1:2015; according to Annex C36



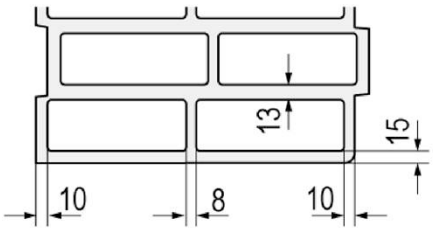

Vertical perforated brick HLz, T7 PF, filled with perlit, EN 771-1:2011+A1:2015; according to Annex C40



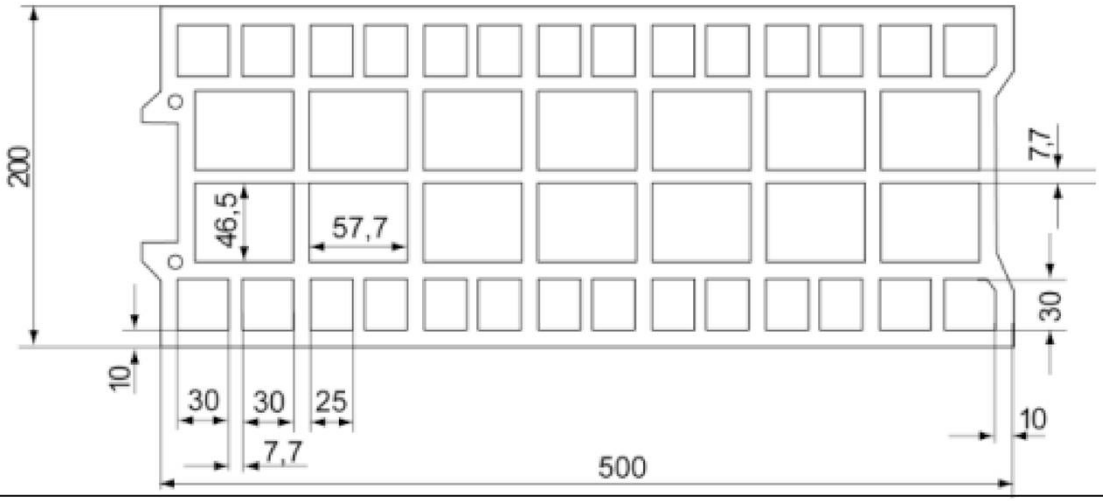

Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1:2011+A1:2015; according to Annex C44




Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1:2015; according to Annex C48




Vertical perforated brick HLz, EN 771-1:2011+A1:2015; e.g. Bouyer Leroux; According to Annex C52




Measures in [mm]
Figures not to scale

Injection system Selkent SEL-V+ for masonry

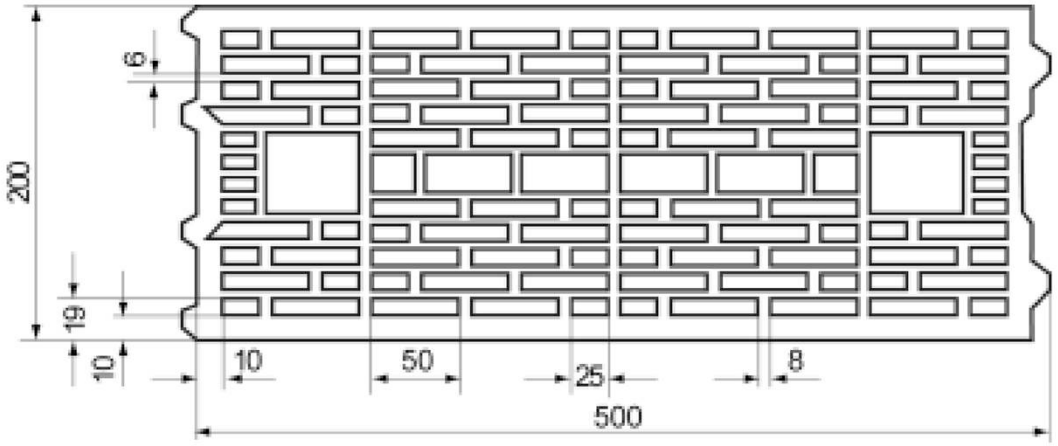
**Intended Use**
Overview dimensions of perforated and hollow bricks part 2

**Annex B16**

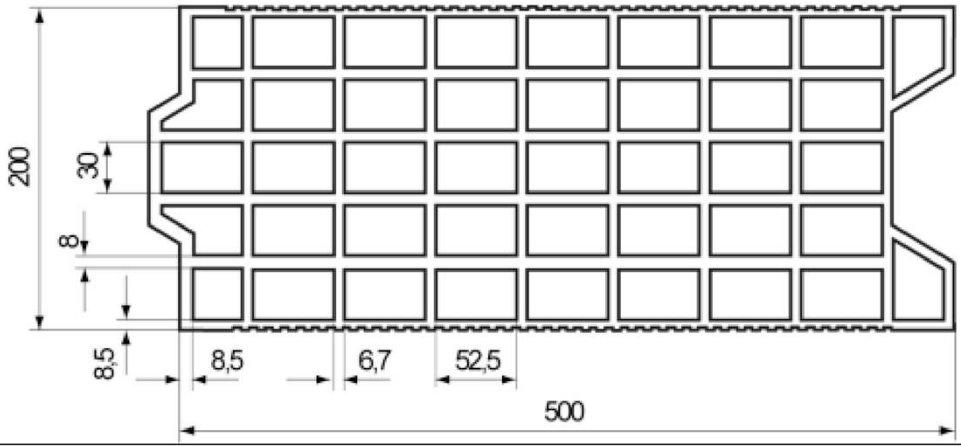
Deutsches Institut für Bautechnik DIBt

**Table B17.1:** Overview dimensions of perforated and hollow bricks part 3

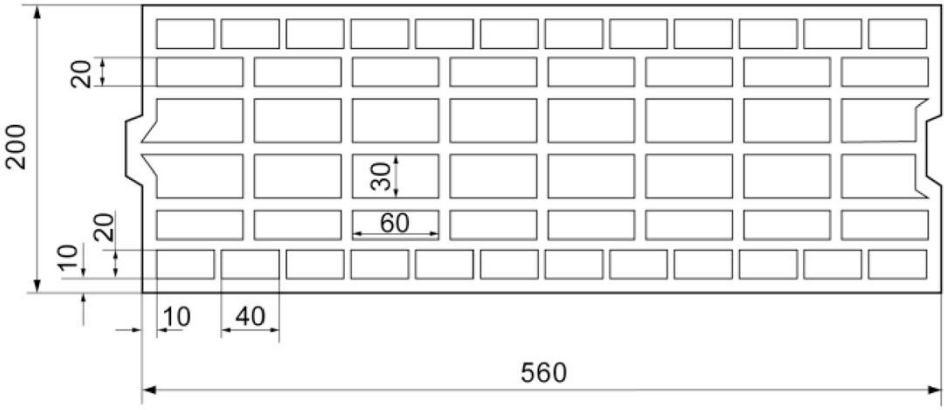
Vertical perforated brick HLz, EN 771-1:2011+A1:2015; e.g. Wienerberger according to Annex C56




Vertical perforated brick HLz, EN 771-1:2011+A1:2015; e.g. Terreal according to Annex C60




Vertical perforated brick HLz, EN 771-1:2011+A1:2015; e.g. Imery according to Annex C64




Measures in [mm]
Figures not to scale

| Injection system Selkent SEL-V+ for masonry | **Annex B17** |
|---|---|
| **Intended Use**<br>Overview dimensions of perforated and hollow bricks part 3 | |

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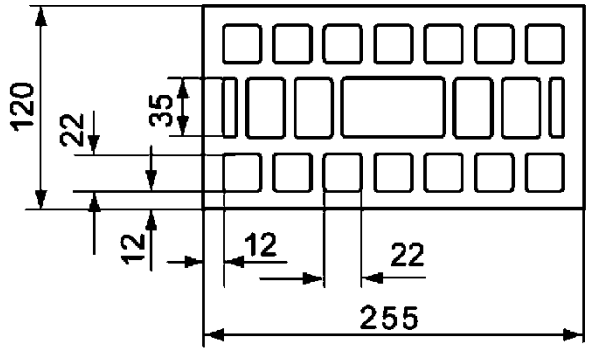
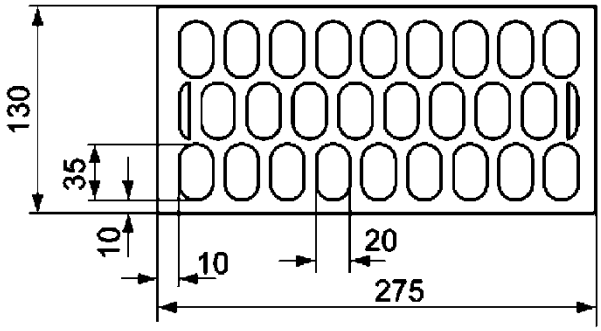
## Table B18.1: Overview dimensions of perforated and hollow bricks part 4

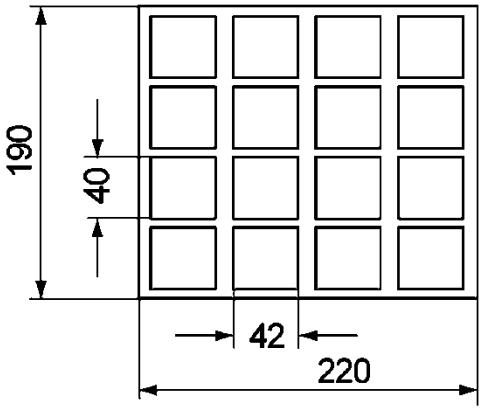
Vertical perforated brick HLz,
EN 771-1:2011+A1:2015;
e.g. Wienerberger according to Annex C66



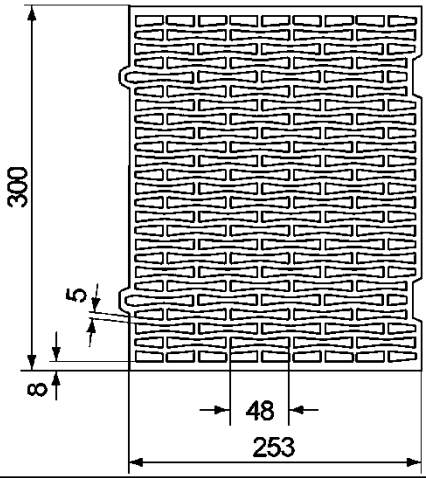

Vertical perforated brick HLz,
EN 771-1:2011+A1:2015;
e.g. Cermanica Farreny S.A. according to Annex C69



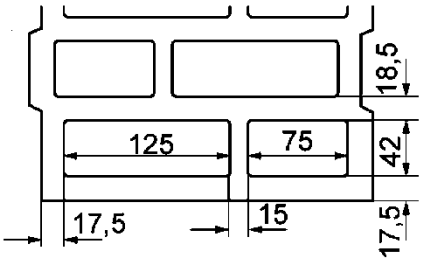

Vertical perforated brick HLz,
EN 771-1:2011+A1:2015;
e.g. Perceram according to Annex C72



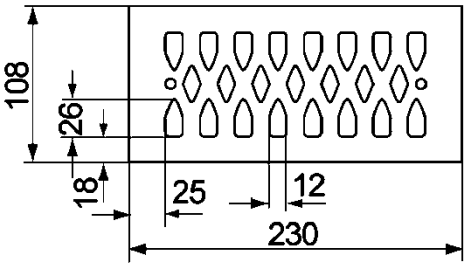

Vertical perforated brick HLz,
EN 771-1:2011+A1:2015;
e.g. Ziegelwerk Brenna according to Annex C76




Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1:2011+A1:2015 according to Annex C80




Vertical perforated brick HLz,
EN 771-1:2011+A1:2015;
e.g. Wienerberger according to Annex C84




Measures in [mm]
Figures not to scale

Injection system Selkent SEL-V+ for masonry

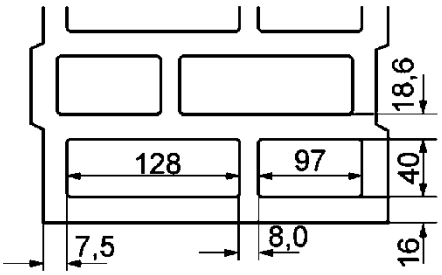
**Intended Use**
Overview dimensions of perforated and hollow bricks part 4

**Annex B18**

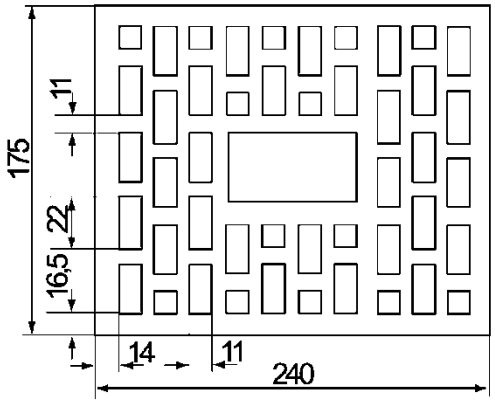
Deutsches Institut für Bautechnik DIBt

## Table B19.1: Overview dimensions of perforated and hollow bricks part 5

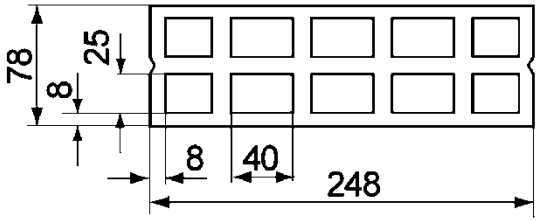
Vertical perforated brick filled with mineral wool,
EN 771-1:2011+A1:2015; according to Annex C86



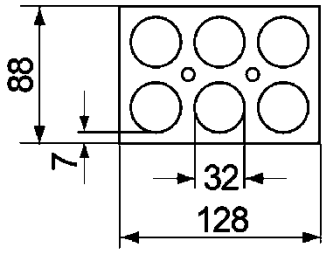

Vertical perforated brick HLz,
EN 771-1:2011+A1:2015;
e.g. Wienerberger according to Annex C90



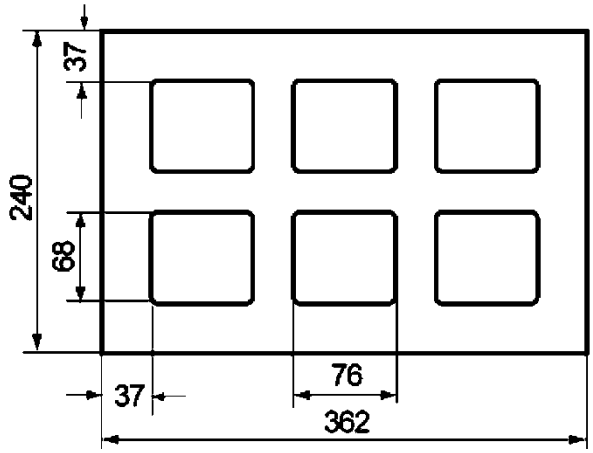

Horizontal perforated brick LLz,
EN 771-1:2011+A1:2015; according to Annex C94



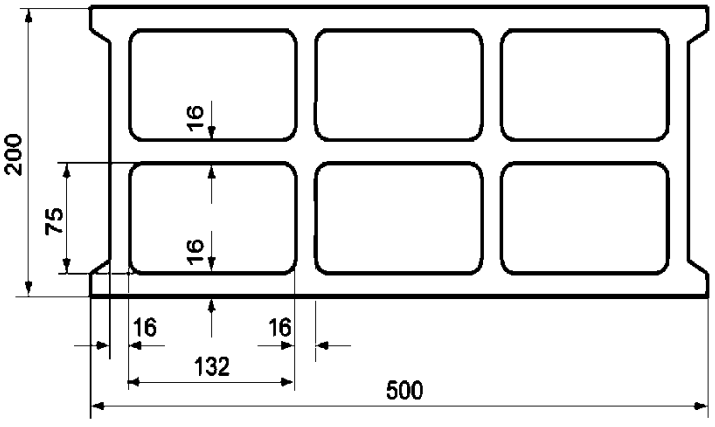

Horizontal perforated brick LLz,
EN 771-1:2011+A1:2015;
e.g. Cermanica Farreny S.A according to Annex C96




Light-weight concrete hollow block Hbl,
EN 771-3:2011+A1:2015; according to Annex C98




Light-weight concrete hollow block Hbl,
EN 771-3:2011+A1:2015;
e.g. Sepa according to Annex C102



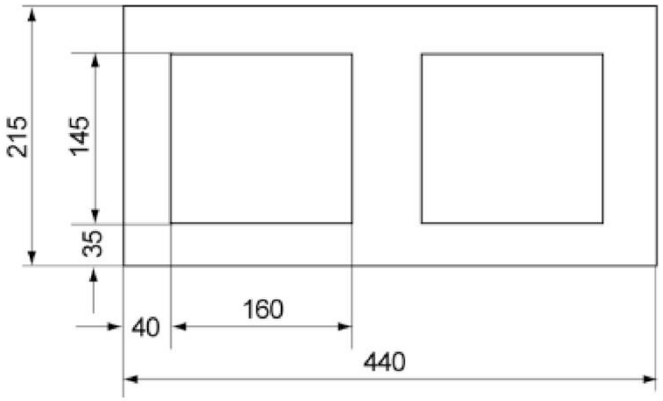

Measures in [mm]
Figures not to scale

| Injection system Selkent SEL-V+ for masonry | |
|---|---|
| **Intended Use**<br>Overview dimensions of perforated and hollow bricks part 5 | **Annex B19** |

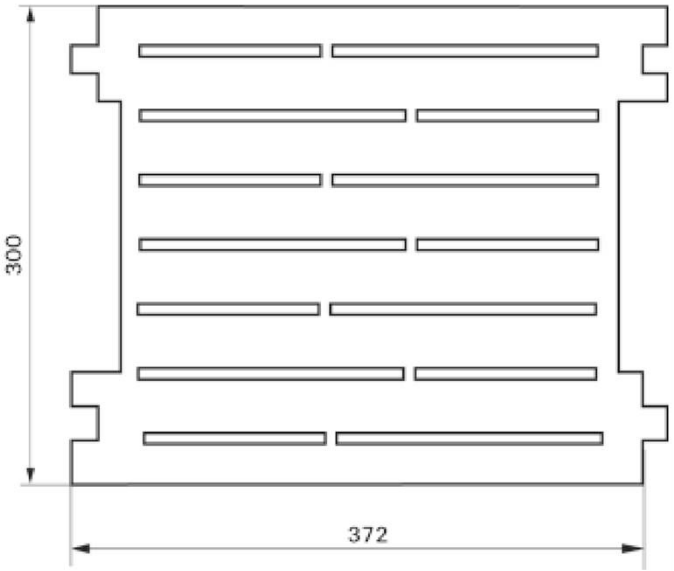
Deutsches Institut für Bautechnik DIBt

## Table B20.1: Overview dimensions of perforated and hollow bricks part 6

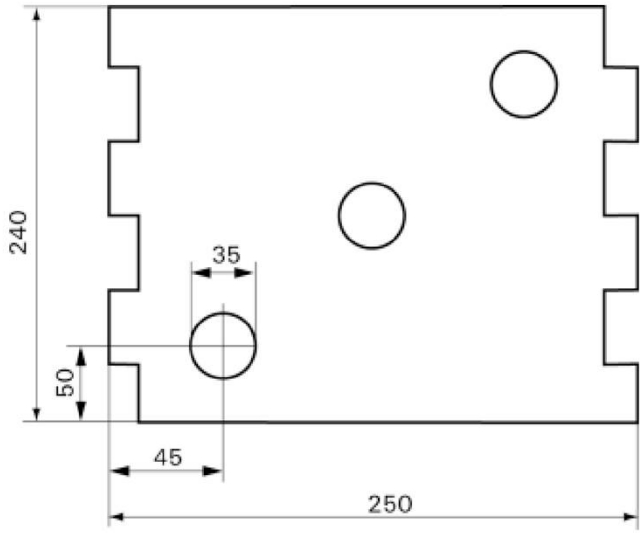
Light-weight concrete hollow block Hbl,
EN 771-3:2011+A1:2015
e.g. Roadstone wood according to Annex C104




Light-weight concrete hollow block Hbl,
EN 771-3:2011+A1:2015
e.g. Sepa according to Annex C108




Light-weight concrete solid block Vbl,
EN 771-3:2011+A1:2015;
e.g. Sepa according to Annex C110




Measures in [mm]
Figures not to scale

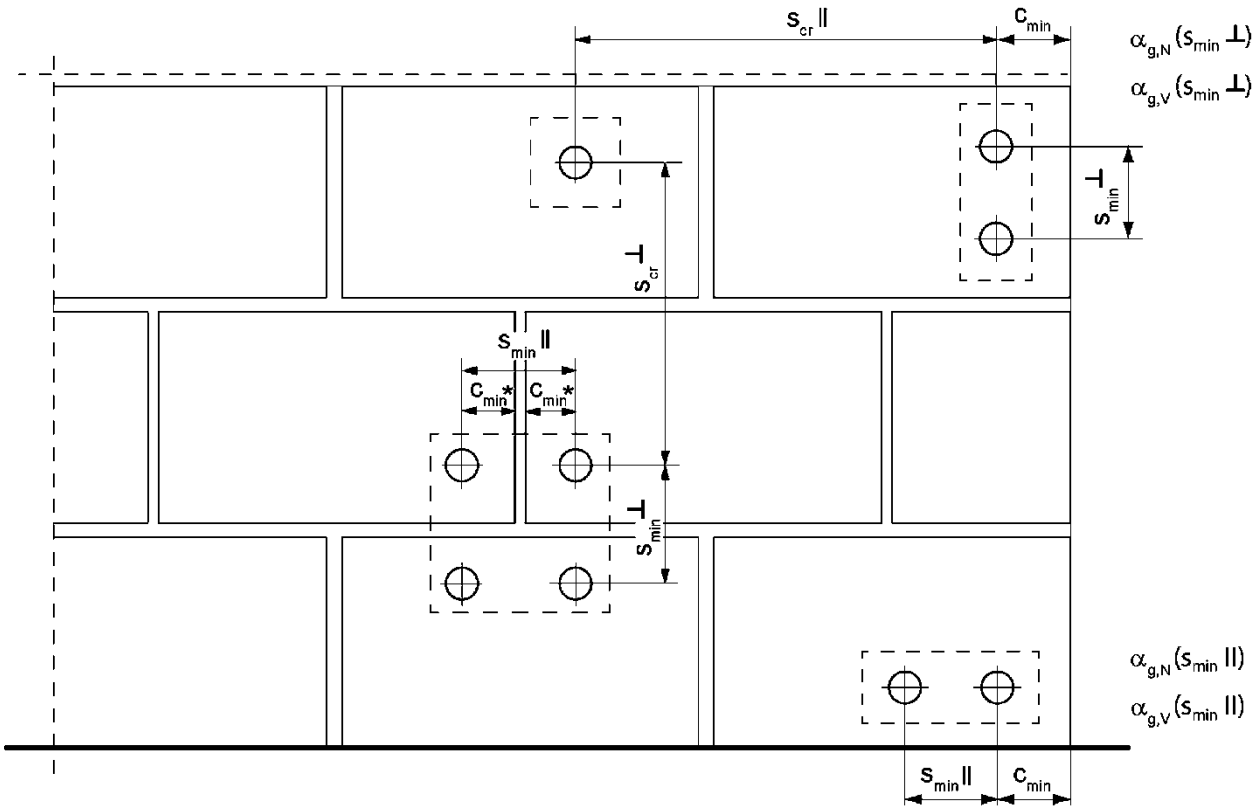
Injection system Selkent SEL-V+ for masonry

**Intended Use**
Overview dimensions of perforated and hollow bricks part 6

**Annex B20**

Deutsches Institut für Bautechnik DIBt

## Spacing and edge distance part 1




* Only, if vertical joints are not completely filled with mortar

| | | |
|---|---|---|
| $s_{min}$ ‖ | = | Minimum spacing parallel to horizontal joint |
| $s_{min}$ ⊥ | = | Minimum spacing perpendicular to horizontal joint |
| $s_{cr}$ ‖ | = | Characteristic spacing parallel to horizontal joint |
| $s_{cr}$ ⊥ | = | Characteristic spacing perpendicular to horizontal joint |
| $c_{cr} = c_{min}$ | = | Edge distance |
| $\alpha_{g,N}$ ($s_{min}$ ‖) | = | Group factor for tension load, anchor group parallel to horizontal joint |
| $\alpha_{g,V}$ ($s_{min}$ ‖) | = | Group factor for shear load, anchor group parallel to horizontal joint |
| $\alpha_{g,N}$ ($s_{min}$ ⊥) | = | Group factor for tension load, anchor group perpendicular to horizontal joint |
| $\alpha_{g,V}$ ($s_{min}$ ⊥) | = | Group factor for shear load, anchor group perpendicular to horizontal joint |

Figures not to scale

| | |
|---|---|
| Injection system Selkent SEL-V+ for masonry | **Annex B21** |
| **Intended Use**<br>Spacing and edge distance part 1 | |

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## Spacing and edge distance part 2

For $s \geq s_{cr}$: $\alpha_g = 2$

For $s_{min} \leq s < s_{cr}$: $\alpha_g$ according to installation parameters of brick Annex C

Group of 2 anchors

$N^g_{Rk} = \alpha_{g,N} \bullet N_{Rk}$; $V^g_{Rk,b} = V^g_{Rk,c,II} = V^g_{Rk,c,\perp} = \alpha_{g,V} \bullet V_{Rk}$

Group of 4 anchors

$N^g_{Rk} = \alpha_{g,N}\ (s_{min}II) \bullet \alpha_{g,N}\ (s_{min}\perp) \bullet N_{Rk}$ ;

$V^g_{Rk,b} = V^g_{Rk,c,II} = V^g_{Rk,c,\perp} = \alpha_{g,V}\ (s_{min}II) \bullet \alpha_{g,V}\ (s_{min}\perp) \bullet V_{Rk}$

with $N_{Rk}$ and $\alpha_{g,N}$ depending on $s_{min}II$ or $s_{min}\perp$ acc. to Annex C

with $V_{Rk}$ and $\alpha_{g,V}$ depending on $s_{min}II$ or $s_{min}\perp$ acc. to Annex C

| Injection system Selkent SEL-V+ for masonry | Annex B22 |
|---|---|
| **Intended Use**<br>Spacing and edge distance part 2 | |

**Table C1.1:** Characteristic resistance to **steel failure** under **tension loading** of **Selkent anchor rods** and **standard threaded rods**

| **Anchor rod / standard threaded rod** | | | | **M6** | **M8**[3] | **M10**[3] | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|
| **Characteristic resistance to steel failure under tension loading** | | | | | | | | |
| Characteristic resistance $N_{Rk,s}$ | Steel zinc plated | Property class | 4.6 | [kN] | 8,0 | 14,6(13,2) | 23,2(21,4) | 33,7 | 62,8 |
| | | | 4.8 | | 8,0 | 14,6(13,2) | 23,2(21,4) | 33,7 | 62,8 |
| | | | 5.8 | | 10,0 | 18,3(16,6) | 29,0(26,8) | 42,1 | 78,5 |
| | | | 8.8 | | 16,0 | 29,2(26,5) | 46,4(42,8) | 67,4 | 125,6 |
| | Stainless steel R and High corrosion resistant steel HCR | | 50 | | 10,0 | 18,3 | 29,0 | 42,1 | 78,5 |
| | | | 70 | | 14,0 | 25,6 | 40,6 | 59,0 | 109,9 |
| | | | 80 | | 16,0 | 29,2 | 46,4 | 67,4 | 125,6 |
| **Partial factors** [1] | | | | | | | | |
| Partial factors $\gamma_{Ms,N}$ | Steel zinc plated | Property class | 4.6 | [-] | 2,00 | | | | |
| | | | 4.8 | | 1,50 | | | | |
| | | | 5.8 | | 1,50 | | | | |
| | | | 8.8 | | 1,50 | | | | |
| | Stainless steel R and High corrosion resistant steel HCR | | 50 | | 2,86 | | | | |
| | | | 70 | | 1,50[2] / 1,87 | | | | |
| | | | 80 | | 1,60 | | | | |

[1] In absence of other national regulations

[2] Only for Selkent Anchor rod made of high corrosion resistant steel HCR

[3] Values in brackets are valid for undersized threaded rods with smaller stress area $A_s$ for hot-dip galvanised standard threaded rods according to EN ISO 10684:2004+AC:2009.

Injection system Selkent SEL-V+ for masonry

**Performance**
Characteristic resistance to steel failure under tension loading of Selkent anchor rods and standard threaded rods

**Annex C1**

Deutsches Institut für Bautechnik DIBt

**Table C2.1:** Characteristic resistance to **steel failure** under **shear loading** of **Selkent anchor rods** and **standard threaded rods**

| **Anchor rod / standard threaded rod** | | | | **M6** | **M8**[3] | **M10**[3] | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|
| **Characteristic resistance to steel failure under shear loading** | | | | | | | | |
| **without lever arm** | | | | | | | | |
| Characteristic resistance $V^0_{Rk,s}$ | Steel zinc plated | Property class | 4.6 | 4,8 | 8,7(7,9) | 13,9(12,8) | 20,2 | 37,6 |
| | | | 4.8 | 4,8 | 8,7(7,9) | 13,9(12,8) | 20,2 | 37,6 |
| | | | 5.8 | 6,0 | 10,9(9,9) | 17,4(16,0) | 25,2 | 47,1 |
| | | | 8.8 | 8,0 | 14,6(13,2) | 23,2(21,4) | 33,7 | 62,8 |
| | Stainless steel R and High corrosion resistant steel HCR | | 50 | 5,0 | 9,1 | 14,5 | 21,0 | 39,2 |
| | | | 70 | 7,0 | 12,8 | 20,3 | 29,5 | 54,9 |
| | | | 80 | 8,0 | 14,6 | 23,2 | 33,7 | 62,8 |
| | | [kN] | | | | | | |
| **with lever arm** | | | | | | | | |
| Characteristic resistance $M^0_{Rk,s}$ | Steel zinc plated | Property class | 4.6 | 6,1 | 14,9(12,9) | 29,9(26,5) | 52,3 | 132,9 |
| | | | 4.8 | 6,1 | 14,9(12,9) | 29,9(26,5) | 52,3 | 132,9 |
| | | | 5.8 | 7,6 | 18,7(16,1) | 37,3(33,2) | 65,4 | 166,2 |
| | | | 8.8 | 12,2 | 29,9(25,9) | 59,8(53,1) | 104,6 | 265,9 |
| | Stainless steel R and High corrosion resistant steel HCR | | 50 | 7,6 | 18,7 | 37,3 | 65,4 | 166,2 |
| | | | 70 | 10,6 | 26,2 | 52,3 | 91,5 | 232,6 |
| | | | 80 | 12,2 | 29,9 | 59,8 | 104,6 | 265,9 |
| | | [Nm] | | | | | | |
| **Partial factors**[1] | | | | | | | | |
| Partial factors $\gamma_{Ms,V}$ | Steel zinc plated | Property class | 4.6 | 1,67 | | | | |
| | | | 4.8 | 1,25 | | | | |
| | | | 5.8 | 1,25 | | | | |
| | | | 8.8 | 1,25 | | | | |
| | Stainless steel R and High corrosion resistant steel HCR | | 50 | 2,38 | | | | |
| | | | 70 | 1,25[2] / 1,56 | | | | |
| | | | 80 | 1,33 | | | | |
| | | [-] | | | | | | |

[1] In absence of other national regulations

[2] Only for Selkent Anchor rod made of high corrosion resistant steel HCR

[3] Values in brackets are valid for undersized threaded rods with smaller stress area $A_s$ for hot-dip galvanised standard threaded rods (M8 resp. M10) according to EN ISO 10684:2004+AC:2009.

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**Table C3.1:** Characteristic resistance to **steel failure** under **tension / shear loading** of **Selkent internal threaded anchors E**

| **Selkent Selkent internal threaded anchor E** | | | | | **M6** | **M8** | **M10** | **M12** |
|---|---|---|---|---|---|---|---|---|
| **Characteristic resistance to steel failure under tension loading, decisive values of Selkent internal threaded anchor E with screw/threaded rod** | | | | | | | | |
| Characteristic resistance | $N_{Rk,s}$ | Property class | 4.6 | [kN] | 8,0 | 14,6 | 23,2 | 33,7 |
| | | Property class | 5.8 | | 10,0 | 18,3 | 29,0 | 42,1 |
| | | Property class 70 | R | | 14,0 | 25,6 | 40,6 | 59,0 |
| | | | HCR | | 14,0 | 25,6 | 40,6 | 59,0 |
| **Partial factors**[1)] | | | | | | | | |
| Partial factors | $\gamma_{Ms,N}$ | Property class | 4.6 | [-] | 2,00 | | | |
| | | Property class | 5.8 | | 1,50 | | | |
| | | Property class 70 | R | | 1,87 | | | |
| | | | HCR | | 1,87 | | | |
| **Characteristic resistance to steel failure under shear loading; decisive values of Selkent internal threaded anchor E with screw/threaded rod** | | | | | | | | |
| **without lever arm** | | | | | | | | |
| Characteristic resistance | $V_{Rk,s}$ | Property class | 4.6 | [kN] | 4,8 | 8,7 | 13,9 | 20,2 |
| | | Property class | 5.8 | | 6,0 | 10,9 | 15,0 | 21,0 |
| | | Property class 70 | R | | 7,0 | 12,8 | 20,3 | 29,5 |
| | | | HCR | | 7,0 | 12,8 | 20,3 | 29,5 |
| **with lever arm** | | | | | | | | |
| Characteristic resistance | $M^0_{Rk,s}$ | Property class | 4.6 | [Nm] | 6,1 | 14,9 | 29,9 | 52,3 |
| | | Property class | 5.8 | | 7,6 | 18,7 | 37,3 | 65,4 |
| | | Property class 70 | R | | 10,6 | 26,2 | 52,3 | 91,5 |
| | | | HCR | | 10,6 | 26,2 | 52,3 | 91,5 |
| **Partial factors**[1)] | | | | | | | | |
| Partial factors | $\gamma_{Ms,V}$ | Property class | 4.6 | [-] | 1,67 | | | |
| | | Property class | 5.8 | | 1,25 | | | |
| | | Property class 70 | R | | 1,56 | | | |
| | | | HCR | | 1,56 | | | |

[1)] In absence of other national regulations

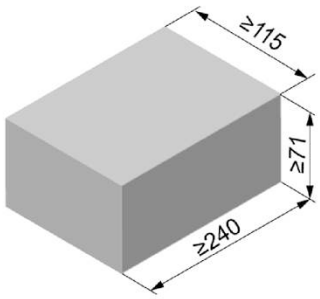
Injection system Selkent SEL-V+ for masonry

**Performance**
Characteristic resistance to steel failure under tension / shear loading of Selkent internal threaded anchors E

**Annex C3**

Deutsches Institut für Bautechnik DIBt

## Solid brick Mz, NF, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 240 | ≥ 115 | ≥ 71 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,8 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 15 / 12 or 25 / 20 or 35 / 28 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |

**Table C4.1:** Installation parameters for edge distance c=100mm

| **Anchor rod** | | | **M6** | **M8** | **M10** | **M12** | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | **11x85** | | **15x85** | |
| **Anchor rod and Selkent internal threaded anchor E without perforated sleeve** | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 50 | 50 | 50 | 50 | 85 | | | |
| | | | 80 | 80 | 80 | 80 | | | | |
| | | | 200 | 200 | 200 | 200 | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 4 | 10 | | | 4 | 10 | | |
| **General installation parameters** | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 100 | | | | 100 | | | |
| Edge distance $h_{ef}$=200 | $c_{min} = c_{cr}$ | | 150 | | | | -[2] | | | |
| Spacing | $s_{min}$ II,N | | 60 | | | | 60 | | | |
| | $h_{ef}$=200 $s_{min}$ II,N | | 240 | | | | -[2] | | | |
| | $s_{min}$ II,V | | 240 | | | | 240 | | | |
| | $s_{cr}$ II | | 240 | | | | 240 | | | |
| | $s_{cr} \perp = s_{min} \perp$ | | 75 | | | | 75 | | | |
| **Drilling method** | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] No performance assessed

**Table C4.2:** Group factors

| **Anchor rods** | | | **M6** | **M8** | **M10** | **M12** | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | **11x85** | | **15x85** | |
| Edge distance | $c_{min}$ | [mm] | **100** | | | | | | | |
| Group factor | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,5 | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | 2,0 | | | | | | | |
| | $h_{ef}$=200 $\alpha_{g,N}$ ($s_{min}$ II) | | 1,5 | | | | | | | |
| | $h_{ef}$=200 $\alpha_{g,V}$ ($s_{min}$ II) | | 2,0 | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | 2,0 | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | 2,0 | | | | | | | |
| | $h_{ef}$=200 $\alpha_{g,N}$ ($s_{min} \perp$) | | 2,0 | | | | | | | |
| | $h_{ef}$=200 $\alpha_{g,V}$ ($s_{min} \perp$) | | 2,0 | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid brick Mz, NF, dimensions, installation parameters for edge distance c=100mm, Group factors

**Annex C4**

Deutsches Institut für Bautechnik DIBt

## Solid brick Mz, NF, EN 771-1:211+A1:2015

**Table C5.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading for edge distance c=100mm

| **Anchor rod** | | **M6** | **M8** | **M10** | | **M12** | | **-** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | | - | | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | | | |
| | | ≥50 | ≥50 | 50 | 80 | 200 | 50 | 80 | 200 | 85 | |
| **15 / 12 N/mm²** | w/w w/d | 2,5 | 2,5 | 2,0 | 3,0 | 7,5 | 2,0 | 3,5 | 5,0 | 3,5 | |
| | d/d | 4,0 | 4,0 | 3,5 | 5,0 | 12,0 | 3,0 | 5,5 | 8,0 | 5,5 | |
| **25 / 20 N/mm²** | w/w w/d | 3,5 | 3,5 | 3,0 | 4,5 | 11,0 | 3,0 | 5,0 | 7,0 | 5,0 | |
| | d/d | 5,5 | 5,5 | 5,0 | 7,0 | 12,0 | 4,5 | 8,0 | 11,5 | 8,0 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C5.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading for edge distance c=100mm

| **Anchor rod** | | **M6** | **M8** | **M10** | | **M12** | | **-** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | | - | | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | | | |
| | | ≥50 | ≥50 | ≥50 | 200 | ≥50 | 200 | 85 | | | |
| **15 / 12 N/mm²** | w/w w/d d/d | 2,5 | 2,5 | 4,0 | 8,5 | 4,0 | 11,5 | 2,5 | | | |
| **25 / 20 N/mm²** | w/w w/d d/d | 4,0 | 4,0 | 6,0 | 12,0 | 5,5 | 12,0 | 4,0 | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid brick Mz, NF, Characteristic resistance under tension and shear loading, edge distance c=100mm

**Annex C5**

Deutsches Institut für Bautechnik DIBt

## Solid brick Mz, NF, EN 771-1:2011+A1:2015

### Table C6.1: Installation parameters for edge distance c=60mm

| **Anchor rod** | | | **M6** | **M8** | **M10** | **M12** | **M16** | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| **Anchor rod and Selkent internal threaded anchor E without perforated sleeve** | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 50 | 50 | 50 | 50 | 50 | 85 | | | |
| | | | 100 | 100 | 100 | 100 | 100 | | | | |
| | | | 200 | 200 | 200 | 200 | 200 | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 4 | 10 | | | | 4 | 10 | | |
| **General installation parameters** | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | |
| Edge distance $h_{ef}$=200 | $c_{min}$ | | 60 | | | | | | | | |
| Spacing | $s_{min}$ II,N | | 80 | | | | | | | | |
| | $h_{ef}$=200 $s_{min}$ II,N | | 80 | | | | | | | | |
| | $s_{min}$ II,v | | 80 | | | | | | | | |
| | $s_{cr}$ II | | 3x $h_{ef}$ | | | | | | | | |
| | $s_{min}$ ⊥ | | 80 | | | | | | | | |
| | $s_{cr}$ ⊥ | | 3x $h_{ef}$ | | | | | | | | |
| **Drilling method** | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | |

### Table C6.2: Group factors

| **Anchor rods** | | | **M6** | **M8** | **M10** | **M12** | **M16** | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| Edge distance | $c_{min}$ | [mm] | 60 | | | | | | | | |
| Group factor | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 0,6 | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | 1,3 | | | | | | | | |
| | $h_{ef}$=200 $\alpha_{g,N}$ ($s_{min}$ II) | | 1,4 | | | | | | | | |
| | $h_{ef}$=200 $\alpha_{g,V}$ ($s_{min}$ II) | | 1,5 | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 0,3 | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,3 | | | | | | | | |
| | $h_{ef}$=200 $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 2,0 | | | | | | | | |
| | $h_{ef}$=200 $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,1 | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid brick Mz, NF, dimensions, installation parameters, edge distance c=60mm, Group factors

**Annex C6**

Deutsches Institut für Bautechnik DIBt

## Solid brick Mz, NF, EN 771-1:2011+A1:2015

**Table C7.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading for edge distance c=60mm

| **Anchor rod** | | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | **-** |
|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | - | - | **M6** **M8** **11x85** | **M10** **M12** **15x85** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [3]** | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | |
| | | 50 100 | 50 100 | 50 100 200 | 50 100 200 | 50 100 200 | 85 | |
| **15 / 12 N/mm²** | w/w w/d | 1,5 | 2,0 2,0 | 2,0 2,5 -[2] | 2,0 2,5 -[2] | 2,0 5,5 -[2] | -[2] | |
| | d/d | 2,5 | 3,0 4,0 | 3,0 4,0 9,5 | 3,0 4,0 9,5 | 3,0 8,5 9,5 | -[2] | |
| **25 / 20 N/mm²** | w/w w/d | 2,0 | 2,5 3,0 | 2,5 3,5 -[2] | 3,0 3,5 -[2] | 3,0 7,5 -[2] | -[2] | |
| | d/d | 3,5 | 4,5 5,5 | 4,5 5,5 12 | 4,5 5,5 12 | 4,5 12 12 | -[2] | |
| **35 / 28 N/mm²** | w/w w/d | 2,5 | 3,0 4,0 | 3,0 4,0 -[2] | 3,5 4,0 -[2] | 3,5 9,0 -[2] | -[2] | |
| | d/d | 4,0 | 5,5 6,5 | 5,5 6,5 12 | 5,5 6,5 12 | 5,5 12 12 | -[2] | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] No performance assessed.
[3] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C7.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading for edge distance c=60mm

| **Anchor rod** | | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | **-** |
|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | - | - | **M6** **M8** **11x85** | **M10** **M12** **15x85** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | |
| | | 50 100 | 50 100 | 50 100 200 | 50 100 200 | 50 100 200 | 85 | |
| **15 / 12 N/mm²** | w/w w/d d/d | 1,2 2,5 | 1,2 3,0 | 2,0 3,0 1,5 | 1,5 3,0 3,0 | 0,6 3,0 4,5 | -[2] | |
| **25 / 20 N/mm²** | | 1,5 3,5 | 1,5 4,5 | 3,0 4,5 2,5 | 2,0 4,5 4,5 | 0,9 4,5 6,0 | -[2] | |
| **35 / 28 N/mm²** | | 2,0 4,0 | 2,0 5,0 | 3,5 5,0 3,0 | 2,5 5,0 5,0 | 1,2 5,0 7,5 | -[2] | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] No performance assessed.

Factor for job site tests and displacements see annex C123.

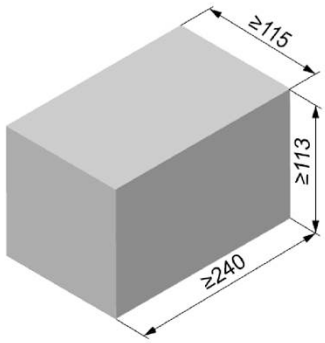
Injection system Selkent SEL-V+ for masonry

**Performance**
Solid brick Mz, NF, Characteristic resistance under tension and shear loading, edge distance c=60mm

**Annex C7**

Deutsches Institut für Bautechnik DIBt

## Solid brick Mz, 2DF, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 240 | ≥ 115 | ≥ 113 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,8 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 12,5 / 10 or 20 / 16 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |

### Table C8.1: Installation parameters

| **Anchor rod** | | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | - | | - | | - | | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | | | | | | **11x85** | | **15x85** | |
| **Anchor rod and Selkent internal threaded anchor E without perforated sleeve** | | | | | | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 85 | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 4 | | 10 | | | | | | | | 4 | | 10 | |
| **Anchor rod and Selkent internal threaded anchor E with perforated sleeve Selkent H 16x85 K** | | | | | | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | -[2] | | 85 | | -[2] | | | | | | 85 | | -[2] | |
| Max. installation torque | max $T_{inst}$ | [Nm] | | | 10 | | | | | | | | 4 | 10 | | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | | | |
| Spacing | $s_{min}$ ∥ | | 120 | | | | | | | | | | | | | |
| | $s_{cr}$ ∥ | | 240 | | | | | | | | | | | | | |
| | $s_{cr}$ ⊥ = $s_{min}$ ⊥ | | 115 | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] No performance assessed.

### Table C8.2: Group factors

| **Anchor rods** | | **M6** | **M8** | **M10** | **M12** | **M16** | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | **11x85** | | **15x85** | |
| Group factor | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,5 | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | 1,4 | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 2,0 | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid brick Mz, 2DF, dimensions, installation parameters, Group factors

**Annex C8**

Deutsches Institut für Bautechnik DIBt

## Solid brick Mz, 2DF, EN 771-1:2011+A1:2015

**Table C9.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | | **-** | | **M8** | **M10** | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** | - | - | **M6** | **M8** |
| | | | | | | **11x85** | | **15x85** | | | | **11x85** | |
| **Perforated sleeve Selkent H K** | - | - | - | - | - | - | | - | | **16x85** | | | |

**$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]**

| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 85 | |
| **12,5 / 10 N/mm²** | w/w w/d | 1,5 | 2,5 | 1,5 | 2,5 | 1,5 | 3,0 | 2,0 | 3,5 | 2,0 | 3,5 | 2,0 | 1,5 |
| | d/d | 3,0 | 4,0 | 3,0 | 4,0 | 3,0 | 4,5 | 3,0 | 5,5 | 3,0 | 5,5 | 3,0 | 3,0 |
| **20 / 16 N/mm²** | w/w w/d | 2,5 | 4,0 | 2,5 | 4,0 | 2,5 | 4,5 | 3,5 | 5,5 | 3,5 | 5,5 | 3,5 | 2,5 |
| | d/d | 4,5 | 7,0 | 4,5 | 7,0 | 4,5 | 7,5 | 5,5 | 8,0 | 5,5 | 8,0 | 5,5 | 4,5 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C9.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | | **-** | | **M8** | **M10** | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** | - | - | **M6** | **M8** |
| | | | | | | **11x85** | | **15x85** | | | | **11x85** | |
| **Perforated sleeve Selkent H K** | - | - | - | - | - | - | | - | | **16x85** | | | |

**$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C**

| Mean compressive strength / Min. compressive strength single brick[1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ≥ 50 | | | | | 85 | | | | | | | | |
| **12,5 / 10 N/mm²** | w/w w/d<br>d/d | 2,5 | 3,0 | 3,0 | 3,5 | 3,0 | 2,5 | 3,0 | 3,0 | 3,0 | 3,0 | 3,5 | 2,5 | 3,0 | |
| **20 / 16 N/mm²** | w/w w/d<br>d/d | 4,0 | 5,0 | 5,5 | 5,5 | 5,0 | 4,0 | 5,0 | 5,0 | 5,0 | 5,0 | 6,0 | 4,0 | 5,0 | |

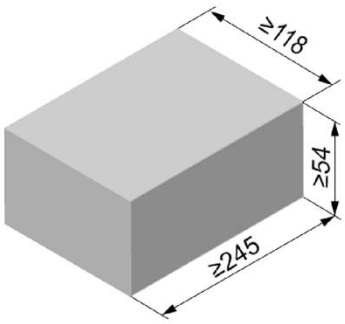
[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C9** |
|---|---|
| **Performance**<br>Solid brick Mz, 2DF, Characteristic resistance under tension and shear loading | |

Deutsches Institut für Bautechnik DIBt

## Solid brick Mz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Nigra | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 245 | ≥ 118 | ≥ 54 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,8 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 12,5 / 10 or 25 / 20 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |

### Table C10.1: Installation parameters

| **Anchor rod** | | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | - | | - | | - | | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | | | | | | **11x85** | | **15x85** | |
| **Anchor rod and Selkent internal threaded anchor E without perforated sleeve** | | | | | | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 85 | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 4 | | 10 | | | | | | | | 4 | | 10 | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | | | |
| Spacing | $s_{cr}$ II = $s_{min}$ II | | 245 | | | | | | | | | | | | | |
| | $s_{cr} \perp = s_{min} \perp$ | | 60 | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C10.2: Group factors

| **Anchor rods** | | | **M6** | **M8** | **M10** | **M12** | **M16** | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| Group factor | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 2 | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid brick Mz, dimensions, installation parameters, Group factors

**Annex C10**

Deutsches Institut für Bautechnik DIBt

## Solid brick Mz, EN 771-1:2011+A1:2015

**Table C11.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | **11x85** | | **15x85** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | |
| Mean compressive strength/ Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] ≥ 50 | | | | | 85 | | | |
| **12,5 / 10 N/mm²** | w/w w/d | 0,60 | 0,90 | 0,75 | 0,75 | 0,75 | 0,60 | 0,75 | | |
| | d/d | 1,20 | 1,50 | 1,20 | 1,20 | 1,20 | 1,20 | 1,20 | | |
| **25 / 20 N/mm²** | w/w w/d | 0,90 | 1,50 | 1,20 | 1,20 | 1,20 | 0,90 | 1,20 | | |
| | d/d | 1,50 | 2,50 | 2,00 | 2,00 | 2,00 | 1,50 | 2,00 | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C11.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | **11x85** | | **15x85** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] ≥ 50 | | | | | 85 | | | |
| **12,5 / 10 N/mm²** | w/w w/d d/d | 2,0 | 3,0 | 4,0 | 4,5 | 5,5 | 2,0 | 3,0 | 4,0 | 4,5 |
| **25 / 20 N/mm²** | w/w w/d d/d | 2,5 | 4,0 | 5,5 | 6,0 | 8,0 | 2,5 | 4,0 | 5,5 | 6,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C11** |
|---|---|
| **Performance**<br>Solid brick Mz, Characteristic resistance under tension and shear loading | |

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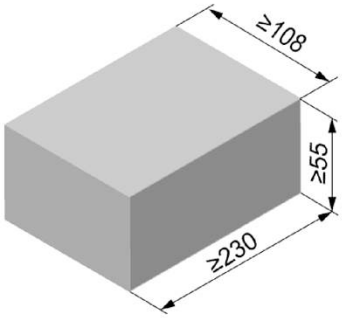
## Solid brick Mz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 230 | ≥ 108 | ≥ 55 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,8 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 12,5 / 10 or 25 / 20 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |

### Table C12.1: Installation parameters

| **Anchor rod** | | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | - | | - | | - | | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | | | | | | **11x85** | | **15x85** | |
| **Anchor rod and Selkent internal threaded anchor E without perforated sleeve** | | | | | | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 50 | 90 | 50 | 90 | 50 | 90 | 50 | 90 | 50 | 90 | 85 | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 4 | | 10 | | | | | | | | 4 | | 10 | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | | | |
| Spacing | $s_{cr} \parallel = s_{min} \parallel$ | | 230 | | | | | | | | | | | | | |
| | $s_{cr} \perp = s_{min} \perp$ | | 60 | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C12.2: Group factors

| **Anchor rods** | | | **M6** | **M8** | **M10** | **M12** | **M16** | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| Group factor | $\alpha_{g,N}$ ($s_{min} \parallel$) | [-] | 2 | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min} \parallel$) | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid brick Mz, dimensions, installation parameters, Group factors

**Annex C12**

Deutsches Institut für Bautechnik DIBt

## Solid brick Mz, EN 771-1:2011+A1:2015

**Table C13.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | | |
| | | | ≥ 50 | | | | | 85 | | | |
| **12,5 / 10 N/mm²** | w/w | w/d | 0,60 | 0,90 | 0,75 | 0,75 | 0,75 | 0,75 | | | |
| | d/d | | 1,20 | 1,50 | 1,20 | 1,20 | 1,20 | 1,20 | | | |
| **25 / 20 N/mm²** | w/w | w/d | 0,90 | 1,50 | 1,20 | 1,20 | 1,20 | 1,20 | | | |
| | d/d | | 1,50 | 2,50 | 2,00 | 2,00 | 2,00 | 2,00 | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C13.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | | |
| | | | ≥ 50 | | | | | 85 | | | |
| **12,5 / 10 N/mm²** | w/w | w/d | 2,0 | 3,0 | 4,0 | 4,5 | 5,5 | 2,0 | 3,0 | 4,0 | 4,5 |
| | d/d | | | | | | | | | | |
| **25 / 20 N/mm²** | w/w | w/d | 2,5 | 4,0 | 5,5 | 6,0 | 8,0 | 2,5 | 4,0 | 5,5 | 6,0 |
| | d/d | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

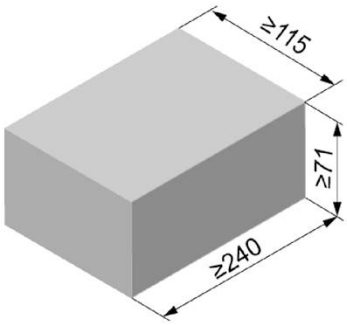
Injection system Selkent SEL-V+ for masonry

**Performance**
Solid brick Mz, Characteristic resistance under tension and shear loading

**Annex C13**

Deutsches Institut für Bautechnik DIBt

## Solid calcium silicate brick KS, NF, EN 771-2:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | - | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 240 | ≥ 115 | ≥ 71 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,8 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 15 / 12 or 25 / 20 or 35 / 28 | | |
| Standard or annex | | EN 771-2:2011+A1:2015 | | |

### Table C14.1: Installation parameters

| **Anchor rod** | | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | - | | - | | - | | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | | | | | | **11x85** | | **15x85** | |
| **Anchor rod and Selkent internal threaded anchor E without perforated sleeve** | | | | | | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 85 | | 85 | |
| | | | | | | | 200 | | 200 | | 200 | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 3 | | 5 | | 15 | | 15 | | 25 | | 3 | 5 | 15 | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | | | |
| Spacing | $s_{min}$ II | | 80 | | | | | | | | | | | | | |
| | $s_{cr}$ II | | 80 | | | | | | | | | | | | | |
| | $s_{min} \perp$ | | 3x $h_{ef}$ | | | | | | | | | | | | | |
| | $s_{cr} \perp$ | | 3x $h_{ef}$ | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength..

### Table C14.2: Group factors

| **Anchor rod** | | | **M6** | **M8** | **M10** | **M12** | **M16** | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| Group factor | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 0,7 | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | 1,3 | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | 2,0 | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | 2,0 | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid calcium silicate brick KS, NF, dimensions, installation parameters, Group factors

**Annex C14**

Deutsches Institut für Bautechnik DIBt

## Solid calcium silicate brick KS, NF, EN 771-2:2011+A1:2015

**Table C15.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M6** | **M8** | **M10** | **M12** | **M16** | - | - |
|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | - | - | **M6** \| **M8** | **M10** \| **M12** |
| | | | | | | | **11x85** | **15x85** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | |
| | | 50 | 100 | 50 | 100 | 50 | 100 | 200 |
| **15 / 12 N/mm²** | w/w \| w/d | 2,0 | 3,0 | 2,5 | 4,5 | 2,5 | 3,5 | 7,0 |
| | d/d | 4,0 | 5,5 | 4,0 | 8,0 | 4,0 | 5,5 | 12 |
| **25 / 20 N/mm²** | w/w \| w/d | 3,0 | 4,5 | 3,5 | 6,5 | 3,5 | 4,5 | 10 |
| | d/d | 5,5 | 7,5 | 6,0 | 11 | 6,0 | 8,0 | 12 |
| **35 / 28 N/mm²** | w/w \| w/d | 3,5 | 5,0 | 4,0 | 8,0 | 4,5 | 5,5 | 12 |
| | d/d | 6,5 | 9,0 | 7,0 | 12 | 7,0 | 9,0 | 12 |

| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | 50 | 100 | 50 | 100 | 50 | 100 | 200 | 85 | 85 |
|---|---|---|---|---|---|---|---|---|---|---|
| **15 / 12 N/mm²** | w/w \| w/d | 2,5 | 3,0 | 2,5 | 4,5 | 2,5 | 3,5 | 7,0 | 2,5 | 2,5 |
| | d/d | 4,0 | 5,5 | 4,0 | 8,0 | 4,0 | 5,5 | 12 | 4,0 | 4,0 |
| **25 / 20 N/mm²** | w/w \| w/d | 3,0 | 4,5 | 3,5 | 6,5 | 3,5 | 4,5 | 10 | 3,5 | 3,5 |
| | d/d | 5,5 | 7,5 | 6,0 | 11 | 6,0 | 8,0 | 12 | 6,0 | 6,0 |
| **35 / 28 N/mm²** | w/w \| w/d | 3,5 | 5,0 | 4,0 | 8,0 | 4,5 | 5,5 | 12 | 4,5 | 4,5 |
| | d/d | 6,5 | 9,0 | 7,0 | 12 | 7,0 | 9,0 | 12 | 7,0 | 7,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C15.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M6** | **M8** | **M10** | **M12** | **M16** | - | - |
|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | - | - | **M6** \| **M8** | **M10** \| **M12** |
| | | | | | | | **11x85** | **15x85** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | |
| | | 50 | 100 | 50 | 100 | 50 | ≥100 | |
| **15 / 12 N/mm²** | w/w \| w/d | 1,5 | 3,0 | 1,5 | 3,0 | 1,2 | 2,0 | |
| | d/d | | | | | | | |
| **25 / 20 N/mm²** | w/w \| w/d | 2,5 | 4,0 | 2,5 | 4,0 | 1,5 | 3,0 | |
| | d/d | | | | | | | |
| **35 / 28 N/mm²** | w/w \| w/d | 3,0 | 4,5 | 3,0 | 4,5 | 1,5 | 3,5 | |
| | d/d | | | | | | | |

| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | 50 | 100 | 50 | 100 | 50 | ≥100 | 50 | ≥100 | 50 | ≥100 | 85 | 85 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **15 / 12 N/mm²** | w/w \| w/d | 1,5 | 3,0 | 1,5 | 3,0 | 1,2 | 2,0 | 1,2 | 2,0 | 1,2 | 2,0 | 1,2 | 1,2 |
| | d/d | | | | | | | | | | | | |
| **25 / 20 N/mm²** | w/w \| w/d | 2,5 | 4,0 | 2,5 | 4,0 | 1,5 | 3,0 | 1,5 | 3,0 | 1,5 | 3,0 | 1,5 | 1,5 |
| | d/d | | | | | | | | | | | | |
| **35 / 28 N/mm²** | w/w \| w/d | 3,0 | 4,5 | 3,0 | 4,5 | 1,5 | 3,5 | 1,5 | 3,5 | 1,5 | 3,5 | 1,5 | 1,5 |
| | d/d | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

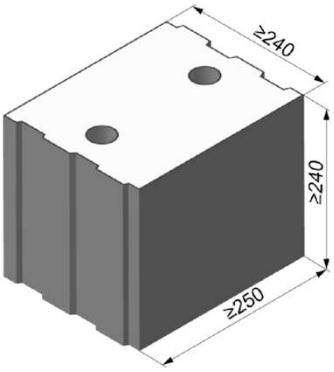
Injection system Selkent SEL-V+ for masonry

**Performance**
Solid calcium silicate brick KS, NF, Characteristic resistance under tension and shear loading

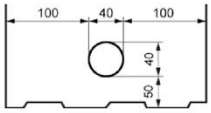
**Annex C15**

Deutsches Institut für Bautechnik DIBt

## Solid calcium silicate brick KS, 8DF, EN 771-2:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | - | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 250 | ≥ 240 | ≥ 240 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 2,0 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 12,5 / 10 or 25 / 20 or 35 / 28 | | |
| Standard or annex | | EN 771-2:2011+A1:2015 | | |




Dimension see also Annex B15

### Table C16.1: Installation parameters

| **Anchor rod** | | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | - | | - | | - | | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | | | | | | **11x85** | | **15x85** | |
| **Anchor rod and Selkent internal threaded anchor E without perforated sleeve** | | | | | | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 85 | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 4 | | 10 | | | | | | | | 4 | | 10 | |
| **Anchor rod and Selkent internal threaded anchor E with perforated sleeve Selkent H 16x85 K** | | | | | | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | -[2] | | 85 | | | | -[2] | | | | 85 | | -[2] | |
| Max. installation torque | max $T_{inst}$ | [Nm] | | | 10 | | | | | | | | 4 | 10 | | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | | | |
| Spacing | $s_{min}$ ∥ | | 80 | | | | | | | | | | | | | |
| | $s_{cr}$ ∥ | | 3x $h_{ef}$ | | | | | | | | | | | | | |
| | $s_{min}$ ⊥ | | 80 | | | | | | | | | | | | | |
| | $s_{cr}$ ⊥ | | 3x $h_{ef}$ | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] No performance assessed.

### Table C16.2: Group factors

| **Anchor rods** | | | **M6** | **M8** | **M10** | **M12** | **M16** | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,5 | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | 1,2 | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,5 | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,2 | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid calcium silicate brick KS, 8DF, dimensions, installation parameters, Group factors

**Annex C16**

Deutsches Institut für Bautechnik DIBt

## Solid calcium silicate brick KS, 8DF, EN 771-2:2011+A1:2015

**Table C17.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | | **-** | | **M8** | **M10** | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** | - | - | **M6** | **M8** |
| | | | | | | **11x85** | | **15x85** | | | | **11x85** | |
| **Perforated sleeve Selkent H K** | - | - | - | - | - | - | | - | | **16x85** | | | |

**$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]**

| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ≥ 50 | | | | | 85 | | | | |
| **12,5 / 10 N/mm²** | w/w w/d | 3,0 | 4,0 | 4,5 | 4,5 | 3,5 | 3,0 | 3,5 | 4,5 | 3,0 | 4,5 |
| | d/d | 5,0 | 7,0 | 7,0 | 7,0 | 5,5 | 5,0 | 5,5 | 8,0 | 5,0 | 8,0 |
| **25 / 20 N/mm²** | w/w w/d | 4,5 | 6,0 | 6,0 | 6,0 | 5,0 | 4,5 | 5,0 | 6,5 | 4,5 | 6,5 |
| | d/d | 7,5 | 10,0 | 10,0 | 10,0 | 7,5 | 7,5 | 7,5 | 11,0 | 7,5 | 11 |
| **35 / 28 N/mm²** | w/w w/d | 5,0 | 8,0 | 8,5 | 8,5 | 7,0 | 5,0 | 7,0 | 8,5 | 5,0 | 8,5 |
| | d/d | 8,5 | 12,0 | 12,0 | 12,0 | 11,0 | 8,5 | 11,0 | 12,0 | 8,5 | 12 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C17.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | | **-** | | **M8** | **M10** | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** | - | - | **M6** | **M8** |
| | | | | | | **11x85** | | **15x85** | | | | **11x85** | |
| **Perforated sleeve Selkent H K** | - | - | - | - | - | - | | - | | **16x85** | | | |

**$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C**

| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ≥ 50 | | | | | 85 | | | | |
| **12,5 / 10 N/mm²** | w/w w/d d/d | 2,5 | 4,5 | | | | 2,5 | 4,5 | 4,5 | 2,5 | 4,5 |
| **25 / 20 N/mm²** | w/w w/d d/d | 4,0 | 6,5 | | | | 4,0 | 6,5 | 6,5 | 4,0 | 6,5 |
| **35 / 28 N/mm²** | w/w w/d d/d | 5,0 | 9,0 | | | | 5,0 | 9,0 | 9,0 | 5,0 | 9,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

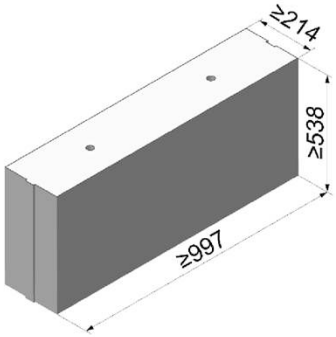
Injection system Selkent SEL-V+ for masonry

**Performance**
Solid calcium silicate brick KS, 8DF, Characteristic resistance under tension and shear loading

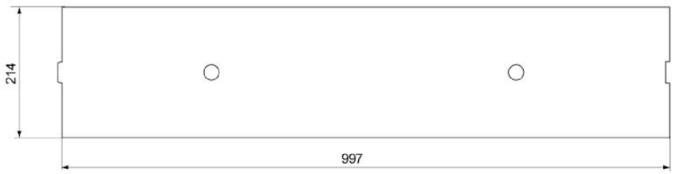
**Annex C17**

Deutsches Institut für Bautechnik DIBt

## Solid calcium silicate brick KS, EN 771-2:2011+A1:2015




| Producer | | e.g. Calduran | | |
|---|---|---|---|---|
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 997 | ≥ 214 | ≥ 538 |
| Mean gross dry density ρ | [kg/dm³] | 1,8 | | 2,2 |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 12,5 / 10 or 25 / 20 | | 45 / 36 |
| Standard or annex | | EN 771-2:2011+A1:2015 | | |




### Table C18.1: Installation parameters

| **Anchor rod** | | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | - | | - | | - | | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | | | | | | **11x85** | | **15x85** | |
| **Anchor rod and Selkent internal threaded anchor E without perforated sleeve** | | | | | | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 85 | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 4 | | 10 | | | | | | | | 4 | | 10 | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 75 | | | | | | | | | | | | | |
| Spacing | $s_{cr}$ II = $s_{min}$ II | | 3x $h_{ef}$ | | | | | | | | | | | | | |
| | $s_{cr} \perp = s_{min} \perp$ | | 3x $h_{ef}$ | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C18.2: Group factors

| **Anchor rod** | | | **M6** | **M8** | **M10** | **M12** | **M16** | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 2 | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid calcium silicate brick KS, dimensions, installation parameters, Group factors

**Annex C18**

Deutsches Institut für Bautechnik DIBt

## Solid calcium silicate brick KS, EN 771-2:2011+A1:2015

**Table C19.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M6** | **M8** | **M10** | **M12** | **M16** | - | - |
|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | - | - | **M6** **M8** | **M10** **M12** |
| | | | | | | | **11x85** | **15x85** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | |
| | | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 85 |
| **12,5 / 10 N/mm²** | w/w w/d | 4,0 | | 4,0 | 7,0 | 5,0 | 6,0 | 5,0 | 6,0 | 5,5 | 7,5 | 5,5 |
| | d/d | 7,0 | | 7,0 | 12,0 | 8,0 | 9,5 | 8,0 | 10,0 | 9,0 | 11,5 | 9,0 |
| **25 / 20 N/mm²** | w/w w/d | 5,5 | | 6,0 | 10,0 | 7,0 | 8,5 | 7,0 | 9,0 | 8,0 | 11,0 | 8,0 |
| | d/d | 8,5 | | 10,5 | 12,0 | 11,5 | 12,0 | 11,0 | 12,0 | 12,0 | 12,0 | 12,0 |
| **45 / 36 N/mm²** | w/w w/d | 4,5 | | 8,0 | 12,0 | 11,5 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 |
| | d/d | 8,0 | | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C19.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M6** | **M8** | **M10** | **M12** | **M16** | - | - |
|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | - | - | **M6** **M8** | **M10** **M12** |
| | | | | | | | **11x85** | **15x85** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | |
| | | ≥ 50 | | | | | 85 | | | |
| **12,5 / 10 N/mm²** | w/w w/d | 3,0 | 5,0 | 5,5 | 4,0 | 4,0 | 3,0 | 5,0 | 5,5 | 4,0 |
| | d/d | | | | | | | | | |
| **25 / 20 N/mm²** | w/w w/d | 4,5 | 7,0 | 7,5 | 6,0 | 6,0 | 4,5 | 7,0 | 7,5 | 6,0 |
| | d/d | | | | | | | | | |
| **45 / 36 N/mm²** | w/w w/d | 4,5 | 9,0 | 11,0 | 12,0 | 12,0 | 4,5 | 9,0 | 11,0 | 12,0 |
| | d/d | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C19** |
|---|---|
| **Performance**<br>Solid calcium silicate brick KS, Characteristic resistance under tension and shear loading | |

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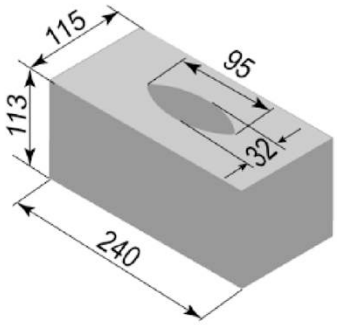
## Solid calcium silicate brick KS, EN 771-2:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | - | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 240 | ≥ 115 | ≥ 113 |
| Mean gross dry density ρ | [kg/dm³] | 1,8 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 12,5 / 10 or 25 / 20 | | |
| Standard or annex | | EN 771-2:2011+A1:2015 | | |

**Table C20.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **M6 M8** **11x85** | **-** | | **-** | | **M10 M12** **15x85** | **-** | | **-** | |
| **Selkent perforated sleeve H K** | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | 4 | | | | | |
| **General installation parameters** | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 100 | | | | | | |
| Spacing | $s_{min} \parallel$ | | 255 | 255 | | 390 | | 255 | 390 |
| | $s_{cr} \parallel$ | | | | | | | | |
| | $s_{min} \perp$ | | | | | | | | |
| | $s_{cr} \perp$ | | | | | | | | |
| **Drilling method** | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C20.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M8** | **M10** | **M8** | **M10** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | **12x85** | | **16x85** | | **16x130** | | **20x85** | | **20x130** | |

| | | | |
|---|---|---|---|
| Group factors | $\alpha_{g,N}(s_{min} \parallel) = \alpha_{g,V}(s_{min} \parallel)$ | [-] | 2 |
| | $\alpha_{g,N}(s_{min} \perp) = \alpha_{g,V}(s_{min} \perp)$ | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid calcium silicate brick KS, dimensions, installation parameters, Group factors

**Annex C20**

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## Solid calcium silicate brick KS, EN 771-2:2011+A1:2015

**Table C21.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 4 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 100 | | |
| Spacing | $s_{min} \parallel$ | | 390 | | |
| | $s_{cr} \parallel$ | | 390 | | |
| | $s_{min} \perp$ | | 390 | | |
| | $s_{cr} \perp$ | | 390 | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C21.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min} \parallel$) | [-] | 2 | | |
| | $\alpha_{g,V}$ ($s_{min} \parallel$) | | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid calcium silicate brick KS, dimensions, installation parameters, Group factors

**Annex C21**

Deutsches Institut für Bautechnik DIBt

## Solid calcium silicate brick, EN 771-2:2011+A1:2015

**Table C22.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use con-ditions | | | | | | | | | | | | | | |
| **12,5 / 10 N/mm²** | w/w | 3,5 | | 2,0 | | 2,0 | | 2,0 | | 6,5 | | | | 4,5 | |
| | d/d | 6,0 | | 4,0 | | 3,5 | | 3,5 | | 10,5 | | | | 7,0 | |
| **25 / 20 N/mm²** | w/w | 5,0 | | 3,0 | | 3,0 | | 3,0 | | 9,5 | | | | 6,0 | |
| | d/d | 8,5 | | 5,5 | | 5,5 | | 5,5 | | 12,0 | | | | 10,0 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C no performance assessed.

**Table C22.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use con-ditions | | | |
| **12,5 / 10 N/mm²** | w/w | 2,0 | | 4,5 |
| | d/d | 3,5 | | 7,0 |
| **25 / 20 N/mm²** | w/w | 3,0 | | 6,0 |
| | d/d | 5,5 | | 10,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C no performance assessed.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C22** |
|---|---|
| **Performance**<br>Solid calcium silicate brick KS, Characteristic resistance under tension loading | |

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**Table C23.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use con-ditions | | | | | | | | | | | | | | |
| **12,5 / 10 N/mm²** | w/w | 3,0 | | 3,5 | | | | | | | | | | | |
| | d/d | | | | | | | | | | | | | | |
| **25 / 20 N/mm²** | w/w | 4,0 | | 5,5 | | | | | | | | | | | |
| | d/d | | | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C no performance assessed.

**Table C23.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use con-ditions | | | |
| **12,5 / 10 N/mm²** | w/w | 3,5 | | |
| | d/d | | | |
| **25 / 20 N/mm²** | w/w | 5,5 | | |
| | d/d | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C no performance assessed.

Factor for job site tests and displacements see annex C123.

Injection system Selkent SEL-V+ for masonry

**Performance**
Solid calcium silicate brick KS, Characteristic resistance under shear loading

**Annex C23**

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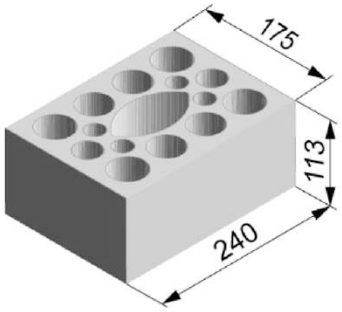
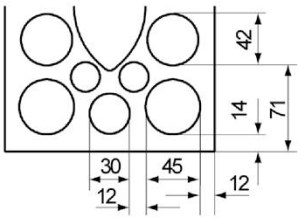
## Perforated calcium silicate brick KSL, 3DF, EN 771-2:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | | - | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 240 | 175 | 113 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,4 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 10 / 8 or 12,5 / 10 or 15 / 12 or 20 / 16 or 25 / 20 | | |
| Standard or annex | | EN 771-2:2011+A1:2015 | | |




Dimension see also Annex B15

**Table C24.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | **M6** **M8** **11x85** | - | | - | | **M10** **M12** **15x85** | - | | - | |
| **Selkent perforated sleeve H K** | | | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 2 | | | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | 80 | | | | | | | | | |
| Spacing | $s_{min}$ ∥ | | 100 | | | | | | | | | | | | | |
| | $s_{cr}$ ∥ | | 240 | | | | | | | | | | | | | |
| | $s_{min}$ ⊥ | | 115 | | | | | | | | | | | | | |
| | $s_{cr}$ ⊥ | | 115 | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C24.2:** Group factors

| **Anchor rod** | | | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | **M6** **M8** **11x85** | - | | - | | **M10** **M12** **15x85** | - | | - | |
| **Selkent perforated sleeve H K** | | | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) = $\alpha_{g,V}$ ($s_{min}$ ∥) | [-] | 1,5 | | | | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) = $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 2,0 | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Perforated calcium silicate brick KSL, 3DF, dimensions, installation parameters, Group factors

**Annex C24**

Deutsches Institut für Bautechnik DIBt

## Perforated calcium silicate brick KSL, 3DF, EN 771-2:2011+A1:2015

**Table C25.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 2 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 80 | | |
| Spacing | $s_{min}$ ∥ | | 100 | | |
| | $s_{cr}$ ∥ | | 240 | | |
| | $s_{min}$ ⊥ | | 115 | | |
| | $s_{cr}$ ⊥ | | 115 | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C25.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,5 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 2,0 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Perforated calcium silicate brick KSL, 3DF, dimensions, installation parameters, Group factors

**Annex C25**

Deutsches Institut für Bautechnik DIBt

## Perforated calcium silicate brick KSL, 3DF, EN 771-2:2011+A1:2015

**Table C26.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | | | |
| Mean compressive strength/ Min. comp. strength single brick [1)] | Use conditions | | | | | | | | | | | | | | | | |
| **10 / 8 N/mm²** | w/w w/d | 1,5 | | | | 2,0 | | | | 2,0 | | 2,0 | | | | 2,0 | |
| | d/d | 1,5 | | | | 2,0 | | | | 2,5 | | 2,5 | | | | 2,5 | |
| **12,5 / 10 N/mm²** | w/w w/d | 2,0 | | | | 2,0 | | | | 2,5 | | 2,5 | | | | 2,5 | |
| | d/d | 2,0 | | | | 2,5 | | | | 3,0 | | 3,0 | | | | 3,0 | |
| **15 / 12 N/mm²** | w/w w/d | 2,5 | | | | 2,5 | | | | 3,0 | | 3,0 | | | | 3,0 | |
| | d/d | 2,5 | | | | 3,0 | | | | 3,5 | | 3,5 | | | | 3,5 | |
| **20 / 16 N/mm²** | w/w w/d | 3,0 | | | | 3,5 | | | | 4,5 | | 4,5 | | | | 4,5 | |
| | d/d | 3,5 | | | | 4,0 | | | | 4,5 | | 4,5 | | | | 4,5 | |
| **25 / 20 N/mm²** | w/w w/d | 4,0 | | | | 4,5 | | | | 5,5 | | 5,5 | | | | 5,5 | |
| | d/d | 4,5 | | | | 5,0 | | | | 6,0 | | 6,0 | | | | 6,0 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C26.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. comp. strength single brick [1)] | Use conditions | | | |
| **10 / 8 N/mm²** | w/w w/d | 2,0 | | |
| | d/d | 2,5 | | |
| **12,5 / 10 N/mm²** | w/w w/d | 2,5 | | |
| | d/d | 3,0 | | |
| **15 / 12 N/mm²** | w/w w/d | 3,0 | | |
| | d/d | 3,5 | | |
| **20 / 16 N/mm²** | w/w w/d | 4,5 | | |
| | d/d | 4,5 | | |
| **25 / 20 N/mm²** | w/w w/d | 5,5 | | |
| | d/d | 6,0 | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.
Factor for job site tests and displacements see annex C123.

Injection system Selkent SEL-V+ for masonry

**Performance**
Perforated calcium silicate brick KSL, 3DF, Characteristic resistance under tension loading

**Annex C26**

Deutsches Institut für Bautechnik DIBt

## Perforated calcium silicate brick KSL, 3DF, EN 771-2:2011+A1:2015

**Table C27.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | | | | | | | | | |
| **10 / 8 N/mm²** | w/w, d/d | w/d | 1,5 | | | | | | 3,0 | | | | 2,5 | 3,0 | 2,5 | |
| **12,5 / 10 N/mm²** | w/w, d/d | w/d | 2,0 | | | | | | 3,5 | | | | | | | |
| **15 / 12 N/mm²** | w/w, d/d | w/d | 2,5 | | | | | | 4,5 | | | | 4,0 | 4,5 | 4,0 | |
| **20 / 16 N/mm²** | w/w, d/d | w/d | 3,0 | 3,5 | 3,0 | 3,5 | 3,0 | | 6,0 | | | | 5,5 | 6,0 | 5,5 | |
| **25 / 20 N/mm²** | w/w, d/d | w/d | 4,0 | 4,5 | 4,0 | 4,5 | 4,0 | | 7,5 | | | | 6,5 | 7,5 | 6,5 | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C27.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

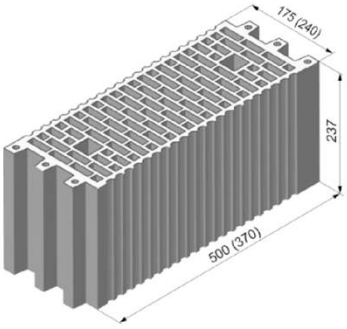
| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | |
| **10 / 8 N/mm²** | w/w, w/d, d/d | 3,0 | 2,5 |
| **12,5 / 10 N/mm²** | | 3,5 | 3,5 |
| **15 / 12 N/mm²** | | 4,5 | 4,0 |
| **20 / 16 N/mm²** | | 6,0 | 5,5 |
| **25 / 20 N/mm²** | | 7,5 | 6,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

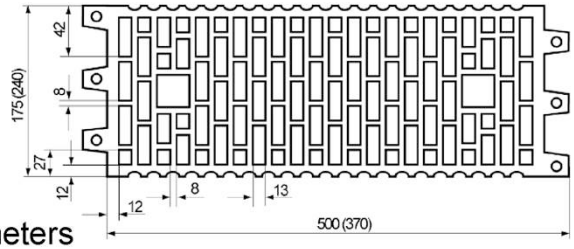
Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C27** |
|---|---|
| **Performance**<br>Perforated calcium silicate brick KSL, 3DF, Characteristic resistance under shear loading | |

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger, Poroton | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 500 | 175 | 237 |
| | | 370 | 240 | 237 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,0 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 5 / 4 or 7,5 / 6 or 10 / 8 or 12,5 / 10 or 15 / 12 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B15

### Table C28.1: Installation parameters

| **Anchor rod** | | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | **M6** | **M8** | - | | - | | **M10** | **M12** | - | | - | |
| | | | | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 2 | | | | | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 100 | | | | | | | | | | | | | | | |
| Spacing | $s_{min}$ ∥ | | 100 | | | | | | | | | | | | | | | |
| | $s_{cr}$ ∥ | | 500 (370) | | | | | | | | | | | | | | | |
| | $s_{min}$ ⊥ | | 100 | | | | | | | | | | | | | | | |
| | $s_{cr}$ ⊥ | | 240 | | | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C28.2: Group factors

| **Anchor rod** | | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | **M6** | **M8** | - | | - | | **M10** | **M12** | - | | - | |
| | | | | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| Group factors | $\alpha_{g,N}(s_{min} \parallel) = \alpha_{g,V}(s_{min} \parallel)$ / $\alpha_{g,N}(s_{min} \perp) = \alpha_{g,V}(s_{min} \perp)$ | [-] | 1 | | | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C28**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C29.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6** / **11x85** | **M8** / **11x85** | - | - | | **M10** / **15x85** | **M12** / **15x85** | - | - | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | |
|---|---|---|---|---|---|
| Mean compressive strength / Min. comp. strength single brick [1)] | Use conditions | | | | |
| **5 / 4 N/mm²** | w/w \| w/d | 0,30 | 0,90 | | 1,20 |
| | d/d | 0,40 | 0,90 | | 1,20 |
| **7,5 / 6 N/mm²** | w/w \| w/d | 0,50 | 1,50 | | 2,00 |
| | d/d | 0,60 | 1,50 | | 2,00 |
| **10 / 8 N/mm²** | w/w \| w/d | 0,75 | 2,00 | | 2,50 |
| | d/d | 0,75 | 2,00 | | 2,50 |
| **12,5 / 10 N/mm²** | w/w \| w/d | 0,90 | 2,50 | | 3,00 |
| | d/d | 0,90 | 2,50 | | 3,50 |
| **15 / 12 N/mm²** | w/w \| w/d | 0,90 | 3,00 | | 3,50 |
| | d/d | 1,20 | 3,00 | | 4,00 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C29.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6** / **11x85** | **M8** / **11x85** | - | - | | **M10** / **15x85** | **M12** / **15x85** | - | - | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |

| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | |
|---|---|---|---|---|---|
| Mean compressive strength / Min. comp. strength single brick [1)] | Use conditions | | | | |
| **5 / 4 N/mm²** | w/w<br>w/d<br>d/d | 0,50 | 0,60 | 0,50 | 0,60 |
| **7,5 / 6 N/mm²** | | 0,75 | 0,90 | 0,75 | 0,90 |
| **10 / 8 N/mm²** | | 0,90 | 1,20 | 0,90 | 1,20 |
| **12,5 / 10 N/mm²** | | 1,20 | 1,50 | 1,20 | 1,50 |
| **15 / 12 N/mm²** | | 1,50 | 2,00 | 1,50 | 2,00 |

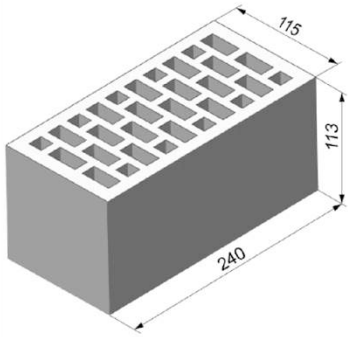
[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

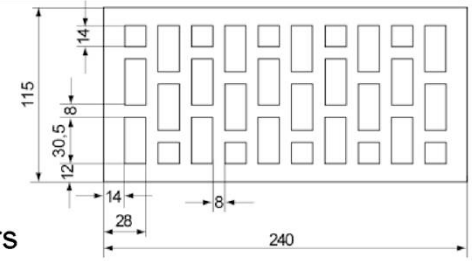
| Injection system Selkent SEL-V+ for masonry | **Annex C29** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under tension and shear loading | |

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, 2DF, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | | e.g. Wienerberger | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 240 | 115 | 113 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,4 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 7,5 / 6 or 12,5 / 10 or 20 / 16 or 25 / 20 or 35 / 28 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B15

### Table C30.1: Installation parameters

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** / **11x85** | **M8** / **11x85** | **-** | **M10** / **15x85** | **M12** / **15x85** | **-** |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **20x85** | | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | |
| Max. installation torque $\max T_{inst}$ | [Nm] | 2 | | | | | | | | |
| **General installation parameters** | | | | | | | | | | |
| Edge distance $c_{min} = c_{cr}$ | [mm] | 80 | | | | | | | | |
| Spacing $s_{cr}$ II = $s_{min}$ II | [mm] | 240 | | | | | | | | |
| Spacing $s_{cr} \perp = s_{min} \perp$ | [mm] | 115 | | | | | | | | |
| **Drilling method** | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C30.2: Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** / **11x85** | **M8** / **11x85** | **-** | **M10** / **15x85** | **M12** / **15x85** | **-** |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **20x85** | | |
| Group factors $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 2 | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min}$ II) | [-] | 2 | | | | | | | | |
| Group factors $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | 2 | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | 2 | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, 2DF, dimensions, installation parameters, Group factors

**Annex C30**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, 2DF, EN 771-1:2011+A1:2015

**Table C31.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | | **M6** **M8** **11x85** | - | | **M10** **M12** **15x85** | - | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | **20x85** | | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | |
| **7,5 / 6 N/mm²** | w/w w/d | 0,75 | | 0,90 | | 0,75 | | | 0,90 | | |
| | d/d | 0,75 | | 1,20 | | 0,75 | | | 0,90 | | |
| **12,5 / 10 N/mm²** | w/w w/d | 1,20 | | 1,50 | | 1,20 | | | 1,50 | | |
| | d/d | 1,20 | | 2,00 | | 1,20 | | | 1,50 | | |
| **20 / 16 N/mm²** | w/w w/d | 2,00 | | 2,50 | | 2,00 | | | 2,00 | | |
| | d/d | 2,00 | | 3,00 | | 2,00 | | | 2,50 | | |
| **25 / 20 N/mm²** | w/w w/d | 2,50 | | 3,50 | | 2,50 | | | 3,00 | | |
| | d/d | 2,50 | | 4,00 | | 2,50 | | | 3,00 | | |
| **35 / 28 N/mm²** | w/w w/d | 3,00 | | 5,00 | | 3,50 | | | 4,00 | | |
| | d/d | 3,50 | | 5,50 | | 3,50 | | | 4,50 | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C31.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | | **M6** **M8** **11x85** | - | | **M10** **M12** **15x85** | - | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | **20x85** | | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | |
| **7,5 / 6 N/mm²** | w/w w/d d/d | 1,2 | 1,5 | 1,2 | 2,0 | 1,2 | 1,5 | | 2,5 | | |
| **12,5 / 10 N/mm²** | | 2,0 | 2,5 | 2,0 | 4,0 | 2,0 | 2,5 | | 4,5 | | |
| **20 / 16 N/mm²** | | 3,0 | 3,5 | 3,0 | 6,0 | 3,0 | 3,5 | | 7,0 | | |
| **25 / 20 N/mm²** | | 4,0 | 4,5 | 4,0 | 7,5 | 4,0 | 4,5 | | 8,5 | | |
| **35 / 28 N/mm²** | | 5,0 | 6,5 | 5,0 | 9,5 | 5,0 | 6,5 | | 12,0 | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C31** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, 2DF,<br>Characteristic resistance under tension and shear loading | |

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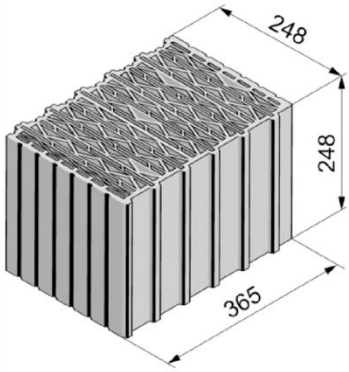
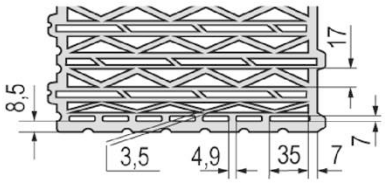
## Vertical perforated brick HLz, U8, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 248 | 365 | 248 |
| Mean gross dry density ρ | [kg/dm³] | 0,6 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 5 / 4 or 7,5 / 6 or 10 / 8 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B15

**Table C32.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | | **-** | |
| | | | | | | | **11x85** | | | | | | **15x85** | | | | | | | |
| **Selkent perforated sleeve H K** | | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | | **20x200** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | | | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 3 | 5 | 3 | 5 | 3 | 5 | 5 | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | | | | | | | |
| Spacing | $s_{min}$ ∥ | | 80 | | | | | | | | | | | | | | | | | |
| | $s_{cr}$ ∥ | | 250 | | | | | | | | | | | | | | | | | |
| | $s_{min}$ ⊥ | | 80 | | | | | | | | | | | | | | | | | |
| | $s_{cr}$ ⊥ | | 250 | | | | | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | | | | | |
| Rotary drilling with carbide drill | | | | | | | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C32.2:** Group factors

| **Anchor rod** | | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | | **-** | |
| | | | | | | | **11x85** | | | | | | **15x85** | | | | | | | |
| **Selkent perforated sleeve H K** | | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | | **20x200** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,3 | | | | | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | 1,2 | | | | | | | | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,3 | | | | | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,0 | | | | | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, U8, dimensions, installation parameters, Group factors

**Annex C32**

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## Vertical perforated brick HLz, U8, EN 771-1:2011+A1:2015

**Table C33.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 5 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | |
| Spacing | $s_{min}$ II | | 80 | | |
| | $s_{cr}$ II | | 250 | | |
| | $s_{min}$ ⊥ | | 80 | | |
| | $s_{cr}$ ⊥ | | 250 | | |
| **Drilling method** | | | | | |
| Rotary drilling with carbide drill | | | | | |

**Table C33.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,3 | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | 1,2 | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,3 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,0 | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, U8, dimensions, installation parameters, Group factors

**Annex C33**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, U8, EN 771-1:2011+A1:2015

**Table C34.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | M6 | M8 | M6 | M8 | - | M8 | M10 | M8 | M10 | - | M12 | M16 | M12 | M16 | M12 | M16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | M6 M8 | - | | - | | M10 M12 | - | | - | | - | |
| | | | | | 11x85 | | | | | 15x85 | | | | | | |
| **Selkent perforated sleeve H K** | 12x50 | | 12x85 | | 16x85 | | | 16x130 | | 20x85 | | | 20x130 | | 20x200 | |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
|---|---|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | |
| **5 / 4 N/mm²** | w/w | w/d | 1,2 | 1,2 |
| | d/d | | 1,2 | 1,5 |
| **7,5 / 6 N/mm²** | w/w | w/d | 1,5 | 1,5 |
| | d/d | | 1,5 | 1,5 |
| **10 / 8 N/mm²** | w/w | w/d | 1,5 | 2,0 |
| | d/d | | 2,0 | 2,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C34.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | |
|---|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | |
| **5 / 4 N/mm²** | w/w | w/d | 1,2 |
| | d/d | | 1,5 |
| **7,5 / 6 N/mm²** | w/w | w/d | 1,5 |
| | d/d | | 1,5 |
| **10 / 8 N/mm²** | w/w | w/d | 2,0 |
| | d/d | | 2,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C34** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, U8, Characteristic resistance under tension loading | |

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## Vertical perforated brick HLz, U8, EN 771-1:2011+A1:2015

**Table C35.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | M6 | M8 | M6 | M8 | - | M8 | M10 | M8 | M10 | - | M12 | M16 | M12 | M16 | M12 | M16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | M6 M8 | - | | - | | M10 M12 | - | | - | | - | |
| | | | | | 11x85 | | | | | 15x85 | | | | | | |
| **Selkent perforated sleeve H K** | 12x50 | | 12x85 | | 16x85 | | | 16x130 | | 20x85 | | | 20x130 | | 20x200 | |

| $V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C | | |
|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | |
| **5 / 4 N/mm²** | w/w w/d d/d | 1,2 |
| **7,5 / 6 N/mm²** | w/w w/d d/d | 1,5 |
| **10 / 8 N/mm²** | w/w w/d d/d | 1,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C35.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |

| $V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C | | |
|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | |
| **5 / 4 N/mm²** | w/w w/d d/d | 1,2 |
| **7,5 / 6 N/mm²** | w/w w/d d/d | 1,5 |
| **10 / 8 N/mm²** | w/w w/d d/d | 1,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C35** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, U8, Characteristic resistance under shear loading | |

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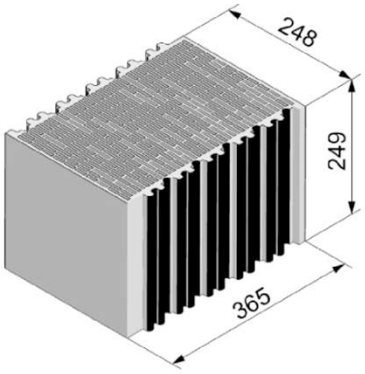
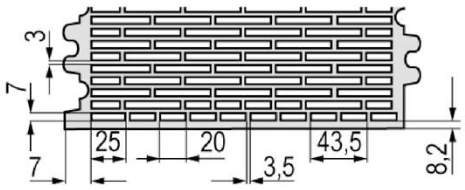
## Vertical perforated brick HLz, T10, T11, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 248 | 365 | 249 |
| Mean gross dry density ρ | [kg/dm³] | 0,7 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 10 / 8 or 12,5 / 10 or 15 / 12 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B16

**Table C36.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6 M8** **11x85** | **-** | | **-** | | **M10 M12** **15x85** | **-** | | **-** | | **-** | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 3 | | | 5 | 3 | 5 | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | | | |
| Spacing | $s_{min}$ II | | 80 | | | | | | | | | | | | | |
| | $s_{cr}$ II | | 250 | | | | | | | | | | | | | |
| | $s_{min}$ ⊥ | | 80 | | | | | | | | | | | | | |
| | $s_{cr}$ ⊥ | | 250 | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Rotary drilling with carbide drill | | | | | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C36.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6 M8** **11x85** | **-** | | **-** | | **M10 M12** **15x85** | **-** | | **-** | | **-** | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,7 | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | 0,5 | | | | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,3 | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 0,5 | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, T10, T11, dimensions, installation parameters, Group factors

**Annex C36**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, T10, T11, EN 771-1:2011+A1:2015

**Table C37.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 5 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | |
| Spacing | $s_{min}$ II | | 80 | | |
| | $s_{cr}$ II | | 250 | | |
| | $s_{min}$ ⊥ | | 80 | | |
| | $s_{cr}$ ⊥ | | 250 | | |
| **Drilling method** | | | | | |
| Rotary drilling with carbide drill | | | | | |

**Table C37.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,7 | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | 0,5 | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,3 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 0,5 | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, T10, T11, dimensions, installation parameters, Group factors

**Annex C37**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, T10, T11, EN 771-1:2011+A1:2015

**Table C38.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | | M6 M8 | M6 M8 | - | M8 M10 | M8 M10 | - | M12 M16 | M12 M16 | M12 M16 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | M6 M8<br>11x85 | - | - | M10 M12<br>15x85 | - | - | - |
| **Selkent perforated sleeve H K** | | 12x50 | 12x85 | 16x85 | | 16x130 | 20x85 | | 20x130 | 20x200 |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | |
| **10 / 8 N/mm²** | w/w w/d | 1,5 | 1,5 | | | | | | | |
| | d/d | 1,5 | 2,0 | | | | | | | |
| **12,5 / 10 N/mm²** | w/w w/d | 1,5 | 2,0 | | | | | | | |
| | d/d | 2,0 | 2,0 | | | | | | | |
| **15 / 12 N/mm²** | w/w w/d | 2,0 | 2,0 | | | | | | | |
| | d/d | 2,0 | 2,5 | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C38.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | |
| **10 / 8 N/mm²** | w/w w/d | 1,5 | | 1,5 |
| | d/d | 2,0 | | 2,0 |
| **12,5 / 10 N/mm²** | w/w w/d | 2,0 | | 2,0 |
| | d/d | 2,0 | | 2,0 |
| **15 / 12 N/mm²** | w/w w/d | 2,0 | | 2,0 |
| | d/d | 2,5 | | 2,5 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C38** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, T10, T11, Characteristic resistance under tension loading | |

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## Vertical perforated brick HLz, T10, T11, EN 771-1:2011+A1:2015

**Table C39.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** **M8** **11x85** | **-** | | **-** | | **M10** **M12** **15x85** | **-** | | **-** | | **-** | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | | | | | | | | | |
| **10 / 8 N/mm²** | w/w w/d d/d | | 0,9 | | 1,5 | | | 2,0 | | | | | | | | |
| **12,5 / 10 N/mm²** | w/w w/d d/d | | 0,9 | | 1,5 | | | 2,0 | | | | | | | | |
| **15 / 12 N/mm²** | w/w w/d d/d | | 1,2 | | 2,0 | | | 2,0 | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C39.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | |
| **10 / 8 N/mm²** | w/w w/d d/d | 1,5 | 2,0 |
| **12,5 / 10 N/mm²** | w/w w/d d/d | 1,5 | 2,0 |
| **15 / 12 N/mm²** | w/w w/d d/d | 2,0 | 2,0 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C39** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, T10, T11, Characteristic resistance under shear loading | |

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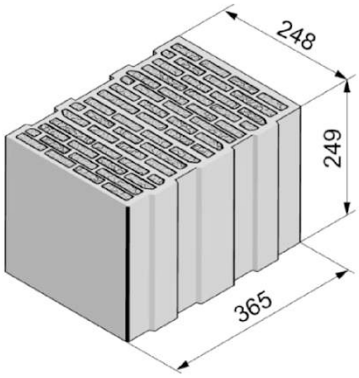
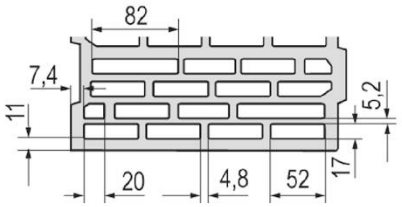
## Vertical perforated brick HLz, T7 PF, filled with perlit, EN 771-1:2011+A1:2015




| Producer | | e.g. Wienerberger | | |
|---|---|---|---|---|
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 248 | 365 | 249 |
| Mean gross dry density ρ | [kg/dm³] | 0,5 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 5 / 4 or 8 / 6 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B16

**Table C40.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | M6 | M8 | M6 | M8 | - | | M8 | M10 | M8 | M10 | - | | M12 | M16 | M12 | M16 | M12 | M16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | M6 | M8 | - | | - | | M10 | M12 | - | | - | | - | |
| | | | | | | | 11x85 | | | | | | 15x85 | | | | | | | |
| **Selkent perforated sleeve H K** | | | 12x50 | | 12x85 | | 16x85 | | | | 16x130 | | 20x85 | | | | 20x130 | | 20x200 | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | | | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 2 | | | | | | 5 | | 2 | | 5 | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | | | | | | | |
| Spacing | $s_{min}$ ∥ | | 80 | | | | | | | | | | | | | | | | | |
| | $s_{cr}$ ∥ | | 250 | | | | | | | | | | | | | | | | | |
| | $s_{min}$ ⊥ | | 80 | | | | | | | | | | | | | | | | | |
| | $s_{cr}$ ⊥ | | 250 | | | | | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | | | | | |
| Rotary drilling with carbide drill | | | | | | | | | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C40.2:** Group factors

| **Anchor rod** | | | M6 | M8 | M6 | M8 | - | | M8 | M10 | M8 | M10 | - | | M12 | M16 | M12 | M16 | M12 | M16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | M6 | M8 | - | | - | | M10 | M12 | - | | - | | - | |
| | | | | | | | 11x85 | | | | | | 15x85 | | | | | | | |
| **Selkent perforated sleeve H K** | | | 12x50 | | 12x85 | | 16x85 | | | | 16x130 | | 20x85 | | | | 20x130 | | 20x200 | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,1 | | | | | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | 1,2 | | | | | | | | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,1 | | | | | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,2 | | | | | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, T7 PF, filled with perlite, dimensions, installation parameters, Group factors

**Annex C40**

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## Vertical perforated brick HLz, T7 PF, filled with perlite, EN 771-1:2011+A1:2015

**Table C41.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 5 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | |
| Spacing | $s_{min}$ II | [mm] | 80 | | |
| | $s_{cr}$ II | [mm] | 250 | | |
| | $s_{min}$ ⊥ | [mm] | 80 | | |
| | $s_{cr}$ ⊥ | [mm] | 250 | | |
| **Drilling method** | | | | | |
| Rotary drilling with carbide drill | | | | | |

**Table C41.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,1 | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | [-] | 1,2 | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | [-] | 1,1 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | [-] | 1,2 | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, T7 PF, filled with perlite, dimensions, installation parameters, Group factors

**Annex C41**

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## Vertical perforated brick HLz, T7 PF, filled with perlite, EN 771-1:2011+A1:2015

**Table C42.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | M6 M8 | M6 M8 | - | M8 M10 | M8 M10 | - | M12 M16 | M12 M16 | M12 M16 |
|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | - | M6 M8 | - | - | M10 M12 | - | - | - |
| | | | 11x85 | | | 15x85 | | | |
| **Selkent perforated sleeve H K** | 12x50 | 12x85 | 16x85 | | 16x130 | 20x85 | | 20x130 | 20x200 |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C** [2] | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | |
| **5 / 4 N/mm²** | w/w | w/d | 1,2 | 1,2 | 1,2 | 1,2 | 2,0 |
| | d/d | | 1,5 | 1,5 | 1,5 | 1,5 | 2,0 |
| **8 / 6 N/mm²** | w/w | w/d | 1,5 | 1,5 | 1,5 | 1,5 | 2,5 |
| | d/d | | 1,5 | 2,0 | 1,5 | 2,0 | 3,0 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C42.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C** [2] | | | | |
|---|---|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | |
| **5 / 4 N/mm²** | w/w | w/d | 1,2 | 1,2 |
| | d/d | | 1,5 | 1,5 |
| **8 / 6 N/mm²** | w/w | w/d | 1,5 | 1,5 |
| | d/d | | 2,0 | 2,0 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C42** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, T7 PF, filled with perlite,<br>Characteristic resistance under tension loading | |

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## Vertical perforated brick HLz, T7 PF, filled with perlite, EN 771-1:2011+A1:2015

**Table C43.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | | **-** | |
| | | | | | **11x85** | | | | | | **15x85** | | | | | | | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | | **20x200** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | | | | | | | | | | | |
| **5 / 4 N/mm²** | w/w | w/d | 0,9 | | 1,5 | | | | | | 1,2 | | | | | | | |
| | d/d | | | | | | | | | | | | | | | | | |
| **8 / 6 N/mm²** | w/w | w/d | 1,2 | | 2,0 | | | | | | 1,5 | | | | | | | |
| | d/d | | | | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C43.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | |
| **5 / 4 N/mm²** | w/w w/d<br>d/d | 1,5 | 1,2 |
| **8 / 6 N/mm²** | w/w w/d<br>d/d | 2,0 | 1,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C43** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, T7 PF, filled with perlite,<br>Characteristic resistance under shear loading | |

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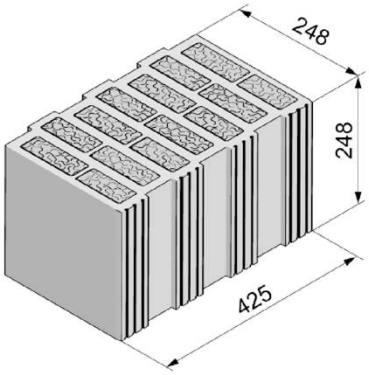
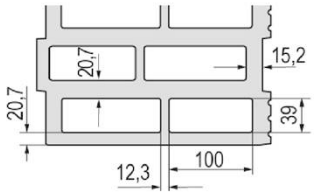
## Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 248 | 425 | 248 |
| Mean gross dry density ρ | [kg/dm³] | 0,8 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 5 / 4 or 8 / 6 or 10 / 8 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B16

**Table C44.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | **-** | | **-** | | **M6** **M8** **11x85** | **-** | | **-** | | **M10** **M12** **15x85** | **-** | | **-** | | **-** | |
| **Selkent perforated sleeve H K** | | | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 3 | | | | | 5 | | 3 | | 5 | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | | | | | |
| Spacing | $s_{min}$ II | | 80 | | | | | | | | | | | | | | | |
| | $s_{cr}$ II | | 250 | | | | | | | | | | | | | | | |
| | $s_{min}$ ⊥ | | 80 | | | | | | | | | | | | | | | |
| | $s_{cr}$ ⊥ | | 250 | | | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | | | |
| Rotary drilling with carbide drill | | | | | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C44.2:** Group factors

| **Anchor rod** | | | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | **-** | | **-** | | **M6** **M8** **11x85** | **-** | | **-** | | **M10** **M12** **15x85** | **-** | | **-** | | **-** | |
| **Selkent perforated sleeve H K** | | | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,3 | | | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | 1,2 | | | | | | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 0,6 | | | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,2 | | | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, T9 MW, filled with mineral wool, dimensions, installation parameters, Group factors

**Annex C44**

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## Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1:2011+A1:2015

**Table C45.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 5 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | |
| Spacing | $s_{min}$ ∥ | | 80 | | |
| | $s_{cr}$ ∥ | | 250 | | |
| | $s_{min}$ ⊥ | | 80 | | |
| | $s_{cr}$ ⊥ | | 250 | | |
| **Drilling method** | | | | | |
| Rotary drilling with carbide drill | | | | | |

**Table C45.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,3 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | 1,2 | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 0,6 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,2 | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, T9 MW, filled with mineral wool,
dimensions, installation parameters, Group factors

**Annex C45**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1:2011+A1:2015

**Table C46.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | M6 | M8 | M6 | M8 | - | M8 | M10 | M8 | M10 | - | M12 | M16 | M12 | M16 | M12 | M16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | M6 M8 | - | | - | | M10 M12 | - | | - | | - | |
| | | | | | 11x85 | | | | | 15x85 | | | | | | |
| **Selkent perforated sleeve H K** | 12x50 | | 12x85 | | 16x85 | | | 16x130 | | 20x85 | | | 20x130 | | 20x200 | |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | |
| **5 / 4 N/mm²** | w/w | w/d | 1,5 | 2,0 | 3,0 | 2,5 | 4,0 |
| | d/d | | 2,0 | 2,5 | 3,0 | 2,5 | 4,5 |
| **8 / 6 N/mm²** | w/w | w/d | 2,0 | 2,5 | 3,5 | 3,0 | 5,0 |
| | d/d | | 2,0 | 3,0 | 4,0 | 3,0 | 5,5 |
| **10 / 8 N/mm²** | w/w | w/d | 2,5 | 3,0 | 4,0 | 3,5 | 6,0 |
| | d/d | | 2,5 | 3,0 | 4,5 | 3,5 | 6,5 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C46.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
|---|---|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | |
| **5 / 4 N/mm²** | w/w | w/d | 3,0 | 4,0 |
| | d/d | | 3,0 | 4,5 |
| **8 / 6 N/mm²** | w/w | w/d | 3,5 | 5,0 |
| | d/d | | 4,0 | 5,5 |
| **10 / 8 N/mm²** | w/w | w/d | 4,0 | 6,0 |
| | d/d | | 4,5 | 6,5 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C46** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, T9 MW, filled with mineral wool;<br>Characteristic resistance under tension loading | |

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## Vertical perforated brick HLz, T9 MW, filled with mineral wool, EN 771-1:2011+A1:2015

**Table C47.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | M6 M8 | M6 M8 | - | M8 M10 | M8 M10 | - | M12 M16 | M12 M16 | M12 M16 |
|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | - | M6 M8 | - | - | M10 M12 | - | - | - |
| | | | 11x85 | | | 15x85 | | | |
| **Selkent perforated sleeve H K** | 12x50 | 12x85 | 16x85 | | 16x130 | 20x85 | | 20x130 | 20x200 |

**$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C**

| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **5 / 4 N/mm²** | w/w w/d<br>d/d | 2,0 | 2,0 | | 2,5 | 2,0 | | | 1,5 | |
| **8 / 6 N/mm²** | w/w w/d<br>d/d | 2,5 | 2,5 | | 3,0 | 2,5 | | | 2,0 | |
| **10 / 8 N/mm²** | w/w w/d<br>d/d | 2,5 | 3,0 | | 4,0 | 3,0 | | | 2,5 | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C47.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |

**$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C**

| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | |
|---|---|---|---|---|
| **5 / 4 N/mm²** | w/w w/d<br>d/d | 2,5 | | 2,0 |
| **8 / 6 N/mm²** | w/w w/d<br>d/d | 3,0 | | 2,5 |
| **10 / 8 N/mm²** | w/w w/d<br>d/d | 4,0 | | 3,0 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C47** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, T9 MW, filled with mineral wool;<br>Characteristic resistance under shear loading | |

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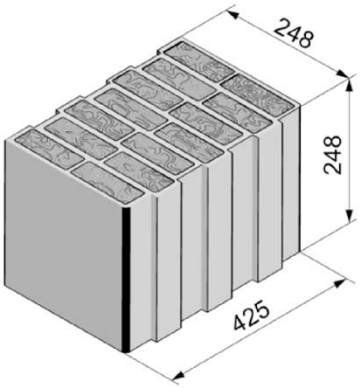
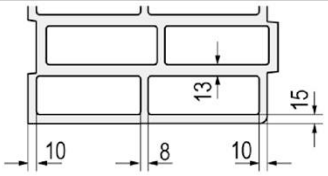
## Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 248 | 425 | 248 |
| Mean gross dry density ρ | [kg/dm³] | 0,8 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 5 / 4 or 7,5 / 6 or 10 / 8 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B16

**Table C48.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6** **M8** **11x85** | - | | - | | **M10** **M12** **15x85** | - | | - | | - | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 2 | | | | 5 | 2 | | 5 | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | | | |
| Spacing | $s_{min}$ ∥ | | 80 | | | | | | | | | | | | | |
| | $s_{cr}$ ∥ | | 250 | | | | | | | | | | | | | |
| | $s_{min}$ ⊥ | | 80 | | | | | | | | | | | | | |
| | $s_{cr}$ ⊥ | | 250 | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Rotary drilling with carbide drill | | | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C48.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6** **M8** **11x85** | - | | - | | **M10** **M12** **15x85** | - | | - | | - | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,9 | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | 0,9 | | | | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,0 | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 0,7 | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, FZ 7, filled with mineral wool;
dimensions, installation parameters, Group factors

**Annex C48**

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## Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1:2011+A1:2015

**Table C49.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $T_{inst}$ | [Nm] | 5 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | |
| Spacing | $s_{min}$ II | [mm] | 80 | | |
| | $s_{cr}$ II | [mm] | 250 | | |
| | $s_{min}$ ⊥ | [mm] | 80 | | |
| | $s_{cr}$ ⊥ | [mm] | 250 | | |
| **Drilling method** | | | | | |
| Rotary drilling with carbide drill | | | | | |

**Table C49.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,9 | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | [-] | 0,9 | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | [-] | 1,0 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | [-] | 0,7 | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, FZ 7, filled with mineral wool;
dimensions, installation parameters, Group factors

**Annex C49**

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## Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1:2011+A1:2015

**Table C50.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | | M6 | M8 | M6 | M8 | - | M8 | M10 | M8 | M10 | - | M12 | M16 | M12 | M16 | M12 | M16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | | M6 M8 | - | | - | | M10 M12 | - | | - | | - | |
| | | | | | | 11x85 | | | | | 15x85 | | | | | | |
| **Selkent perforated sleeve H K** | | 12x50 | | 12x85 | | 16x85 | | | 16x130 | | 20x85 | | | 20x130 | | 20x200 | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | | | | | | | |
| **5 / 4 N/mm²** | w/w w/d | 0,60 | | 0,75 | | 1,50 | | | 2,00 | | 1,20 | | | 2,00 | | 2,00 | |
| | d/d | 0,60 | | 0,90 | | 1,50 | | | 2,00 | | 1,50 | | | 2,00 | | 2,50 | |
| **7,5 / 6 N/mm²** | w/w w/d | 0,75 | | 0,90 | | 1,50 | | | 2,00 | | 1,50 | | | 2,50 | | 2,50 | |
| | d/d | 0,90 | | 0,90 | | 2,00 | | | 2,50 | | 2,00 | | | 2,50 | | 3,00 | |
| **10 / 8 N/mm²** | w/w w/d | 0,90 | | 1,20 | | 2,00 | | | 2,50 | | 2,00 | | | 2,50 | | 3,00 | |
| | d/d | 0,90 | | 1,20 | | 2,00 | | | 3,00 | | 2,00 | | | 3,00 | | 3,50 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C50.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | |
| **5 / 4 N/mm²** | w/w w/d | 2,0 | | 2,0 |
| | d/d | 2,0 | | 2,0 |
| **7,5 / 6 N/mm²** | w/w w/d | 2,0 | | 2,5 |
| | d/d | 2,5 | | 2,5 |
| **10 / 8 N/mm²** | w/w w/d | 2,5 | | 2,5 |
| | d/d | 3,0 | | 3,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C50** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, FZ 7, filled with mineral wool;<br>Characteristic resistance under tension loading | |

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## Vertical perforated brick HLz, FZ 7, filled with mineral wool, EN 771-1:2011+A1:2015

**Table C51.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6 M8** **11x85** | **-** | | **-** | | **M10 M12** **15x85** | **-** | | **-** | | **-** | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | | | | | | | | | |
| **5 / 4 N/mm²** | w/w w/d d/d | | 1,2 | | 1,5 | | | | | | | | | | 1,5 | |
| **7,5 / 6 N/mm²** | w/w w/d d/d | | 1,5 | | 2,0 | | | | | | | | | | 1,5 | |
| **10 / 8 N/mm²** | w/w w/d d/d | | 1,5 | | 2,5 | | | | | | | | | | 2,0 | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C51.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | |
| **5 / 4 N/mm²** | w/w w/d d/d | 1,5 | |
| **7,5 / 6 N/mm²** | w/w w/d d/d | 2,0 | |
| **10 / 8 N/mm²** | w/w w/d d/d | 2,5 | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C51** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, FZ 7, filled with mineral wool;<br>Characteristic resistance under shear loading | |

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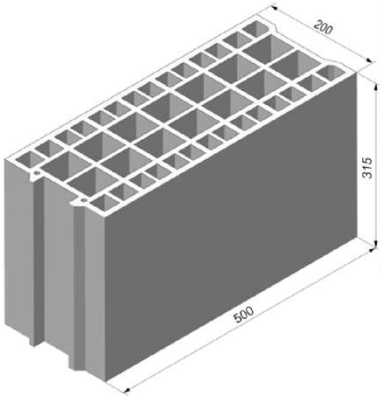
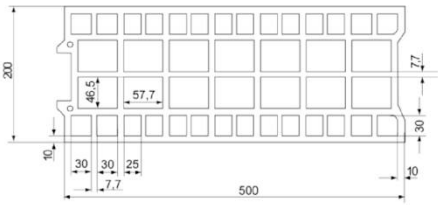
## Vertical perforated brick HLz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Bouyer Leroux | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 500 | 200 | 315 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 0,6 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 5 / 4 or 7,5 / 6 or 10 / 8 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B16

**Table C52.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | **M10** **M12** **15x85** | | - | | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 120 | | | | | | | | | | | |
| Spacing | $s_{min}$ ∥ | | 120 | | | | | | | | | | | |
| | $s_{cr}$ ∥ | | 500 | | | | | | | | | | | |
| | $s_{min} \perp = s_{cr} \perp$ | | 315 | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C52.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | **M10** **M12** **15x85** | | - | | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| Group factors $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,3 | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min}$ ∥) | | 1,7 | | | | | | | | | | | | |
| Group factors $\alpha_{g,N}$ ($s_{min} \perp$) | | 2,0 | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min} \perp$) | | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C52**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C53.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 2 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 120 | | |
| Spacing | $s_{min}$ II | [mm] | 120 | | |
| | $s_{cr}$ II | [mm] | 500 | | |
| | $s_{min} \perp = s_{cr} \perp$ | [mm] | 315 | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C53.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,3 | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | [-] | 1,7 | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | 2,0 | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C53**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C54.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | | | | | | | |
| **5 / 4 N/mm²** | w/w w/d | 0,50 | | 1,50 | | | | | | 0,75 | | 1,50 | | | | 1,50 | |
| | d/d | 0,60 | | 1,50 | | | | | | 0,90 | | 1,50 | | | | 2,00 | |
| **7,5 / 6 N/mm²** | w/w w/d | 0,75 | | 2,00 | | | | | | 1,20 | | 2,00 | | | | 2,50 | |
| | d/d | 0,90 | | 2,50 | | | | | | 1,20 | | 2,50 | | | | 2,50 | |
| **10 / 8 N/mm²** | w/w w/d | 0,90 | | 3,00 | | | | | | 1,50 | | 3,00 | | | | 3,50 | |
| | d/d | 1,20 | | 3,00 | | | | | | 2,00 | | 3,00 | | | | 3,50 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C54.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | |
| **5 / 4 N/mm²** | w/w w/d | 0,75 | | 1,50 |
| | d/d | 0,90 | | 2,00 |
| **7,5 / 6 N/mm²** | w/w w/d | 1,20 | | 2,50 |
| | d/d | 1,20 | | 2,50 |
| **10 / 8 N/mm²** | w/w w/d | 1,50 | | 3,50 |
| | d/d | 2,00 | | 3,50 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C54** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under tension loading | |

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## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C55.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** **M8** **11x85** | **-** | | **-** | | **M10** **M12** **15x85** | **-** | | **-** | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | | | | | | | |
| **5 / 4 N/mm²** | w/w | w/d | 1,5 | | | | | 0,9 | | 1,5 | | 2,5 | | 0,9 |
| | d/d | | | | | | | | | | | | | |
| **7,5 / 6 N/mm²** | w/w | w/d | 2,5 | | | | | 1,5 | | 2,5 | | 3,5 | | 1,5 |
| | d/d | | | | | | | | | | | | | |
| **10 / 8 N/mm²** | w/w | w/d | 3,5 | | | | | 2,0 | | 3,5 | | 4,5 | | 2,0 |
| | d/d | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C55.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | |
| **5 / 4 N/mm²** | w/w w/d<br>d/d | 0,9 | |
| **7,5 / 6 N/mm²** | w/w w/d<br>d/d | 1,5 | |
| **10 / 8 N/mm²** | w/w w/d<br>d/d | 2,0 | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C55** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under shear loading | |

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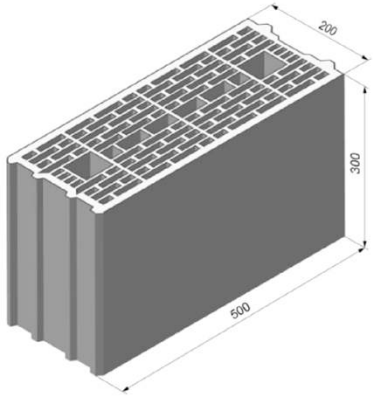
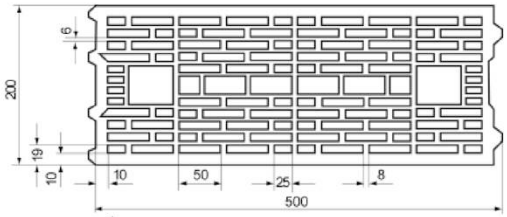
## Vertical perforated brick HLz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 500 | 200 | 300 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 0,7 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 5 / 4 or 7,5 / 6 or 10 / 8 12,5 / 10 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B17

**Table C56.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6 M8** **11x85** | - | | - | | **M10 M12** **15x85** | - | | - | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 50 | | | | | 80 | | | 50 | | 80 | |
| Spacing | $s_{min}$ ∥ | [mm] | 100 | | | | | | | | | | | |
| | $s_{cr}$ ∥ | [mm] | 500 | | | | | | | | | | | |
| | $s_{min} \perp = s_{cr} \perp$ | [mm] | 300 | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C56.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6 M8** **11x85** | - | | - | | **M10 M12** **15x85** | - | | - | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| Group factors $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,4 | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min}$ ∥) | [-] | 2 | | | | | | | | | | | | |
| Group factors $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | 2 | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | 2 | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C56**

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## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C57.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 80 | | |
| Spacing | $s_{min}$ II | [mm] | 100 | | |
| | $s_{cr}$ II | [mm] | 500 | | |
| | $s_{min} \perp = s_{cr} \perp$ | [mm] | 300 | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C57.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,4 | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | [-] | 2 | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C57**

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## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C58.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** / **11x85** | **M8** / **11x85** | **-** | | **-** | **M10** / **15x85** | **M12** / **15x85** | **-** | **-** | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | | | | | |
| **5 / 4 N/mm²** | w/w \| w/d | 0,50 | | | | 0,60 | | | 1,20 | | 0,75 | | | 1,50 | |
| | d/d | 0,60 | | | | 0,75 | | | 1,20 | | 0,90 | | | 1,50 | |
| **7,5 / 6 N/mm²** | w/w \| w/d | 0,75 | | | | 0,90 | | | 1,50 | | 1,20 | | | 2,00 | |
| | d/d | 0,90 | | | | 1,20 | | | 2,00 | | 1,20 | | | 2,50 | |
| **10 / 8 N/mm²** | w/w \| w/d | 0,90 | | | | 1,20 | | | 2,00 | | 1,50 | | | 2,50 | |
| | d/d | 1,20 | | | | 1,50 | | | 2,50 | | 1,50 | | | 3,00 | |
| **12,5 / 10 N/mm²** | w/w \| w/d | 1,20 | | | | 1,50 | | | 2,50 | | 2,00 | | | 3,50 | |
| | d/d | 1,50 | | | | 2,00 | | | 3,00 | | 2,00 | | | 4,00 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C58.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | |
| **5 / 4 N/mm²** | w/w \| w/d | 1,2 | | 1,5 |
| | d/d | 1,2 | | 1,5 |
| **7,5 / 6 N/mm²** | w/w \| w/d | 1,5 | | 2,0 |
| | d/d | 2,0 | | 2,5 |
| **10 / 8 N/mm²** | w/w \| w/d | 2,0 | | 2,5 |
| | d/d | 2,5 | | 3,0 |
| **12,5 / 10 N/mm²** | w/w \| w/d | 2,5 | | 3,5 |
| | d/d | 3,0 | | 4,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C58** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under tension loading | |

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## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C59.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | | | | | | | | | | |
| **5 / 4 N/mm²** | w/w w/d d/d | 0,9 | | 1,2 | | 0,9 | | 1,2 | | 0,6 | | 2,0 | | | | 0,6 | |
| **7,5 / 6 N/mm²** | w/w w/d d/d | 1,2 | | 1,5 | | 1,2 | | 1,5 | | 0,9 | | 3,0 | | | | 0,9 | |
| **10 / 8 N/mm²** | w/w w/d d/d | 1,5 | | 2,0 | | 1,5 | | 2,0 | | 1,2 | | 4,0 | | | | 1,2 | |
| **12,5 / 10 N/mm²** | w/w w/d d/d | 2,0 | | 3,0 | | 2,0 | | 3,0 | | 1,5 | | 5,0 | | | | 1,5 | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C59.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | |
| **5 / 4 N/mm²** | w/w w/d d/d | 0,6 | | |
| **7,5 / 6 N/mm²** | w/w w/d d/d | 0,9 | | |
| **10 / 8 N/mm²** | w/w w/d d/d | 1,2 | | |
| **12,5 / 10 N/mm²** | w/w w/d d/d | 1,5 | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C59** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under shear loading | |

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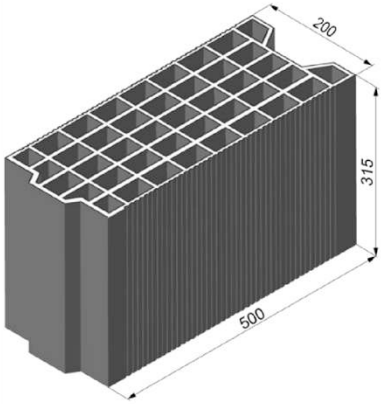
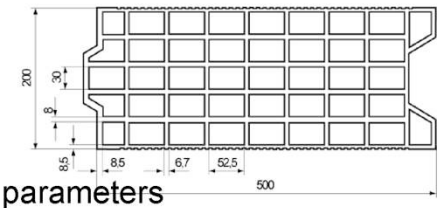
## Vertical perforated brick HLz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Terreal | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 500 | 200 | 315 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 0,7 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 2,5 / 2 or 5 / 4 or 7,5 / 6 or 10 / 8 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B17

**Table C60.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | **M10** **M12** **15x85** | | - | | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 50 | | | | | 80 | | 50 | | | 80 | |
| Spacing | $s_{min}$ II | | 100 | | | | | | | | | | | |
| | $s_{cr}$ II | | 500 | | | | | | | | | | | |
| | $s_{min}$ ⊥ | | 100 | | | | | | | | | | | |
| | $s_{cr}$ ⊥ | | 315 | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C60.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | **M10** **M12** **15x85** | | - | | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| Group factors $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,1 | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min}$ II) | | 1,2 | | | | | | | | | | | | |
| Group factors $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,1 | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,2 | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C60**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C61.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 2 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 80 | | |
| Spacing | $s_{min}$ ∥ | | 100 | | |
| | $s_{cr}$ ∥ | | 500 | | |
| | $s_{min}$ ⊥ | | 100 | | |
| | $s_{cr}$ ⊥ | | 315 | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C61.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,1 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | 1,2 | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,1 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,2 | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C61**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C62.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6 M8** | **-** | | **-** | | **M10 M12** | **-** | | **-** | |
| | | | | | | **11x85** | | | | | **15x85** | | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | | | | | |
| **2,5 / 2 N/mm²** | w/w w/d | 0,5 | | | | | | | | | | | | | |
| | d/d | 0,5 | | | | | | | 0,6 | | 0,5 | | | 0,6 | |
| **5 / 4 N/mm²** | w/w w/d | 0,9 | | | | | | | | | | | | | |
| | d/d | 0,9 | | 1,2 | | | | | | | | | | | |
| **7,5 / 6 N/mm²** | w/w w/d | 1,5 | | | | | | | | | | | | | |
| | d/d | 1,5 | | | | | | | | | | | | | |
| **10 / 8 N/mm²** | w/w w/d | 2,0 | | | | | | | | | | | | | |
| | d/d | 2,0 | | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0,83 \cdot N_{Rk\ (50/80°C)}$.

**Table C62.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | |
| **2,5 / 2 N/mm²** | w/w w/d | 0,5 | | |
| | d/d | 0,6 | | |
| **5 / 4 N/mm²** | w/w w/d | 0,9 | | |
| | d/d | 1,2 | | |
| **7,5 / 6 N/mm²** | w/w w/d | 1,5 | | |
| | d/d | 1,5 | | |
| **10 / 8 N/mm²** | w/w w/d | 2,0 | | |
| | d/d | 2,0 | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0,83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C62** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under tension loading | |

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C63.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | | | | | | | | | | |
| **2,5 / 2 N/mm²** | w/w w/d d/d | 0,30 | | 0,60 | | 0,3 | | 0,60 | | 0,60 | | 0,90 | | | | 0,75 | |
| **5 / 4 N/mm²** | w/w w/d d/d | 0,75 | | 1,20 | | 0,7 | | 1,20 | | 1,20 | | 2,00 | | | | 1,50 | |
| **7,5 / 6 N/mm²** | w/w w/d d/d | 0,90 | | 2,00 | | 0,9 | | 2,00 | | 1,50 | | 3,00 | | | | 2,00 | |
| **10 / 8 N/mm²** | w/w w/d d/d | 1,50 | | 2,50 | | 1,5 | | 2,50 | | 2,00 | | 4,00 | | | | 3,00 | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C63.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | |
| **2,5 / 2 N/mm²** | w/w w/d d/d | 0,60 | | 0,75 |
| **5 / 4 N/mm²** | w/w w/d d/d | 1,20 | | 1,50 |
| **7,5 / 6 N/mm²** | w/w w/d d/d | 1,50 | | 2,00 |
| **10 / 8 N/mm²** | w/w w/d d/d | 2,00 | | 3,00 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C63** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under shear loading | |

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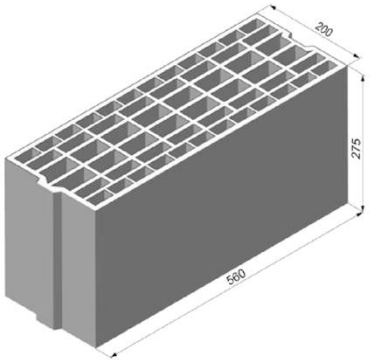
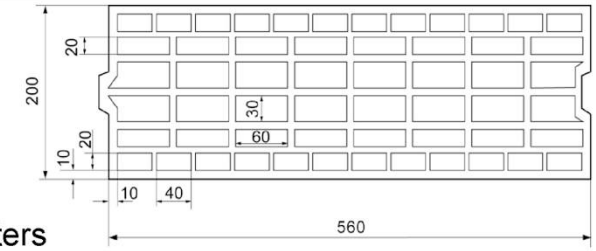
## Vertical perforated brick HLz, EN 771-1:2011+A1:2015




| Producer | | e.g. Imery | | |
|---|---|---|---|---|
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 560 | 200 | 275 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 0,7 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 5 / 4 or 8 / 6 or 10 / 8 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B17

### Table C64.1: Installation parameters

| **Anchor rod** | | | **M8** | **M10** | **M10** | **M12** | **M12** | **M16** | **M16** |
|---|---|---|---|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **16x130** | | **18x130/200** | | **20x130** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | | | | | |
| **General installation parameters** | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 80 | | | | | | |
| Spacing | $s_{min}$ II = $s_{cr}$ II | | 560 | | | | | | |
| | $s_{min} \perp = s_{cr} \perp$ | | 275 | | | | | | |
| **Drilling method** | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C64.2: Group factors

| **Anchor rod** | | | **M8** | **M10** | **M10** | **M12** | **M12** | **M16** | **M16** |
|---|---|---|---|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **16x130** | | **18x130/200** | | **20x130** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 2 | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C64**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C65.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M8** | **M10** | **M10** | **M12** | **M12** | **M16** | **M16** |
|---|---|---|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **16x130** | | **18x130/200** | | **20x130** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | |
| **5 / 4 N/mm²** | w/w w/d | 0,9 | | | | 1,2 | | |
| | d/d | 1,2 | | | | 1,5 | | |
| **8 / 6 N/mm²** | w/w w/d | 1,5 | | | | 2,0 | | |
| | d/d | 1,5 | | | | 2,0 | | |
| **10 / 8 N/mm²** | w/w w/d | 2,0 | | | | 2,5 | | |
| | d/d | 2,5 | | | | 3,0 | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C65.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M8** | **M10** | **M10** | **M12** | **M12** | **M16** | **M16** |
|---|---|---|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **16x130** | | **18x130/200** | | **20x130** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | |
| **5 / 4 N/mm²** | w/w w/d | 0,9 | | | | | | |
| | d/d | | | | | | | |
| **8 / 6 N/mm²** | w/w w/d | 1,5 | | | | | | |
| | d/d | | | | | | | |
| **10 / 8 N/mm²** | w/w w/d | 2,0 | | | | | | |
| | d/d | | | | | | | |

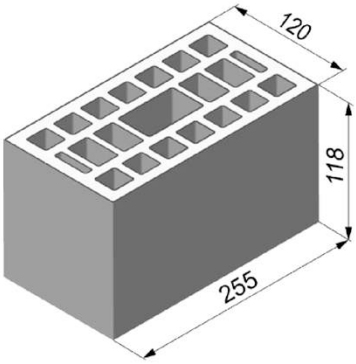
[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

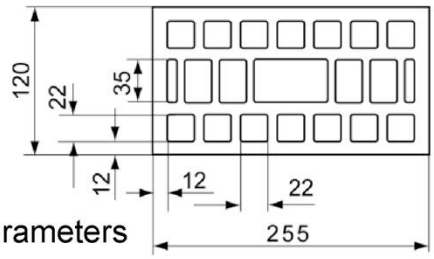
| Injection system Selkent SEL-V+ for masonry | **Annex C65** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under tension and shear loading | |

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | | e.g. Wienerberger | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 255 | 120 | 118 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,0 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 2,5 / 2 or 5 / 4 or 8 / 6 or 10 / 8 or 12,5 / 10 or 15 / 12 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B18

### Table C66.1: Installation parameters

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **-** | | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** | **M8** | **-** | | **M10** | **M12** | **-** | |
| | | | | | **11x85** | | | | **15x85** | | | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | | **20x85** | | | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | |
| Max. installation torque $\max T_{inst}$ | [Nm] | 2 | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | |
| Edge distance $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | |
| Spacing $s_{cr}$ II = $s_{min}$ II | [mm] | 255 | | | | | | | | | | |
| Spacing $s_{cr} \perp = s_{min} \perp$ | [mm] | 120 | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C66.2: Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **-** | | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** | **M8** | **-** | | **M10** | **M12** | **-** | |
| | | | | | **11x85** | | | | **15x85** | | | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | | **20x85** | | | |
| Group factors $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 2 | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min}$ II) | [-] | 2 | | | | | | | | | | |
| Group factors $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | 2 | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | 2 | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C66**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C67.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **-** | | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **M10** | **M12** | **-** | |
| | | | | | | **11x85** | | | | **15x85** | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **20x85** | | | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [1)]** | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [2)] | Use conditions | | | | | | | | | | | | |
| **2,5 / 2 N/mm²** | w/w w/d | 0,4 | | 0,5 | | | | | | -[3)] | | | |
| | d/d | 0,5 | | 0,5 | | | | | | -[3)] | | | |
| **5 / 4 N/mm²** | w/w w/d | 0,9 | | 0,9 | | | | | | 0,5 | | | |
| | d/d | 0,9 | | 1,2 | | | | | | 0,5 | | | |
| **8 / 6 N/mm²** | w/w w/d | 1,2 | | 1,5 | | | | | | 0,75 | | | |
| | d/d | 1,5 | | 1,5 | | | | | | 0,75 | | | |
| **10 / 8 N/mm²** | w/w w/d | 1,5 | | 2,0 | | | | | | 0,9 | | | |
| | d/d | 2,0 | | 2,0 | | | | | | 0,9 | | | |
| **12,5 / 10 N/mm²** | w/w w/d | 2,0 | | 2,5 | | | | | | 1,2 | | | |
| | d/d | 2,5 | | 2,5 | | | | | | 1,2 | | | |
| **15 / 12 N/mm²** | w/w w/d | 2,5 | | 3,0 | | | | | | 1,5 | | | |
| | d/d | 3,0 | | 3,5 | | | | | | 1,5 | | | |

[1)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

[2)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

[3)] No performance assessed.

Factor for job site tests and displacements see annex C123.

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, Characteristic resistance under tension loading

**Annex C67**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C68.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **-** | | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **M10** | **M12** | **-** | |
| | | | | | | **11x85** | | | | **15x85** | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **20x85** | | | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use condition | | | | | | | | | | | | |
| **2,5 / 2 N/mm²** | w/w w/d d/d | 0,60 | 0,75 | 0,60 | 0,75 | 0,90 | | | | | | | |
| **5 / 4 N/mm²** | w/w w/d d/d | 1,20 | 1,50 | 1,20 | 1,50 | 2,00 | | | | | | | |
| **8 / 6 N/mm²** | w/w w/d d/d | 2,00 | 2,00 | 2,00 | 2,00 | 2,50 | | | | | | | |
| **10 / 8 N/mm²** | w/w w/d d/d | 2,50 | 3,00 | 2,50 | 3,00 | 3,50 | | | | | | | |
| **12,5 / 10 N/mm²** | w/w w/d d/d | 3,00 | 3,50 | 3,00 | 3,50 | 4,50 | | | | | | | |
| **15 / 12 N/mm²** | w/w w/d d/d | 4,00 | 4,50 | 4,00 | 4,50 | 5,50 | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

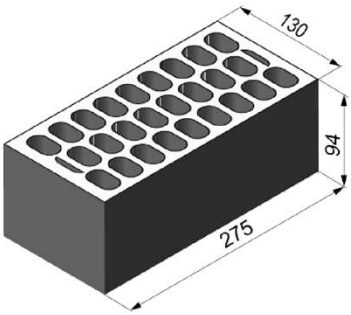
Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, Characteristic resistance under shear loading

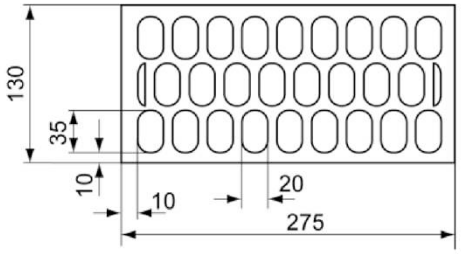
**Annex C68**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Cermanica Farreny S.A. | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 275 | 130 | 94 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 0,8 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 7,5 / 6 or 10 / 8 or 15 / 12 or 20 / 16 or 25 / 20 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B18

### Table C69.1: Installation parameters

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **-** | | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **M10** | **M12** | **-** | |
| | | | | | | **11x85** | | | | **15x85** | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **20x85** | | | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | |
| Max. installation torque | max $T_{inst}$ [Nm] | 2 | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ [mm] | 100 | | | | | | | | 120 | | | |
| Spacing | $s_{cr}$ II = $s_{min}$ II [mm] | 275 | | | | | | | | | | | |
| | $s_{cr}$ ⊥ = $s_{min}$ ⊥ [mm] | 95 | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C69.2: Group factors

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **-** | | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **M10** | **M12** | **-** | |
| | | | | | | **11x85** | | | | **15x85** | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **20x85** | | | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) [-] | 2 | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C69**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C70.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** / **11x85** | **M8** / **11x85** | **-** | **M10** / **15x85** | **M12** / **15x85** | **-** |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | **20x85** | | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | |
| **7,5 / 6 N/mm²** | w/w w/d | 0,40 | | 0,90 | | | | | | | |
| | d/d | 0,40 | | 0,90 | | | | | | | |
| **10 / 8 N/mm²** | w/w w/d | 0,50 | | 1,20 | | | | | | | |
| | d/d | 0,60 | | 1,20 | | | | | | | |
| **15 / 12 N/mm²** | w/w w/d | 0,75 | | 1,50 | | | | | | | |
| | d/d | 0,90 | | 2,00 | | | | | | | |
| **20 / 16 N/mm²** | w/w w/d | 0,90 | | 2,00 | | | | | | | |
| | d/d | 1,20 | | 2,50 | | | | | | | |
| **25 / 20 N/mm²** | w/w w/d | 1,20 | | 3,00 | | | | | | | |
| | d/d | 1,50 | | 3,00 | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, Characteristic resistance under tension loading

**Annex C70**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C71.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** / **11x85** | **M8** / **11x85** | **-** | **M10** / **15x85** | **M12** / **15x85** | **-** |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | **20x85** | | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | | | | |
| **7,5 / 6 N/mm²** | w/w, w/d, d/d | 1,2 | | 1,2 | | | | | | | |
| **10 / 8 N/mm²** | w/w, w/d, d/d | 1,5 | | 1,5 | | | | | | | |
| **15 / 12 N/mm²** | w/w, w/d, d/d | 2,0 | | 2,5 | | | | | | | |
| **20 / 16 N/mm²** | w/w, w/d, d/d | 3,0 | | 3,0 | | | | | | | |
| **25 / 20 N/mm²** | w/w, w/d, d/d | 4,0 | | 4,0 | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C71** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under tension loading | |

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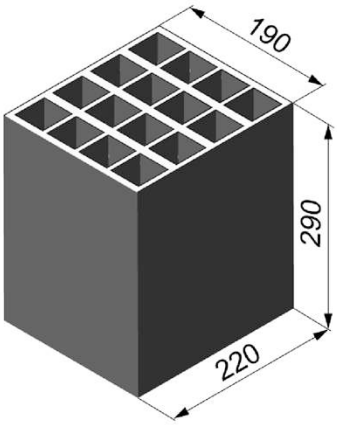
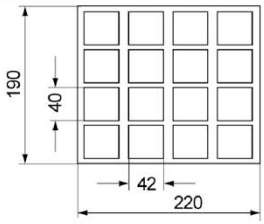
## Vertical perforated brick HLz, EN 771-1:2011+A1:2015




| Producer | | e.g. Perceram | | |
|---|---|---|---|---|
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 220 | 190 | 290 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 0,7 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 7,5 / 6 or 10 / 8 or 12,5 / 10 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B18

**Table C72.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | **M10** **M12** **15x85** | | - | | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 110 | | | | | | | | | | | |
| Spacing | $s_{min} \parallel = s_{cr} \parallel$ | [mm] | 220 | | | | | | | | | | | |
| | $s_{min} \perp = s_{cr} \perp$ | [mm] | 290 | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C72.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | **M10** **M12** **15x85** | | - | | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| Group factors $\alpha_{g,N}$ ($s_{min} \parallel$) | [-] | 2 | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min} \parallel$) | [-] | 2 | | | | | | | | | | | | |
| Group factors $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | 2 | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | 2 | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C72**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C73.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 110 | | |
| Spacing | $s_{min} \parallel = s_{cr} \parallel$ | | 220 | | |
| | $s_{min} \perp = s_{cr} \perp$ | | 290 | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C73.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min} \parallel$) | [-] | 2 | | |
| | $\alpha_{g,V}$ ($s_{min} \parallel$) | | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C73**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C74.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** **M8** **11x85** | **-** | | **-** | | **M10** **M12** **15x85** | **-** | | **-** | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | | | | | |
| **7,5 / 6 N/mm²** | w/w w/d | 0,3 | | 1,2 | | 1,2 | | | 1,5 | | 1,2 | | | 1,5 | |
| | d/d | 0,4 | | 1,5 | | 1,5 | | | 1,5 | | 1,5 | | | 1,5 | |
| **10 / 8 N/mm²** | w/w w/d | 0,5 | | 1,5 | | 1,5 | | | 2,0 | | 1,5 | | | 2,0 | |
| | d/d | 0,5 | | 2,0 | | 2,0 | | | 2,5 | | 2,0 | | | 2,5 | |
| **12,5 / 10 N/mm²** | w/w w/d | 0,6 | | 2,0 | | 2,0 | | | 2,5 | | 2,0 | | | 2,5 | |
| | d/d | 0,6 | | 2,5 | | 2,5 | | | 3,0 | | 2,5 | | | 3,0 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C74.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | |
| **7,5 / 6 N/mm²** | w/w w/d | 1,5 | | |
| | d/d | 1,5 | | |
| **10 / 8 N/mm²** | w/w w/d | 2,0 | | |
| | d/d | 2,5 | | |
| **12,5 / 10 N/mm²** | w/w w/d | 2,5 | | |
| | d/d | 3,0 | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C74** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under tension loading | |

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C75.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** / **M8** **11x85** | **-** | | **-** | | **M10** / **M12** **15x85** | **-** | | **-** | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | | | | | | | |
| **7,5 / 6 N/mm²** | w/w, w/d, d/d | | 1,5 | | 1,5 | | 1,5 | | 2,5 | 1,5 | | | 2,0 | |
| **10 / 8 N/mm²** | w/w, w/d, d/d | | 2,0 | | 2,0 | | 2,0 | | 3,5 | 2,0 | | | 3,0 | |
| **12,5 / 10 N/mm²** | w/w, w/d, d/d | | 2,5 | | 3,0 | | 3,0 | | 4,5 | 3,0 | | | 3,5 | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C75.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | |
| **7,5 / 6 N/mm²** | w/w, w/d, d/d | 2,0 | |
| **10 / 8 N/mm²** | w/w, w/d, d/d | 3,0 | |
| **12,5 / 10 N/mm²** | w/w, w/d, d/d | 3,5 | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C75** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under shear loading | |

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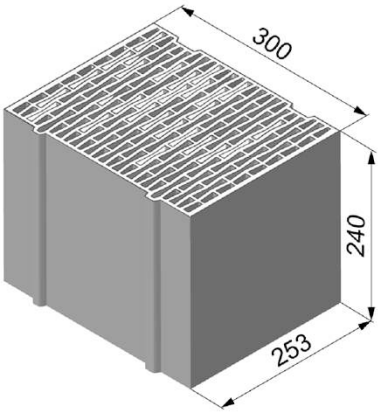
## Vertical perforated brick HLz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Ziegelwerk Brenna | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 253 | 300 | 240 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 0,8 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 2,5 / 2 or 5 / 4 or 8 / 6 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |

Dimension see also Annex B18

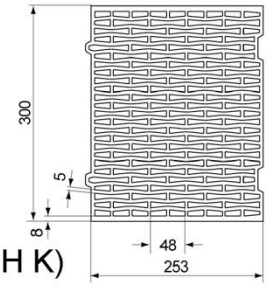



**Table C76.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6 M8** **11x85** | - | | - | | **M10 M12** **15x85** | - | | - | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | |
| Spacing | $s_{min} \parallel = s_{cr} \parallel$ | [mm] | 255 | | | | | | | | | | | |
| | $s_{min} \perp = s_{cr} \perp$ | [mm] | 240 | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C76.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6 M8** **11x85** | - | | - | | **M10 M12** **15x85** | - | | - | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| Group factors $\alpha_{g,N}$ ($s_{min} \parallel$) | [-] | 2 | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min} \parallel$) | [-] | 2 | | | | | | | | | | | | |
| Group factors $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | 2 | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | 2 | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C76**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C77.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $T_{inst}$ | [Nm] | 2 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | |
| Spacing | $s_{min}$ II = $s_{cr}$ II | [mm] | 255 | | |
| | $s_{min} \perp = s_{cr} \perp$ | [mm] | 240 | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C77.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 2 | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | [-] | 2 | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | 2 | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | 2 | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C77**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C78.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | | | | | | | |
| **2,5 / 2 N/mm²** | w/w w/d | -[3)] | | 0,50 | | 0,50 | | | | 0,40 | | 0,50 | | | | 0,40 | |
| | d/d | 0,30 | | 0,50 | | 0,50 | | | | 0,50 | | 0,50 | | | | 0,50 | |
| **5 / 4 N/mm²** | w/w w/d | 0,50 | | 0,90 | | 0,90 | | | | 0,90 | | 0,90 | | | | 0,90 | |
| | d/d | 0,60 | | 0,90 | | 0,90 | | | | 0,90 | | 0,90 | | | | 0,90 | |
| **8 / 6 N/mm²** | w/w w/d | 0,75 | | 1,50 | | 1,50 | | | | 1,20 | | 1,50 | | | | 1,20 | |
| | d/d | 0,90 | | 1,50 | | 1,50 | | | | 1,50 | | 1,50 | | | | 1,50 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.
[3)] No performance assessed.

**Table C78.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | |
| **2,5 / 2 N/mm²** | w/w w/d | 0,4 | | |
| | d/d | 0,5 | | |
| **5 / 4 N/mm²** | w/w w/d | 0,9 | | |
| | d/d | 0,9 | | |
| **8 / 6 N/mm²** | w/w w/d | 1,2 | | |
| | d/d | 1,5 | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C78** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under tension loading | |

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## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C79.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |

| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | |
|---|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | |
| **2,5 / 2 N/mm²** | w/w, w/d, d/d | 0,5 | 0,6 |
| **5 / 4 N/mm²** | w/w, w/d, d/d | 0,9 | 1,2 |
| **8 / 6 N/mm²** | w/w, w/d, d/d | 1,5 | 1,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C79.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |

| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | |
|---|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | |
| **2,5 / 2 N/mm²** | w/w, w/d, d/d | 0,5 | 0,6 |
| **5 / 4 N/mm²** | w/w, w/d, d/d | 0,9 | 1,2 |
| **8 / 6 N/mm²** | w/w, w/d, d/d | 1,5 | 1,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C79** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under shear loading | |

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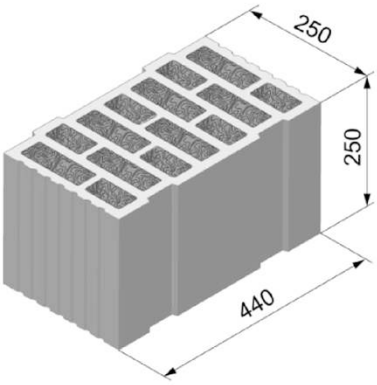
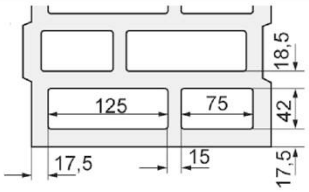
## Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 250 | 440 | 250 |
| Mean gross dry density ρ | [kg/dm³] | 0,7 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 8 / 6 or 10 / 8 or 12,5 / 10 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B18

**Table C80.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | | **-** | |
| | | | | | | **11x85** | | | | | | **15x85** | | | | | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | | **20x200** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | | 2 | | | | 5 | | 2 | | 5 | | 6 | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | | 60 | | | | | | | | | | | | | | | |
| Spacing | $s_{min}$ ∥ | | | 80 | | | | | | | | | | | | | | | |
| | $s_{cr}$ ∥ | | | 250 | | | | | | | | | | | | | | | |
| | $s_{min}$ ⊥ | | | 80 | | | | | | | | | | | | | | | |
| | $s_{cr}$ ⊥ | | | 250 | | | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | | | | |
| Rotary drilling with carbide drill | | | | | | | | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C80.2:** Group factors

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | | **-** | |
| | | | | | | **11x85** | | | | | | **15x85** | | | | | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | | **20x200** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | | 1,3 | | | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | | 1,3 | | | | | | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | | 0,8 | | | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | | 1,3 | | | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool;
dimensions, installation parameters, Group factors

**Annex C80**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1:2011+A1:2015

**Table C81.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 5 | 6 | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | |
| Spacing | $s_{min}$ II | [mm] | 80 | | |
| | $s_{cr}$ II | [mm] | 250 | | |
| | $s_{min}$ ⊥ | [mm] | 80 | | |
| | $s_{cr}$ ⊥ | [mm] | 250 | | |
| **Drilling method** | | | | | |
| Rotary drilling with carbide drill | | | | | |

**Table C81.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,3 | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | [-] | 1,3 | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | [-] | 0,8 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | [-] | 1,3 | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool;
dimensions, installation parameters, Group factors

**Annex C81**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1:2011+A1:2015

**Table C82.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | | M6 | M8 | M6 | M8 | - | | M8 | M10 | M8 | M10 | - | | M12 | M16 | M12 | M16 | M12 | M16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | | M6 | M8 | - | | - | | M10 | M12 | - | | - | | - | |
| | | | | | | 11x85 | | | | | | 15x85 | | | | | | | |
| **Selkent perforated sleeve H K** | | 12x50 | | 12x85 | | 16x85 | | | | 16x130 | | 20x85 | | | | 20x130 | | 20x200 | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | | | | | | | | | |
| **8 / 6 N/mm²** | w/w | w/d | 0,75 | | 1,50 | | 1,20 | | | | 1,50 | | | | | | | | 2,50 |
| | d/d | | 0,90 | | 1,50 | | 1,20 | | | | 1,50 | | | | | | | | 2,50 |
| **10 / 8 N/mm²** | w/w | w/d | 0,90 | | 1,50 | | 1,20 | | | | 1,50 | | | | | | | | 2,50 |
| | d/d | | 0,90 | | 2,00 | | 1,50 | | | | 2,00 | | | | | | | | 3,00 |
| **12,5 / 10 N/mm²** | w/w | w/d | 0,90 | | 2,00 | | 1,50 | | | | 2,00 | | | | | | | | 3,00 |
| | d/d | | 1,20 | | 2,00 | | 1,50 | | | | 2,00 | | | | | | | | 3,50 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C82.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | |
| **8 / 6 N/mm²** | w/w | w/d | 1,5 | |
| | d/d | | 1,5 | |
| **10 / 8 N/mm²** | w/w | w/d | 1,5 | |
| | d/d | | 2,0 | |
| **12,5 / 10 N/mm²** | w/w | w/d | 2,0 | |
| | d/d | | 2,0 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C82** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool,<br>Characteristic resistance under tension loading | |

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## Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool, EN 771-1:2011+A1:2015

**Table C83.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | M6 M8 | M6 M8 | - | M8 M10 | M8 M10 | - | M12 M16 | M12 M16 | M12 M16 |
|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | - | M6 M8<br>11x85 | - | - | M10 M12<br>15x85 | - | - | - |
| **Selkent perforated sleeve H K** | 12x50 | 12x85 | 16x85 | | 16x130 | 20x85 | | 20x130 | 20x200 |

| $V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | |
| **8 / 6 N/mm²** | w/w w/d<br>d/d | 0,9 | | | 1,2 | 0,9 | 1,2 | 1,2 |
| **10 / 8 N/mm²** | w/w w/d<br>d/d | 0,9 | | | 1,5 | 0,9 | 1,5 | 1,2 |
| **12,5 / 10 N/mm²** | w/w w/d<br>d/d | 1,2 | | | 1,5 | 1,2 | 1,5 | 1,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C83.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |

| $V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C | | | | |
|---|---|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | |
| **8 / 6 N/mm²** | w/w w/d<br>d/d | 1,2 | | 1,2 |
| **10 / 8 N/mm²** | w/w w/d<br>d/d | 1,5 | | 1,5 |
| **12,5 / 10 N/mm²** | w/w w/d<br>d/d | 1,5 | | 1,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

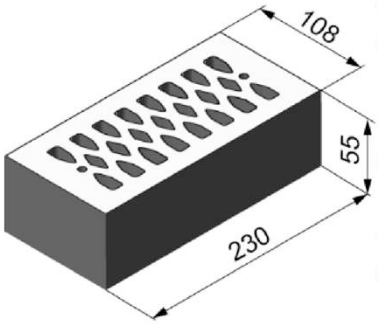
Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, Porotherm W 44, filled with mineral wool;
Characteristic resistance under shear loading

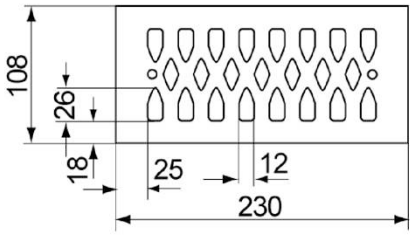
**Annex C83**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger. | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 230 | 108 | 55 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,4 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 2,5 / 2 or 5 / 4 or 8 / 6 or 10 / 8 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B18

### Table C84.1: Installation parameters

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6** / **11x85** | **M8** / **11x85** | - | **M10** / **15x85** | **M12** / **15x85** | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **20x85** | | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | | | | | | |
| **General installation parameters** | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | |
| Spacing | $s_{min}$ ∥ | | 80 | | | | | | | |
| | $s_{cr}$ ∥ | | 230 | | | | | | | |
| | $s_{min}$ ⊥ | | 60 | | | | | | | |
| | $s_{cr}$ ⊥ | | 60 | | | | | | | |
| **Drilling method** | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C84.2: Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6** / **11x85** | **M8** / **11x85** | - | **M10** / **15x85** | **M12** / **15x85** | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **20x85** | | |
| Group factors $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 2 | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min}$ ∥) | | | | | | | | | | |
| Group factors $\alpha_{g,N}$ ($s_{min}$ ⊥) | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min}$ ⊥) | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C84**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C85.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading [1)]

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **-** | | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **M10** | **M12** | **-** | |
| | | | | | | **11x85** | | | | **15x85** | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **20x85** | | | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [3)]** | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [2)] | Use conditions | | | | | | | | | | | | |
| **2,5 / 2 N/mm²** | w/w w/d | 0,30 | | 0,90 | | 0,75 | | | | 0,50 | | | |
| | d/d | 0,30 | | 0,90 | | 0,90 | | | | 0,60 | | | |
| **5 / 4 N/mm²** | w/w w/d | 0,60 | | 1,50 | | 1,50 | | | | 0,90 | | | |
| | d/d | 0,75 | | 2,00 | | 1,50 | | | | 1,20 | | | |
| **8 / 6 N/mm²** | w/w w/d | 0,90 | | 2,50 | | 2,50 | | | | 1,50 | | | |
| | d/d | 0,90 | | 3,00 | | 2,50 | | | | 1,50 | | | |
| **10 / 8 N/mm²** | w/w w/d | 1,20 | | 3,50 | | 3,00 | | | | 2,00 | | | |
| | d/d | 1,50 | | 4,00 | | 3,50 | | | | 2,50 | | | |

[1)] If the fixing is in a solid area, for use condition w/w, the characteristic value shall be reduced with the factor 0,64.

[2)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

[3)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C85.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **-** | | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **M10** | **M12** | **-** | |
| | | | | | | **11x85** | | | | **15x85** | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **20x85** | | | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | | | |
| **2,5 / 2 N/mm²** | w/w w/d | 0,6 | | | | | | | | 0,4 | | | |
| | d/d | | | | | | | | | | | | |
| **5 / 4 N/mm²** | w/w w/d | 1,2 | | | | | | | | 0,9 | | | |
| | d/d | | | | | | | | | | | | |
| **8 / 6 N/mm²** | w/w w/d | 1,5 | | | | | | | | 1,2 | | | |
| | d/d | | | | | | | | | | | | |
| **10 / 8 N/mm²** | w/w w/d | 2,5 | | | | | | | | 1,5 | | | |
| | d/d | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength. Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C85** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under tension and shear loading | |

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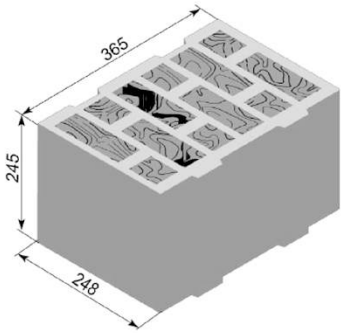
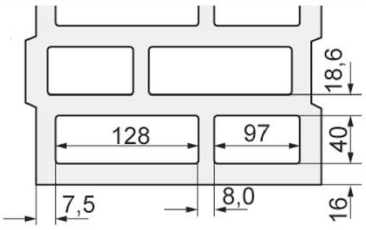
## Vertical perforated brick HLz filled with mineral wool, EN 771-1:2011+A1:2015




| Producer | | e.g. Wienerberger | | |
|---|---|---|---|---|
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 365 | ≥ 248 | ≥ 245 |
| Mean gross dry density ρ | [kg/dm³] | 0,6 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 10 / 8 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B19

**Table C86.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **M6** **M8** **11x85** | **-** | | **-** | | **M10** **M12** **15x85** | **-** | | **-** | |
| **Selkent perforated sleeve H K** | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |

| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | |
|---|---|---|---|
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 / 4 |
| **General installation parameters** | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 100 |
| Spacing | $s_{min}$ ∥ | [mm] | 250 |
| | $s_{cr}$ ∥ | [mm] | 250 |
| | $s_{min}$ ⊥ | [mm] | 245 |
| | $s_{cr}$ ⊥ | [mm] | 245 |
| **Drilling method** | | | |
| Hammer drilling with hard metal hammer drill | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C86.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M8** | **M10** | **M8** | **M10** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | **12x85** | | **16x85** | | **16x130** | | **20x85** | | **20x130** | |

| | | | |
|---|---|---|---|
| Group factors | $\alpha_{g,N}(s_{min} \parallel) = \alpha_{g,V}(s_{min} \parallel)$ | [-] | 2 |
| | $\alpha_{g,N}(s_{min} \perp) = \alpha_{g,V}(s_{min} \perp)$ | [-] | 2 |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz filled with mineral wool, dimensions, installation parameters, Group factors

**Annex C86**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz filled with mineral wool, EN 771-1:2011+A1:2015

**Table C87.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 4 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 100 | | |
| Spacing | $s_{min} \parallel$ | [mm] | 250 | | |
| | $s_{cr} \parallel$ | [mm] | | | |
| | $s_{min} \perp$ | [mm] | 245 | | |
| | $s_{cr} \perp$ | [mm] | | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C87.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min} \parallel$) | [-] | 2 | | |
| | $\alpha_{g,V}$ ($s_{min} \parallel$) | [-] | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz filled with mineral wool, dimensions, installation parameters, Group factors

**Annex C87**

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## Vertical perforated brick HLz filled with mineral wool, EN 771-1:2011+A1:2015

**Table C88.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **M6** / **11x85** | **M8** / **11x85** | **-** | | **-** | **M10** / **15x85** | **M12** / **15x85** | **-** | | **-** | | **-** |
| **Selkent perforated sleeve H K** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | | | | | |
| **10 / 8 N/mm²** | w/w | 2,0 | | 1,5 | | 2,5 | | | 2,0 | | | 2,0 | | 3,0 | |
| | d/d | 2,0 | | 2,0 | | 3,0 | | | 2,0 | | | 2,0 | | 3,0 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C no performance assessed.

**Table C88.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | |
| **10 / 8 N/mm²** | w/w | 1,5 | | 2,0 |
| | d/d | 2,0 | | 2,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C no performance assessed.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C88** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz filled with mineral wool, Characteristic resistance under tension loading | |

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## Vertical perforated brick HLz filled with mineral wool, EN 771-1:2011+A1:2015

**Table C89.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | | **-** | |
| | | | | **11x85** | | | | | | **15x85** | | | | | | | |
| **Selkent perforated sleeve H K** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | | **20x200** | |
| $V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ **[kN]; temperature range 50/80°C** [2] | | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use con-ditions | | | | | | | | | | | | | | | | |
| **10 / 8 N/mm²** | w/w | 2,5 | 3,0 | 3,0 | | | | 3,0 | | 1,5 | | | | 1,5 | | 1,5 | 1,5 |
| | d/d | 2,5 | 3,0 | 3,0 | | | | 3,0 | | 1,5 | | | | 1,5 | | 1,5 | 1,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] For temperature range 72/120°C no performance assessed.

**Table C89.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| $V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ **[kN]; temperature range 50/80°C** [2] | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use con-ditions | | | |
| **10 / 8 N/mm²** | w/w | 3,0 | | 1,5 |
| | d/d | 3,0 | | 1,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] For temperature range 72/120°C no performance assessed.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C89** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz filled with mineral wool, Characteristic resistance under shear loading | |

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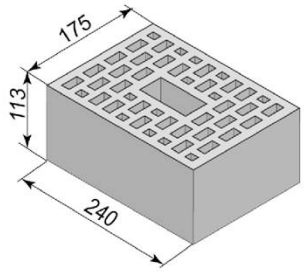
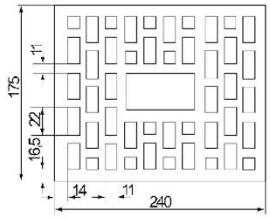
## Vertical perforated brick HLz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Wienerberger | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 240 | ≥ 175 | ≥ 113 |
| Mean gross dry density ρ | [kg/dm³] | 0,9 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 12,5 / 10 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B19

**Table C90.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **M6** **M8** **11x85** | **-** | | **-** | | **M10** **M12** **15x85** | **-** | | **-** | |
| **Selkent perforated sleeve H K** | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | 4 | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 100 | | | | | | | | | |
| Spacing | $s_{min} \parallel$ | | 240 | | | | | | | | | |
| | $s_{cr} \parallel$ | | | | | | | | | | | |
| | $s_{min} \perp$ | | 115 | | | | | | | | | |
| | $s_{cr} \perp$ | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C90.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M8** | **M10** | **M8** | **M10** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | **12x85** | | **16x85** | | **16x130** | | **20x85** | | **20x130** | |
| Group factors $\frac{\alpha_{g,N}(s_{min} \parallel)}{\alpha_{g,V}(s_{min} \parallel)} = \frac{\alpha_{g,N}(s_{min} \perp)}{\alpha_{g,V}(s_{min} \perp)}$ | [-] | 2 | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C90**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C91.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 4 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 100 | | |
| Spacing | $s_{min} \parallel$ | [mm] | 240 | | |
| | $s_{cr} \parallel$ | [mm] | | | |
| | $s_{min} \perp$ | [mm] | 115 | | |
| | $s_{cr} \perp$ | [mm] | | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C91.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min} \parallel$) | [-] | 2 | | |
| | $\alpha_{g,V}$ ($s_{min} \parallel$) | [-] | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Vertical perforated brick HLz, dimensions, installation parameters, Group factors

**Annex C91**

Deutsches Institut für Bautechnik DIBt

## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C92.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | |
| Mean compressive strength/ Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | | | | |
| **12,5 / 10 N/mm²** | w/w | 3,5 | | 4,0 | | | 4,5 | | 4,5 | | | | 4,0 | |
| | d/d | 4,0 | | 4,5 | | | 5,0 | | 5,0 | | | | 4,0 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C no performance assessed.

**Table C92.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | |
| Mean compressive strength/ Min. compressive strength single brick [1)] | Use conditions | | |
| **12,5 / 10 N/mm²** | w/w | 4,5 | 4,0 |
| | d/d | 5,0 | 4,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C no performance assessed.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C92** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under tension loading | |

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## Vertical perforated brick HLz, EN 771-1:2011+A1:2015

**Table C93.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use con-ditions | | | | | | | | | | | | | | |
| **12,5 / 10 N/mm²** | w/w | 4,0 | 5,5 | 4,0 | 5,5 | 5,5 | 7,0 | 5,5 | 7,0 | 7,0 | 6,0 | 6,0 | 8,0 | 6,0 | 8,0 |
| | d/d | 4,0 | 5,5 | 4,0 | 5,5 | 5,5 | 7,0 | 5,5 | 7,0 | 7,0 | 6,0 | 6,0 | 8,0 | 6,0 | 8,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C no performance assessed.

**Table C93.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

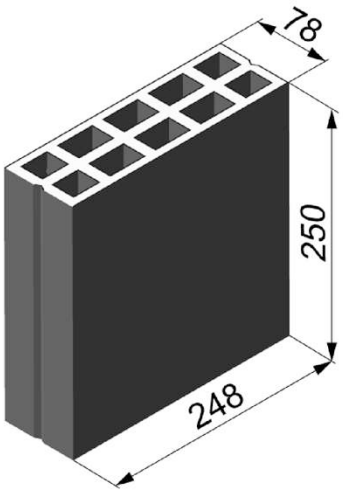
| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C [2)]** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use con-ditions | | | |
| **12,5 / 10 N/mm²** | w/w | 7,0 | 6,0 | 8,0 |
| | d/d | 7,0 | 6,0 | 8,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C no performance assessed.

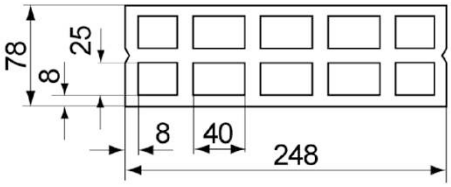
Factor for job site tests and displacements see annex C123

| Injection system Selkent SEL-V+ for masonry | **Annex C93** |
|---|---|
| **Performance**<br>Vertical perforated brick HLz, Characteristic resistance under shear loading | |

## Horizontal perforated brick LLz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | - | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 250 | 78 | 248 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 0,7 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 2,5 / 2 or 5 / 4 or 8 / 6 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B19

### Table C94.1: Installation parameters

| **Anchor rod** | | | **M6** | **M8** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **12x50** | |
| **Anchor rod with Selkent perforated sleeve H K** | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 2 | |
| **General installation parameters** | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 100 | |
| Spacing | $s_{min}$ ∥ | | 75 | |
| | $s_{cr}$ ∥ | | 250 | |
| | $s_{min} \perp = s_{cr} \perp$ | | 250 | |
| **Drilling method** | | | | |
| Hammer drilling with hard metal hammer drill | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C94.2: Group factors

| **Anchor rod** | | | **M6** | **M8** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **12x50** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,6 | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | 1,1 | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | 2,0 | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Horizontal perforated brick LLz, dimensions, installation parameters, Group factors

**Annex C94**

Deutsches Institut für Bautechnik DIBt

## Horizontal perforated brick LLz, EN 771-1:2011+A1:2015

**Table C95.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M6** | **M8** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | | **12x50** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | |
| **2,5 / 2 N/mm²** | w/w w/d | 0,5 | |
| | d/d | 0,6 | |
| **5 / 4 N/mm²** | w/w w/d | 0,9 | |
| | d/d | 1,2 | |
| **8 / 6 N/mm²** | w/w w/d | 1,5 | |
| | d/d | 1,5 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength..
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C95.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M6** | **M8** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | | **12x50** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | |
| **2,5 / 2 N/mm²** | w/w w/d | 0,5 | |
| | d/d | | |
| **5 / 4 N/mm²** | w/w w/d | 0,9 | |
| | d/d | | |
| **8 / 6 N/mm²** | w/w w/d | 1,5 | |
| | d/d | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

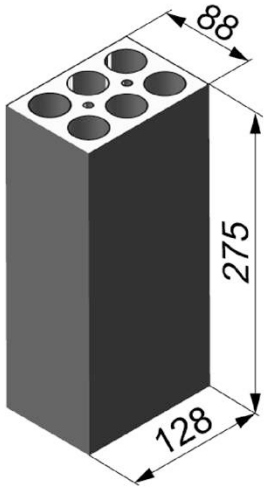
Factor for job site tests and displacements see annex C123.

Injection system Selkent SEL-V+ for masonry

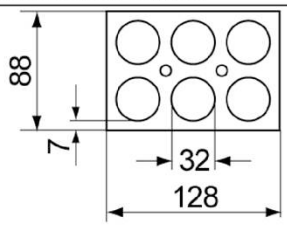
**Performance**
Horizontal perforated brick LLz, Characteristic resistance under tension and shear loading

**Annex C95**

## Horizontal perforated brick LLz, EN 771-1:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Cermanica Farreny S.A. | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 275 | 88 | 128 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 0,8 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 2,5 / 2 | | |
| Standard or annex | | EN 771-1:2011+A1:2015 | | |




Dimension see also Annex B19

### Table C96.1: Installation parameters

| **Anchor rod** | | | **M6** | **M8** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **12x50** | |
| **Anchor rod with Selkent perforated sleeve H K** | | | | |
| Max. installation torque | $maxT_{inst}$ | [Nm] | 2 | |
| **General installation parameters** | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | |
| Spacing | $s_{min}$ ∥ | | 75 | |
| | $s_{cr}$ ∥ | | 275 | |
| | $s_{min}$ ⊥ | | 75 | |
| | $s_{cr}$ ⊥ | | 130 | |
| **Drilling method** | | | | |
| Hammer drilling with hard metal hammer drill | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C96.2: Group factors

| **Anchor rod** | | | **M6** | **M8** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **12x50** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,3 | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | 1,5 | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,3 | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,5 | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Horizontal perforated brick LLz, dimensions, installation parameters, Group factors

**Annex C96**

Deutsches Institut für Bautechnik DIBt

## Horizontal perforated brick LLz, EN 771-1:2011+A1:2015

**Table C97.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M6** | **M8** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | | **12x50** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C** [2] | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | |
| **2,5 / 2 N/mm²** | w/w, w/d, d/d | 1,5 | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C97.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M6** | **M8** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | | **12x50** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | |
| **2,5 / 2 N/mm²** | w/w, w/d, d/d | 1,2 | |

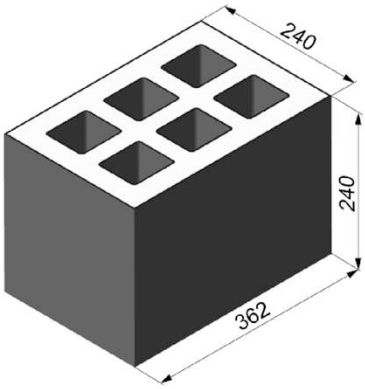
[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

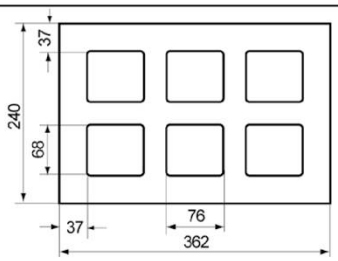
| Injection system Selkent SEL-V+ for masonry | **Annex C97** |
|---|---|
| **Performance**<br>Horizontal perforated brick LLz, Characteristic resistance under tension and shear loading | |

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | - | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 362 | 240 | 240 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,0 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 2,5 / 2 or 5 / 4 | | |
| Standard or annex | | EN 771-3:2011+A1:2015 | | |




Dimension see also Annex B19

**Table C98.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | **M10** **M12** **15x85** | | - | | - | | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | | | | | |
| Spacing | $s_{min}$ ∥ | | 100 | | | | | | | | | | | | | |
| | $s_{cr}$ ∥ | | 362 | | | | | | | | | | | | | |
| | $s_{min} \perp = s_{cr} \perp$ | | 240 | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C98.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | **M10** **M12** **15x85** | | - | | - | | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,2 | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | | 1,1 | | | | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | 2,0 | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Light-weight concrete hollow block Hbl, dimensions, installation parameters, Group factors

**Annex C98**

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015

**Table C99.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | |
| Spacing | $s_{min}$ II | | 100 | | |
| | $s_{cr}$ II | | 362 | | |
| | $s_{min} \perp = s_{cr} \perp$ | | 240 | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C99.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,2 | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | 1,1 | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | 2,0 | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Light-weight concrete hollow block Hbl, dimensions, installation parameters, Group factors

**Annex C99**

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015

**Table C100.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | M6 | M8 | M6 | M8 | - | | M8 | M10 | M8 | M10 | - | | M12 | M16 | M12 | M16 | M12 | M16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | M6 | M8 | - | | - | | M10 | M12 | - | | - | | - | |
| | | | | | 11x85 | | | | | | 15x85 | | | | | | | |
| **Selkent perforated sleeve H K** | 12x50 | | 12x85 | | 16x85 | | | | 16x130 | | 20x85 | | | | 20x130 | | 20x200 | |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C** [2] | | | | |
|---|---|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | |
| **2,5 / 2 N/mm²** | w/w w/d | 1,2 | 1,5 | 2,5 |
| | d/d | 1,2 | 1,5 | 2,5 |
| **5 / 4 N/mm²** | w/w w/d | 2,0 | 3,0 | 5,0 |
| | d/d | 2,5 | 3,0 | 5,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C100.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C** [2] | | |
|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | |
| **2,5 / 2 N/mm²** | w/w w/d | 1,5 |
| | d/d | 1,5 |
| **5 / 4 N/mm²** | w/w w/d | 3,0 |
| | d/d | 3,0 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C100** |
|---|---|
| **Performance**<br>Light-weight concrete hollow block Hbl, Characteristic resistance under tension loading | |

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015

**Table C101.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | M6 M8 | M6 M8 | - | M8 M10 | M8 M10 | - | M12 M16 | M12 M16 | M12 M16 |
|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | - | M6 M8<br>**11x85** | - | - | M10 M12<br>**15x85** | - | - | - |
| **Selkent perforated sleeve H K** | **12x50** | **12x85** | **16x85** | | **16x130** | **20x85** | | **20x130** | **20x200** |

| $V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C | | |
|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | |
| **2,5 / 2 N/mm²** | w/w w/d<br>d/d | 0,9 |
| **5 / 4 N/mm²** | w/w w/d<br>d/d | 2,0 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C101.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |

| $V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C | | |
|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | |
| **2,5 / 2 N/mm²** | w/w w/d<br>d/d | 0,9 |
| **5 / 4 N/mm²** | w/w w/d<br>d/d | 2,0 |

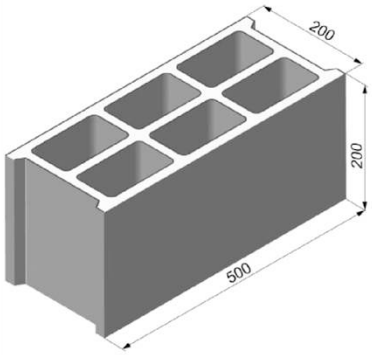
[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

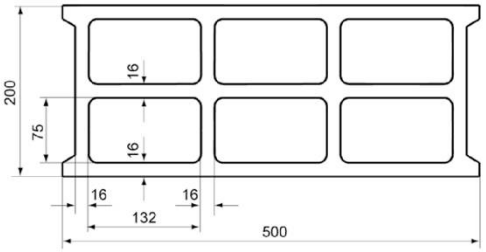
| Injection system Selkent SEL-V+ for masonry | **Annex C101** |
|---|---|
| **Performance**<br>Light-weight concrete hollow block Hbl, Characteristic resistance under shear loading | |

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Sepa | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 500 | 200 | 200 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,0 | | |
| Mean compressive strength / Min. compressive strength single brick [1] | [N/mm²] | 2,5 / 2 or 5 / 4 or 8 / 6 | | |
| Standard or annex | | EN 771-3:2011+A1:2015 | | |




Dimension see also Annex B19

### Table C102.1: Installation parameters

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **M10** | **M12** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6** / **11x85** | **M8** / **11x85** | - | - | | - | | **M10** / **15x85** | **M12** / **15x85** | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **18x130/200** | | **20x85** | | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | |
| Max. installation torque $\max T_{inst}$ | [Nm] | | 1 | | 2 | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | |
| Edge distance $c_{min} = c_{cr}$ | [mm] | | 100 | | | | | | | | | | | |
| Spacing $s_{min} \parallel = s_{cr} \parallel$ | [mm] | | 500 | | | | | | | | | | | |
| Spacing $s_{min} \perp = s_{cr} \perp$ | [mm] | | 200 | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C102.2: Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **M10** | **M12** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6** / **11x85** | **M8** / **11x85** | - | - | | - | | **M10** / **15x85** | **M12** / **15x85** | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **18x130/200** | | **20x85** | | |
| Group factors $\alpha_{g,N}$ ($s_{min} \parallel$) | [-] | | 2 | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min} \parallel$) | [-] | | 2 | | | | | | | | | | | |
| Group factors $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | | 2 | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | | 2 | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Light-weight concrete hollow block Hbl, dimensions, installation parameters, Group factors

**Annex C102**

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015

**Table C103.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **M10** | **M12** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | | - | **M10** **M12** **15x85** | | - |
| **Perforated sleeve Selkent H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **18x130/200** | | **20x85** | | |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | |
|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1)] | use conditions | |
| **2,5 / 2 N/mm²** | w/w w/d | 0,4 |
| | d/d | 0,5 |
| **5 / 4 N/mm²** | w/w w/d | 0,9 |
| | d/d | 0,9 |
| **8 / 6 N/mm²** | w/w w/d | 1,2 |
| | d/d | 1,5 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

[2)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C103.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **M10** | **M12** | **-** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | | - | **M10** **M12** **15x85** | | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **18x130/200** | | **20x85** | | |

| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | |
|---|---|---|
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | |
| **2,5 / 2 N/mm²** | w/w w/d | 0,9 |
| | d/d | |
| **5 / 4 N/mm²** | w/w w/d | 1,5 |
| | d/d | |
| **8 / 6 N/mm²** | w/w w/d | 2,5 |
| | d/d | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C103** |
|---|---|
| **Performance**<br>Light-weight concrete hollow block Hbl,<br>Characteristic resistance under tension and shear loading | |

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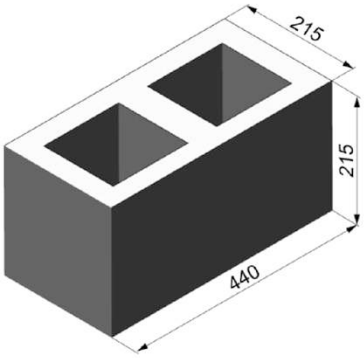
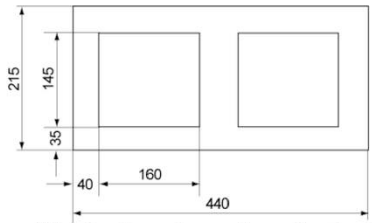
## Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Roadstone wood | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | 440 | 215 | 215 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,2 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 5 / 4 or 8 / 6 or 10 / 8 or 12,5 / 10 | | |
| Standard or annex | | EN 771-3:2011+A1:2015 | | |




Dimension see also Annex B20

**Table C104.1:** Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 2 | | | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 110 | | | | | | | | | | | | | |
| Spacing | $s_{min}$ II | | 100 | | | | | | | | | | | | | |
| | $s_{cr}$ II | | 440 | | | | | | | | | | | | | |
| | $s_{min}$ ⊥ | | 100 | | | | | | | | | | | | | |
| | $s_{cr}$ ⊥ | | 215 | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C104.2:** Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | |
| | | | | | **11x85** | | | | | | **15x85** | | | | | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,4 | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | 2,0 | | | | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,4 | | | | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,2 | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Light-weight concrete hollow block Hbl, dimensions, installation parameters, Group factors

**Annex C104**

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015

**Table C105.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 110 | | |
| Spacing | $s_{min}$ II | | 100 | | |
| | $s_{cr}$ II | | 440 | | |
| | $s_{min}$ ⊥ | | 100 | | |
| | $s_{cr}$ ⊥ | | 215 | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C105.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,4 | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | 2,0 | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,4 | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,2 | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Light-weight concrete hollow block Hbl, dimensions, installation parameters, Group factors

**Annex C105**

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015

**Table C106.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **M10** | **M12** | **-** | | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **-** | | **M10** | **M12** | **-** | |
| | | | | | **11x85** | | | | | | | | **15x85** | | | |
| **Perforated sleeve Selkent H K** | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **18x130/200** | | **20x85** | | | |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
|---|---|---|---|---|
| Mean compressive strength / Min. comp. strength single brick [1)] | Use conditions | | | |
| **5 / 4 N/mm²** | w/w \| w/d | 0,9 | 1,2 | 2,0 |
| | d/d | 1,2 | 1,5 | 2,0 |
| **8 / 6 N/mm²** | w/w \| w/d | 1,5 | 2,0 | 3,0 |
| | d/d | 1,5 | 2,0 | 3,0 |
| **10 / 8 N/mm²** | w/w \| w/d | 2,0 | 2,5 | 3,5 |
| | d/d | 2,0 | 3,0 | 4,0 |
| **12,5 / 10 N/mm²** | w/w \| w/d | 2,5 | 3,0 | 4,5 |
| | d/d | 3,0 | 3,5 | 5,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C106.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |

| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | |
|---|---|---|---|---|
| Mean compressive strength / Min. comp. strength single brick [1)] | Use conditions | | | |
| **5 / 4 N/mm²** | w/w \| w/d | 1,2 | 2,0 | |
| | d/d | 1,5 | 2,0 | |
| **8 / 6 N/mm²** | w/w \| w/d | 2,0 | 3,0 | |
| | d/d | 2,0 | 3,0 | |
| **10 / 8 N/mm²** | w/w \| w/d | 2,5 | 3,5 | |
| | d/d | 3,0 | 4,0 | |
| **12,5 / 10 N/mm²** | w/w \| w/d | 3,0 | 4,5 | |
| | d/d | 3,5 | 5,0 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C106** |
|---|---|
| **Performance**<br>Light-weight concrete hollow block Hbl, Characteristic resistance under tension loading | |

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## Light-weight concrete hollow block Hbl, EN 771-3:2011+A1:2015

**Table C107.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | **M6** / **11x85** | **M8** / **11x85** | - | - | | **M10** / **15x85** | **M12** / **15x85** | - | - | |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | |

**$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C**

| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **5 / 4 N/mm²** | w/w \| w/d / d/d | 0,75 | 1,20 | 0,75 | 1,20 | 0,75 | 1,20 | |
| **8 / 6 N/mm²** | w/w \| w/d / d/d | 1,20 | 2,00 | 1,20 | 2,00 | 1,20 | 2,00 | |
| **10 / 8 N/mm²** | w/w \| w/d / d/d | 1,50 | 2,50 | 1,50 | 2,50 | 1,50 | 2,50 | |
| **12,5 / 10 N/mm²** | w/w \| w/d / d/d | 2,00 | 3,00 | 2,00 | 3,00 | 2,00 | 3,00 | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C107.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |

**$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C**

| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | |
|---|---|---|---|---|
| **5 / 4 N/mm²** | w/w \| w/d / d/d | 1,2 | | |
| **8 / 6 N/mm²** | w/w \| w/d / d/d | 2,0 | | |
| **10 / 8 N/mm²** | w/w \| w/d / d/d | 2,5 | | |
| **12,5 / 10 N/mm²** | w/w \| w/d / d/d | 3,0 | | |

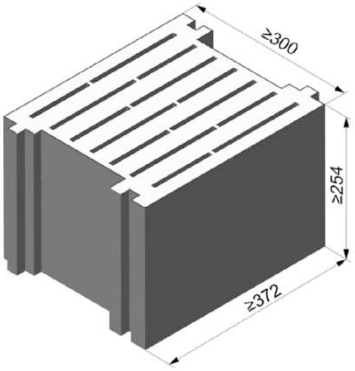
[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

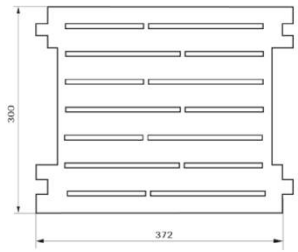
| Injection system Selkent SEL-V+ for masonry | **Annex C107** |
|---|---|
| **Performance**<br>Light-weight concrete hollow block Hbl, Characteristic resistance under shear loading | |

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015




| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Sepa | | |
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 372 | ≥ 300 | ≥ 254 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 0,6 | | |
| Mean compressive strength / Min. compressive strength single brick 1) | [N/mm²] | 2,5 / 2 | | |
| Standard or annex | | EN 771-3:2011+A1:2015 | | |




Dimension see also Annex B20

### Table C108.1: Installation parameters

| **Anchor rod** | | | **M8** | **M10** | **M10** | **M12** | **M12** | **M16** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **16x130** | | **18x130/200** | | **20x130** | | **22x130/200** | **20x200** | |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 4 | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 130 | | | | | | | | |
| Spacing | $s_{min}$ II = $s_{cr}$ II | | 370 | | | | | | | | |
| | $s_{min} \perp = s_{cr} \perp$ | | 250 | | | | | | | | |
| **Drilling method** | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | |

1) The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C108.2: Group factors

| **Anchor rod** | | | **M8** | **M10** | **M10** | **M12** | **M12** | **M16** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **16x130** | | **18x130/200** | | **20x130** | | **22x130/200** | **20x200** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 2 | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Light-weight concrete solid block Vbl, dimensions, installation parameters, Group factors

**Annex C108**

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015

**Table C109.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M8** | **M10** | **M10** | **M12** | **M12** | **M16** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **16x130** | | **18x130/200** | | **20x130** | | **22x130/200** | **20x200** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | |
| **2,5 / 2 N/mm²** | w/w w/d | 2,0 | | | | 2,5 | | | 3,0 | |
| | d/d | 2,0 | | | | 3,0 | | | 4,0 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C109.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M8** | **M10** | **M10** | **M12** | **M12** | **M16** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **16x130** | | **18x130/200** | | **20x130** | | **22x130/200** | **20x200** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | |
| **2,5 / 2 N/mm²** | w/w w/d | 4,5 | | | | | | 6,5 | | |
| | d/d | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C109** |
|---|---|
| **Performance**<br>Light-weight concrete solid block Vbl,<br>Characteristic resistance under tension and shear loading | |

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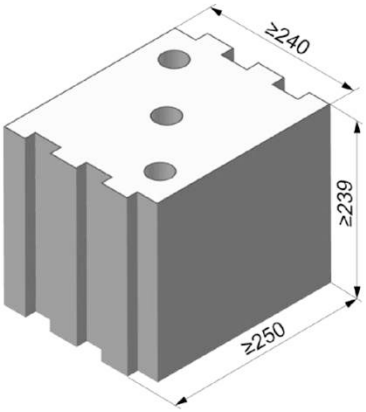
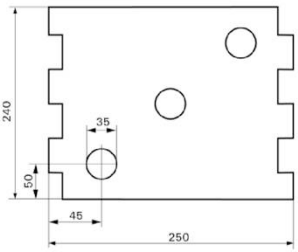
## Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015




| Producer | | KLB | | |
|---|---|---|---|---|
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 250 | ≥ 240 | ≥ 239 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 1,6 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 5 / 4 or 8 / 6 or 10 / 8 | | |
| Standard or annex | | EN 771-3:2011+A1:2015 | | |




Dimension see also Annex B20

### Table C110.1: Installation parameters
(Pre-positioned installation with Selkent perforated sleeve H K)

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | **M10** **M12** **15x85** | | - | | - | | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| **Anchor rod and Selkent internal threaded anchor E with Selkent perforated sleeve H K** | | | | | | | | | | | | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 4 | | | | | | | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 130 | | | | | | | | | | | | | |
| Spacing | $s_{min}$ II = $s_{cr}$ II | [mm] | 250 | | | | | | | | | | | | | |
| | $s_{min} \perp = s_{cr} \perp$ | [mm] | 250 | | | | | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C110.2: Group factors

| **Anchor rod** | **M6** | **M8** | **M6** | **M8** | **-** | **M8** | **M10** | **M8** | **M10** | **-** | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | **M6** **M8** **11x85** | | - | | - | **M10** **M12** **15x85** | | - | | - | | - |
| **Selkent perforated sleeve H K** | **12x50** | | **12x85** | | **16x85** | | | **16x130** | | **20x85** | | | **20x130** | | **20x200** | |
| Group factors $\alpha_{g,N}$ ($s_{min}$ II) | | [-] | 2,0 | | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min}$ II) | | [-] | 2,0 | | | | | | | | | | | | | |
| Group factors $\alpha_{g,N}$ ($s_{min} \perp$) | | [-] | 2,0 | | | | | | | | | | | | | |
| Group factors $\alpha_{g,V}$ ($s_{min} \perp$) | | [-] | 2,0 | | | | | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Light-weight concrete solid block Vbl, dimensions, installation parameters, Group factors

**Annex C110**

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015

**Table C111.1:** Installation parameters
(Push through installation with Selkent perforated sleeve H K)

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| **Anchor rod with Selkent perforated sleeve H K** | | | | | |
| Max. installation torque | $\max T_{inst}$ | [Nm] | 2,0 | | |
| **General installation parameters** | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 130 | | |
| Spacing | $s_{min}$ II = $s_{cr}$ II | [mm] | 250 | | |
| | $s_{min} \perp = s_{cr} \perp$ | [mm] | 250 | | |
| **Drilling method** | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | |

**Table C111.2:** Group factors

| **Anchor rod** | | | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | | **18x130/200** | | **22x130/200** |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 2,0 | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | [-] | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | [-] | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | [-] | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Light-weight concrete solid block Vbl, dimensions, installation parameters, Group factors

**Annex C111**

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015

**Table C112.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Pre-positioned installation)

| **Anchor rod** | M6 | M8 | M6 | M8 | - | | M8 | M10 | M8 | M10 | - | | M12 | M16 | M12 | M16 | M12 | M16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | - | | - | | M6 | M8 | - | | - | | M10 | M12 | - | | - | | - | |
| | | | | | 11x85 | | | | | | 15x85 | | | | | | | |
| **Selkent perforated sleeve H K** | 12x50 | | 12x85 | | 16x85 | | | | 16x130 | | 20x85 | | | | 20x130 | | 20x200 | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | | | | | | | | |
| Mean compressive strength/ Min. compressive strength single brick [1)] | Use conditions | | | | | | | | | | | | | | | | | |
| **5 / 4 N/mm²** | w/w | w/d | 1,2 | | 2,0 | | 2,5 | | | | 3,0 | | | | | | | |
| | d/d | | 2,0 | | 3,5 | | 4,0 | | | | 5,0 | | | | | | | |
| **8 / 6 N/mm²** | w/w | w/d | 1,5 | | 3,0 | | 4,0 | | | | 5,0 | | | | | | | |
| | d/d | | 3,0 | | 5,0 | | 6,5 | | | | 7,5 | | | | | | | |
| **10 / 8 N/mm²** | w/w | w/d | 2,0 | | 4,0 | | 5,0 | | | | 6,5 | | | | | | | |
| | d/d | | 4,0 | | 7,0 | | 8,5 | | | | 9,0 | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

**Table C112.2:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading (Push through installation)

| **Anchor rod** | **M10** | **M12** | **M16** |
|---|---|---|---|
| **Selkent perforated sleeve H K** | **18x130/200** | | **22x130/200** |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | |
| Mean compressive strength/ Min. compressive strength single brick [1)] | Use conditions | | |
| **5 / 4 N/mm²** | w/w w/d | 2,5 | 3,0 |
| | d/d | 4,0 | 5,0 |
| **8 / 6 N/mm²** | w/w w/d | 4,0 | 5,0 |
| | d/d | 6,5 | 7,5 |
| **10 / 8 N/mm²** | w/w w/d | 5,0 | 6,5 |
| | d/d | 8,5 | 9,0 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\ (72/120°C)} = 0{,}83 \cdot N_{Rk\ (50/80°C)}$.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C112** |
|---|---|
| **Performance**<br>Light-weight concrete solid block Vbl, Characteristic resistance under tension loading | |

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## Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015

**Table C113.1:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Pre-positioned installation)

| **Anchor rod** | | **M6** | **M8** | **M6** | **M8** | **-** | | **M8** | **M10** | **M8** | **M10** | **-** | | **M12** | **M16** | **M12** | **M16** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | **-** | | **-** | | **M6** | **M8** | **-** | | **-** | | **M10** | **M12** | **-** | | **-** | | **-** | |
| | | | | | | **11x85** | | | | | | **15x85** | | | | | | | |
| **Selkent perforated sleeve H K** | | **12x50** | | **12x85** | | **16x85** | | | | **16x130** | | **20x85** | | | | **20x130** | | **20x200** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | | | | | | | | | | | | | | | | |
| **5 / 4 N/mm²** | w/w w/d d/d | 2,0 | 3,0 | 2,0 | 3,0 | 2,0 | | 3,5 | | | | 4,5 | | | | | | | |
| **8 / 6 N/mm²** | w/w w/d d/d | 3,0 | 4,5 | 3,0 | 4,5 | 3,0 | | 5,5 | | | | 6,5 | | | | | | | |
| **10 / 8 N/mm²** | w/w w/d d/d | 4,0 | 6,0 | 4,0 | 6,0 | 4,0 | | 7,0 | | | | 8,5 | | | | | | | |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

**Table C113.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading (Push through installation)

| **Anchor rod** | | **M10** | **M12** | **M16** |
|---|---|---|---|---|
| **Selkent perforated sleeve H K** | | **18x130/200** | | **22x130/200** |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | |
| Mean compressive strength / Min. compressive strength single brick [1] | Use conditions | | | |
| **5 / 4 N/mm²** | w/w w/d d/d | 3,5 | | 4,5 |
| **8 / 6 N/mm²** | w/w w/d d/d | 5,5 | | 6,5 |
| **10 / 8 N/mm²** | w/w w/d d/d | 7,0 | | 8,5 |

[1] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C113** |
|---|---|
| **Performance**<br>Light-weight concrete solid block Vbl, Characteristic resistance under shear loading | |

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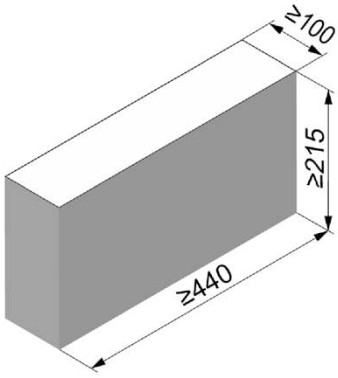
## Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015




| Producer | | Roadstone wood | | |
|---|---|---|---|---|
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 440 | ≥ 100 | ≥ 215 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 2,0 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 5 / 4 or 8 / 6 or 10 / 8 or 12,5 / 10 | | |
| Standard or annex | | EN 771-3:2011+A1:2015 | | |

### Table C114.1: Installation parameters

| **Anchor rod** | | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor rod without perforated sleeve** | | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 50 | 70 | 50 | 70 | 50 | 70 | 50 | 70 | 50 | 70 |
| Max. installation torque | max $T_{inst}$ | [Nm] | 4 | | 10 | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 100 | | | | | | | | | |
| Spacing | $s_{min}$ II | | 75 | | | | | | | | | |
| | $s_{cr}$ II | | 3x $h_{ef}$ | | | | | | | | | |
| | $s_{min}$ ⊥ | | 75 | | | | | | | | | |
| | $s_{cr}$ ⊥ | | 3x $h_{ef}$ | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C114.2: Group factors

| **Anchor rod** | | | **M6** | **M8** | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,6 | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | 1,3 | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,4 | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,3 | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Light-weight concrete solid block Vbl, dimensions, installation parameters, Group factors

**Annex C114**

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015

**Table C115.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| Anchor rod | | M6 | M8 | M10 | M12 | M16 |
|---|---|---|---|---|---|---|
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] ≥ 50 | | | | |
| **5 / 4 N/mm²** | w/w \| w/d | 1,2 | 1,2 | | | |
| | d/d | 2,0 | 2,0 | | | |
| **8 / 6 N/mm²** | w/w \| w/d | 1,5 | 2,0 | | | |
| | d/d | 3,0 | 3,5 | | | |
| **10 / 8 N/mm²** | w/w \| w/d | 2,0 | 2,5 | | | |
| | d/d | 4,0 | 4,5 | | | |
| **12,5 / 10 N/mm²** | w/w \| w/d | 3,0 | 3,5 | | | |
| | d/d | 5,0 | 5,5 | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C115.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| Anchor rod | | M6 | M8 | M10 | M12 | M16 |
|---|---|---|---|---|---|---|
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] ≥ 50 | | | | |
| **5 / 4 N/mm²** | w/w \| w/d | 1,2 | 1,5 | 1,5 | 1,5 | 1,5 |
| | d/d | | | | | |
| **8 / 6 N/mm²** | w/w \| w/d | 2,0 | 2,0 | 2,5 | 2,5 | 2,5 |
| | d/d | | | | | |
| **10 / 8 N/mm²** | w/w \| w/d | 2,5 | 2,5 | 3,0 | 3,0 | 3,5 |
| | d/d | | | | | |
| **12,5 / 10 N/mm²** | w/w \| w/d | 3,0 | 3,5 | 4,0 | 4,0 | 4,5 |
| | d/d | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| | |
|---|---|
| Injection system Selkent SEL-V+ for masonry | **Annex C115** |
| **Performance**<br>Light-weight concrete solid block Vbl,<br>Characteristic resistance under tension and shear loading | |

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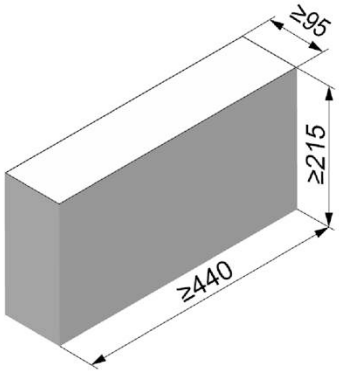
## Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015




| Producer | | Tramac | | |
|---|---|---|---|---|
| Nominal dimensions | [mm] | length L | width W | height H |
| | | ≥ 440 | ≥ 95 | ≥ 215 |
| Mean gross dry density ρ | [kg/dm³] | ≥ 2,0 | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 7,5 / 6 or 10 / 8 or 12,5 / 10 or 15 / 12 | | |
| Standard or annex | | EN 771-3:2011+A1:2015 | | |

### Table C116.1: Installation parameters

| **Anchor rod** | | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor rod without perforated sleeve** | | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 50 | 70 | 50 | 70 | 50 | 70 | 50 | 70 | 50 | 70 |
| Max. installation torque | max $T_{inst}$ | [Nm] | 4 | | 10 | | | | | | | |
| **General installation parameters** | | | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 60 | | | | | | | | | |
| Spacing | $s_{min}$ ∥ | [mm] | 75 | | | | | | | | | |
| | $s_{cr}$ ∥ | [mm] | 3x $h_{ef}$ | | | | | | | | | |
| | $s_{min}$ ⊥ | [mm] | 75 | | | | | | | | | |
| | $s_{cr}$ ⊥ | [mm] | 3x $h_{ef}$ | | | | | | | | | |
| **Drilling method** | | | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C116.2: Group factors

| **Anchor rod** | | | **M6** | **M8** | **M10** | **M12** | **M16** |
|---|---|---|---|---|---|---|---|
| Group factors | $\alpha_{g,N}$ ($s_{min}$ ∥) | [-] | 1,9 | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ∥) | [-] | 1,4 | | | | |
| | $\alpha_{g,N}$ ($s_{min}$ ⊥) | [-] | 1,9 | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ ⊥) | [-] | 1,4 | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Light-weight concrete solid block Vbl, dimensions, installation parameters, Group factors

**Annex C116**

Deutsches Institut für Bautechnik DIBt

## Light-weight concrete solid block Vbl, EN 771-3:2011+A1:2015

**Table C117.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| Anchor rod | | M6 | | M8 | | M10 | | M12 | | M16 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | | | |
| | | 50 | 70 | 50 | 70 | 50 | 70 | 50 | 70 | 50 | 70 |
| **7,5 / 6 N/mm²** | w/w w/d | 1,5 | 2,0 | 1,5 | 2,0 | 1,5 | 2,0 | 1,5 | 2,0 | 1,5 | 2,0 |
| | d/d | 2,5 | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 |
| **10 / 8 N/mm²** | w/w w/d | 2,0 | 2,5 | 2,0 | 2,5 | 2,0 | 3,0 | 2,0 | 3,0 | 2,0 | 3,0 |
| | d/d | 3,5 | 4,5 | 3,5 | 4,5 | 3,5 | 5,0 | 3,5 | 5,0 | 3,5 | 5,0 |
| **12,5 / 10 N/mm²** | w/w w/d | 2,5 | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 | 2,5 | 3,5 |
| | d/d | 4,5 | 6,0 | 4,5 | 6,0 | 4,5 | 6,0 | 4,5 | 6,0 | 4,5 | 6,0 |
| **15 / 12 N/mm²** | w/w w/d | 3,0 | 4,0 | 3,0 | 4,0 | 3,0 | 4,5 | 3,0 | 4,5 | 3,0 | 4,5 |
| | d/d | 5,0 | 7,0 | 5,0 | 7,0 | 5,0 | 7,5 | 5,0 | 7,5 | 5,0 | 7,5 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C117.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| Anchor rod | | M6 | M8 | M10 | M12 | M16 |
|---|---|---|---|---|---|---|
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] ≥ 50 | | | | |
| **7,5 / 6 N/mm²** | w/w w/d<br>d/d | 2,0 | 2,0 | 2,0 | 1,5 | 1,5 |
| **10 / 8 N/mm²** | w/w w/d<br>d/d | 2,5 | 2,5 | 3,0 | 2,5 | 2,5 |
| **12,5 / 10 N/mm²** | w/w w/d<br>d/d | 3,5 | 3,5 | 4,0 | 3,0 | 3,0 |
| **15 / 12 N/mm²** | w/w w/d<br>d/d | 4,0 | 4,0 | 4,5 | 3,5 | 3,5 |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C117** |
|---|---|
| **Performance**<br>Light-weight concrete solid block Vbl,<br>Characteristic resistance under tension and shear loading | |

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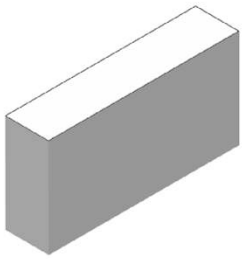
## Autoclaved aerated concrete (cylindrical drill hole), EN 771-4:2011+A1:2015



| | | | | |
|---|---|---|---|---|
| Producer | | e.g. Ytong | | |
| Mean gross dry density ρ | [kg/dm³] | 0,35 | 0,5 | 0,65 |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 2,5 / 2 | 5 / 4 | 8 / 6 |
| Standard or annex | | EN 771-4:2011+A1:2015 | | |

**Table C118.1:** Installation parameters

| **Anchor rod** | | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | | - | | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | | - | | - | | - | | - | | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | | | | | | **11x85** | | **15x85** | |
| **Anchor rod and Selkent internal threaded anchor E without perforated sleeve** | | | | | | | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 85 | | | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 1 | 4 | 1 | 8 | 2 | 12 | 2 | 16 | 2 | 20 | 1 | | 2 | |

| **General installation parameters** | | | |
|---|---|---|---|
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 100 |
| Spacing | $s_{cr}$ ∥ = $s_{min}$ ∥ | | 250 |
| | $h_{ef}$=200mm $s_{min}$ ∥ | | 80 |
| | $h_{ef}$=200mm $s_{cr}$ ∥ | | 3x $h_{ef}$ |
| | $s_{cr}$ ⊥ = $s_{min}$ ⊥ | | 250 |
| | $h_{ef}$=200mm $s_{min}$ ⊥ | | 80 |
| | $h_{ef}$=200mm $s_{cr}$ ⊥ | | 3x $h_{ef}$ |

| **Drilling method** |
|---|
| Hammer drilling with hard metal hammer drill |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Injection system Selkent SEL-V+ for masonry

**Performance**
Autoclaved aerated concrete (cylindrical drill hole), dimensions, installation parameters

**Annex C118**

Deutsches Institut für Bautechnik DIBt

**Table C119.1:** Group factors for autoclaved aerated concrete (Min. compressive strength single brick = 2 N/mm²)

| **Anchor rod** | | | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| Group factors | $h_{ef}$=200 $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 1,6 | | | | | -[1] | | -[1] | |
| | $h_{ef}$=200 $\alpha_{g,V}$ ($s_{min}$ II) | | 1,1 | | | | | -[1] | | -[1] | |
| | $\alpha_{g,N}$ II, $\alpha_{g,V}$ ($s_{min}$ II) | | 2,0 | | | | | | | | |
| | $h_{ef}$=200 $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 1,6 | | | | | -[1] | | -[1] | |
| | $h_{ef}$=200 $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 0,8 | | | | | -[1] | | -[1] | |
| | $\alpha_{g,N}$ ⊥, $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 2,0 | | | | | | | | |

[1] No performance assessed.

**Table C119.2:** Group factors for autoclaved aerated concrete (Min. compressive strength single brick = 4 N/mm²)

| **Anchor rod** | | | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| Group factors | $h_{ef}$=200 $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 0,7 | | | | | -[1] | | -[1] | |
| | $h_{ef}$=200 $\alpha_{gV}$ ($s_{min}$ II) | | 2,0 | | | | | -[1] | | -[1] | |
| | $\alpha_{g,N}$ II, $\alpha_{gV}$ ($s_{min}$ II) | | 2,0 | | | | | | | | |
| | $h_{ef}$=200 $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 0,7 | | | | | -[1] | | -[1] | |
| | $h_{ef}$=200 $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,2 | | | | | -[1] | | -[1] | |
| | $\alpha_{g,N}$ ⊥, $\alpha_{gV}$ ($s_{min}$ ⊥) | | 2,0 | | | | | | | | |

[1] No performance assessed.

**Table C119.3:** Group factors for autoclaved aerated concrete (Min. compressive strength single brick = 6 N/mm²)

| **Anchor rod** | | | **M6** | **M8** | **M10** | **M12** | **M16** | **-** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | **11x85** | | **15x85** | |
| Group factors | $h_{ef}$=200 $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 0,7 | | | | | -[1] | | -[1] | |
| | $h_{ef}$=200 $\alpha_{g,V}$ ($s_{min}$ II) | | 2,0 | | | | | -[1] | | -[1] | |
| | $\alpha_{g,N}$ II, $\alpha_{g,V}$ ($s_{min}$ II) | | 2,0 | | | | | | | | |
| | $h_{ef}$=200 $\alpha_{g,N}$ ($s_{min}$ ⊥) | | 0,7 | | | | | -[1] | | -[1] | |
| | $h_{ef}$=200 $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 1,2 | | | | | -[1] | | -[1] | |
| | $\alpha_{g,N}$ ⊥, $\alpha_{g,V}$ ($s_{min}$ ⊥) | | 2,0 | | | | | | | | |

[1] No performance assessed.

Injection system Selkent SEL-V+ for masonry

**Performance**
Autoclaved aerated concrete (cylindrical drill hole), Group factors

**Annex C119**

Deutsches Institut für Bautechnik DIBt

## Autoclaved aerated concrete (cylindrical drill hole), EN 771-4:2011+A1:2015

**Table C120.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | | **-** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | | - | | - | | - | | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | | | | | **11x85** | | **15x85** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [3]** | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [2] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | | | | | | | |
| | | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 85 | | | |
| **2,5 / 2 N/mm²** | w/w w/d | 1,2 | 1,2 | 1,5 | 2,0 | 1,5 | 3,0 | 1,5 | 3,0 | 2,0 | 3,0 | 1,5 | | 1,5 | |
| | d/d | 1,5 | 3,0 | 1,5 | 3,0 | 1,5 | 3,5 | 2,0 | 4,0 | 2,0 | 4,0 | 1,5 | | 1,5 | |
| **5 / 4 N/mm²** | w/w w/d | 1,2 | -[1] | 2,0 | 1,5 | 2,5 | 3,5 | 2,5 | 3,5 | 2,0 | 3,5 | 2,0 | | 1,5 | |
| | d/d | 1,5 | -[1] | 2,0 | 3,0 | 3,0 | 5,0 | 2,5 | 5,0 | 2,0 | 5,0 | 2,0 | | 1,5 | |
| **8 / 6 N/mm²** | w/w w/d | 1,5 | -[1] | 3,0 | 2,5 | 4,5 | 5,0 | 4,5 | 7,0 | 3,0 | 8,5 | 3,5 | | 2,5 | |
| | d/d | 1,5 | -[1] | 3,5 | 4,0 | 5,0 | 7,0 | 5,0 | 9,0 | 3,0 | 11,5 | 3,5 | | 2,5 | |

[1] No performance assessed.
[2] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[3] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C120.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M6** | | **M8** | | **M10** | | **M12** | | **M16** | | **-** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | | - | | - | | - | | - | | **M6** | **M8** | **M10** | **M12** |
| | | | | | | | | | | | | **11x85** | | **15x85** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [2] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | | | | | | | |
| | | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 85 | | | |
| **2,5 / 2 N/mm²** | w/w w/d d/d | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,5 | 1,2 | 1,2 | 1,2 | 1,2 | | 1,5 | |
| **5 / 4 N/mm²** | w/w w/d d/d | 2,0 | -[1] | 2,5 | 2,0 | 2,0 | 2,0 | 2,5 | 2,0 | 2,0 | 2,0 | 2,0 | | 2,5 | |
| **8 / 6 N/mm²** | w/w w/d d/d | 2,5 | -[1] | 3,0 | 2,5 | 3,0 | 3,0 | 3,5 | 4,0 | 4,5 | 4,5 | 2,5 | | 3,5 | |

[1] No performance assessed.
[2] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C120** |
|---|---|
| **Performance**<br>Autoclaved aerated concrete (cylindrical drill hole),<br>Characteristic resistance under tension and shear loading | |

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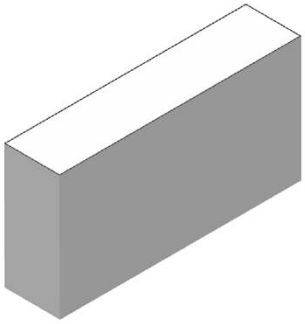
## Autoclaved aerated concrete (conical drill hole with special drill bit PBB), EN 771-4:2011+A1:2015



| Producer | | e.g. Ytong | | |
|---|---|---|---|---|
| Mean gross dry density ρ | [kg/dm³] | 0,35 | 0,5 | 0,65 |
| Mean compressive strength / Min. compressive strength single brick [1)] | [N/mm²] | 2,5 / 2 | 5 / 4 | 8 / 6 |
| Standard or annex | | EN 771-4:2011+A1:2015 | | |

### Table C121.1: Installation parameters

| **Anchor rod** | | | **M8** | | **M10** | | **M12** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | - | **M6** | **M8** |
| | | | | | | | | | **11x85** | |
| **Anchor rod and Selkent internal threaded anchor E without perforated sleeve** | | | | | | | | | | |
| Effective anchorage depth | $h_{ef}$ | [mm] | 75 | 95 | 75 | 95 | 75 | 95 | 85 | |
| Max. installation torque | max $T_{inst}$ | [Nm] | 2 | | | | | | | |
| **General installation parameters** | | | | | | | | | | |
| Edge distance | $c_{min} = c_{cr}$ | [mm] | 120 | 150 | 120 | 150 | 120 | 150 | 150 | |
| Spacing | $s_{cr}$ II = $s_{min}$ II | | 240 | 300 | 240 | 300 | 240 | 300 | 300 | |
| | $s_{cr} \perp = s_{min} \perp$ | | 240 | 250 | 240 | 250 | 240 | 250 | 250 | |
| **Drilling method** | | | | | | | | | | |
| Hammer drilling with hard metal hammer drill | | | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

### Table C121.2: Group factors

| **Anchor rod** | | | **M8** | | **M10** | | **M12** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | | - | - | - | - | - | - | **M6** | **M8** |
| | | | | | | | | | **11x85** | |
| Group factors | $\alpha_{g,N}$ ($s_{min}$ II) | [-] | 2 | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min}$ II) | | | | | | | | | |
| | $\alpha_{g,N}$ ($s_{min} \perp$) | | | | | | | | | |
| | $\alpha_{g,V}$ ($s_{min} \perp$) | | | | | | | | | |

Injection system Selkent SEL-V+ for masonry

**Performance**
Autoclaved aerated concrete (conical drill hole with special drill bit PBB), dimensions, installation parameters, Group factors

**Annex C121**

Deutsches Institut für Bautechnik DIBt

## Autoclaved aerated concrete (conical drill hole with special drill bit PBB), EN 771-4:2011+A1:2015

**Table C122.1:** Characteristic resistance to pull-out failure or brick breakout failure of a single anchor under tension loading

| **Anchor rod** | | **M8** | | **M10** | | **M12** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | - | - | - | **M6** | **M8** |
| | | | | | | | | **11x85** | |
| **$N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,p,c} = N_{Rk,b,c}$ [kN]; temperature range 50/80°C [2)]** | | | | | | | | | |
| Mean compressive strength / Min. compressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | |
| | | 75 | 95 | 75 | 95 | 75 | 95 | 85 | |
| **2,5 / 2 N/mm²** | w/w w/d | 2,0 | 2,5 | 2,0 | 2,5 | 2,0 | 2,5 | 2,0 | |
| | d/d | 2,0 | 2,5 | 2,0 | 2,5 | 2,0 | 2,5 | 2,0 | |
| **5 / 4 N/mm²** | w/w w/d | 3,0 | 3,5 | 3,0 | 3,5 | 3,0 | 3,5 | 3,0 | |
| | d/d | 3,0 | 3,5 | 3,0 | 3,5 | 3,0 | 3,5 | 3,0 | |
| **8 / 6 N/mm²** | w/w w/d | 3,5 | 4,0 | 3,5 | 4,0 | 3,5 | 4,0 | 3,5 | |
| | d/d | 4,0 | 4,5 | 4,0 | 4,5 | 4,0 | 4,5 | 4,0 | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.
[2)] For temperature range 72/120°C: $N_{Rk\,(72/120°C)} = 0{,}83 \cdot N_{Rk\,(50/80°C)}$.

**Table C122.2:** Characteristic resistance to local brick failure or brick edge failure of a single anchor under shear loading

| **Anchor rod** | | **M8** | | **M10** | | **M12** | | **-** | |
|---|---|---|---|---|---|---|---|---|---|
| **Selkent internal threaded anchor E** | | - | - | - | - | - | - | **M6** | **M8** |
| | | | | | | | | **11x85** | |
| **$V_{Rk} = V_{Rk,b} = V_{Rk,c,II} = V_{Rk,c,\perp}$ [kN]; temperature range 50/80°C and 72/120°C** | | | | | | | | | |
| Mean compressive strength / Min. com-pressive strength single brick [1)] | Use conditions | Effective anchorage depth $h_{ef}$ [mm] | | | | | | | |
| | | 75 | 95 | 75 | 95 | 75 | 95 | 85 | |
| **2,5 / 2 N/mm²** | w/w w/d | 2,5 | | | | | | | |
| | d/d | | | | | | | | |
| **5 / 4 N/mm²** | w/w w/d | 4,5 | | | | | | | |
| | d/d | | | | | | | | |
| **8 / 6 N/mm²** | w/w w/d | 6,0 | | | | | | | |
| | d/d | | | | | | | | |

[1)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

Factor for job site tests and displacements see annex C123.

| Injection system Selkent SEL-V+ for masonry | **Annex C122** |
|---|---|
| **Performance**<br>Autoclaved aerated concrete (conical drill hole with special drill bit PBB),<br>Characteristic resistance under tension and shear loading | |

## β-factors for job site tests; displacements

### Table C123.1: β-factors for job site tests

| use conditions | | w/w and w/d | | d/d | |
|---|---|---|---|---|---|
| temperature range [°C] | | 50/80 | 72/120 | 50/80 | 72/120 |
| Material | Size | β-factors | | | |
| solid units | M6 | 0,55 | 0,46 | 0,96 | 0,80 |
| | M8 | 0,57 | 0,51 | | |
| | M10 | 0,59 | 0,52 | | |
| | M12 Selkent E 11x85 | 0,60 | 0,54 | | |
| | M16 Selkent E 15x85 | 0,62 | 0,52 | | |
| | Selkent H 16x85 K | 0,55 | 0,46 | | |
| hollow units | all sizes | 0,86 | 0,72 | 0,96 | 0,80 |
| Autoclaved aerated concrete cylindrical drill hole | all sizes | 0,73 | 0,73 | 0,81 | 0,81 |
| Autoclaved aerated concrete conical drill hole | all sizes | 0,66 | 0,59 | 0,73 | 0,66 |

### Table C123.2: Displacements

| Material | N [kN] | $\delta N_0$ [mm] | $\delta N_\infty$ [mm] | V [kN] | $\delta V_0$ [mm] | $\delta V_\infty$ [mm] |
|---|---|---|---|---|---|---|
| solid units and autoclaved aerated concrete $h_{ef}$=100mm | $\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,03 | 0,06 | $\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,82 | 0,88 |
| hollow units | $\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,48 | 0,06 | $\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$ | 1,71 | 2,56 |
| solid brick Mz NF Annex C4 - C7 | $\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,74 | 1,48 | $\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$ | 1,23 | 1,85 |
| solid brick KS NF Annex C14 / C15 | $\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,20 | 0,40 | $\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,91 | 1,37 |
| AAC $h_{ef}$=200 mm Annex C118 - C120 | $\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$ | 1,03 | 2,06 | $\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$ | 1,25 | 1,88 |
| brick Annex C102 / C103 | $\frac{N_{Rk}}{1,4 * \gamma_{Mm}}$ | 0,03 | 0,06 | $\frac{V_{Rk}}{1,4 * \gamma_{Mm}}$ | 6,44 | 9,66 |

For anchorage in autoclaved aerated concrete (AAC), the partial factor $\gamma_{MAAC}$ shall be used instead of $\gamma_{Mm}$.

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## Chracteristic values under tension and shear loading under fire exposure (single anchor)

**Table C124.1:** Chracteristic values under tension and shear loading under fire exposure; considering all failure modes

| **Brick** | | | Solid brick Mz, NF, acc. to Annex C4 | | | Solid calcium silicate brick KS, NF, acc. to Annex C14 | | | Perforated calcium silicate brick KSL, acc. to Annex C24 | | | Vertical perforated brick HLz, acc. to Annex C28 | | | Vertical perforated brick HLz, acc. to Annex C30 | | | Autoclaved aerated concrete, acc. to Annex C118 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean compressive strength / Min. comp. strength single brick [3] | | | ≥ 15 / ≥ 12 | | | ≥ 15 / ≥ 12 | | | ≥ 10 / ≥ 8 | | | ≥ 5 / ≥ 4 | | | ≥ 7,5 / ≥ 6 | | | ≥ 2,5 / ≥ 2 | | | |
| Size | | | M8 | M10 | M12 | M8 | M10 | M12 | M8 | M10 | M12 | M8 | M10 | M12 | M8 | M10 | M12 | M8 | M10 | M12 | M16 |
| Perforated Sleeve | | | - | | | - | | | 16x130 | | 20x 130 | 16x130 | | 20x 130 | 16x85 | | 20x 85 | - | | | |
| Perforated Sleeve for bridging of unbearing layer | | | - | | | - | | | - | | 20x 200 | - | | 20x 200 | 16x130 | | 20x 130 | - | | | |
| $h_{ef}$ | | [mm] | ≥ 80 | | | ≥ 50 | | | ≥ 130 | | | ≥ 130 | | | ≥ 85 | | | ≥ 100 | | | |
| **Characteristic resistance to failure under tension loading** | | | | | | | | | | | | | | | | | | | | | |
| $N_{Rk,s,fi} = N_{Rk,p,fi} = N_{Rk,b,fi}$ [2] | R30 | [kN] | 0,82 | | | 0,32 | | | 1,07 | 1,09 | 1,10 | 0,31 | | | 0,28 | 0,30 | 0,35 | 0,84 | 0,82 | 0,80 | 0,80 |
| | R60 | | 0,73 | | | 0,31 | | | 0,66 | 0,61 | 0,56 | 0,22 | | | 0,19 | 0,22 | 0,22 | 0,71 | 0,67 | 0,63 | 0,63 |
| | R90 | | 0,64 | | | 0,29 | | | 0,25 | 0,13 | - [1] | 0,13 | | | 0,10 | 0,10 | 0,10 | 0,58 | 0,51 | 0,45 | 0,45 |
| | R120 | | 0,59 | | | 0,28 | | | - [1] | - [1] | - [1] | - [1] | | | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] |
| **Characteristic resistance to failure under shear loading** [2] | | | | | | | | | | | | | | | | | | | | | |
| **without lever arm** | | | | | | | | | | | | | | | | | | | | | |
| $V_{Rk,s,fi}$ | R30 | [kN] | 0,82 | | | 0,32 | | | 1,07 | 1,09 | 1,10 | 0,31 | | | 0,28 | 0,30 | 0,35 | 1,10 | 1,75 | 2,54 | 4,74 |
| | R60 | | 0,73 | | | 0,31 | | | 0,66 | 0,61 | 0,56 | 0,22 | | | 0,19 | 0,22 | 0,22 | 0,86 | 1,37 | 1,99 | 3,71 |
| | R90 | | 0,64 | | | 0,29 | | | 0,25 | 0,13 | - [1] | 0,13 | | | 0,10 | 0,10 | 0,10 | 0,62 | 0,99 | 1,44 | 2,68 |
| | R120 | | 0,59 | | | 0,28 | | | - [1] | - [1] | - [1] | - [1] | | | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] |
| **with lever arm** | | | | | | | | | | | | | | | | | | | | | |
| $M^0_{Rk,s,fi}$ | R30 | [Nm] | 0,83 | 1,05 | 1,27 | 0,33 | 0,42 | 0,50 | 1,09 | 1,40 | 1,71 | 0,32 | 0,40 | 0,48 | 0,29 | 0,39 | 0,54 | 1,12 | 2,26 | 3,95 | 10,0 |
| | R60 | | 0,74 | 0,93 | 1,13 | 0,31 | 0,39 | 0,47 | 0,67 | 0,78 | 0,86 | 0,22 | 0,28 | 0,34 | 0,19 | 0,28 | 0,34 | 0,87 | 1,77 | 3,20 | 7,87 |
| | R90 | | 0,65 | 0,82 | 0,99 | 0,29 | 0,37 | 0,44 | 0,26 | 0,17 | - [1] | 0,13 | 0,16 | 0,20 | 0,10 | 0,12 | 0,15 | 0,63 | 1,28 | 2,24 | 5,69 |
| | R120 | | 0,60 | 0,76 | 0,92 | 0,28 | 0,35 | 0,43 | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] | - [1] |
| **General installation Parameters** | | | | | | | | | | | | | | | | | | | | | |
| Edge distance and spacing | $c_{cr,fi}$ | [mm] | 100 | | | 60 | | | 80 | | | 80 | | | 100 | | | 200 | | | |
| | $s_{cr,fi}$ | | 320 | | | 200 | | | 520 | | | 340 | | | 520 | | | 400 | | | |

[1] No performance assessed.

[2] $V_{Rk,b,fi} = N_{Rk,b,fi}$

[3] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

In absence of national regulations, the recommended partial factor $\gamma_{M,fi} = 1,0$.

Injection system Selkent SEL-V+ for masonry

**Performance**
Characteristic values under tension and shear loading under fire exposure (single anchor)

**Annex C124**

Deutsches Institut für Bautechnik DIBt

## Characteristic values under tension loading under fire exposure (anchor group)

**Table C125.1:** Characteristic values under tension loading under fire exposure; brick breakout failure [3)]

| Brick | Mean compressive strength / Min. comp. strength single brick [2)] | $h_{ef}$ | Spacing | M8 | | | | M10 | | | | M12 | | | | M16 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $N^{g}_{Rk,b,fi(90)}$ | | $N^{g}_{Rk,b,fi(120)}$ | | $N^{g}_{Rk,b,fi(90)}$ | | $N^{g}_{Rk,b,fi(120)}$ | | $N^{g}_{Rk,b,fi(90)}$ | | $N^{g}_{Rk,b,fi(120)}$ | | $N^{g}_{Rk,b,fi(90)}$ | | $N^{g}_{Rk,b,fi(120)}$ | |
| **No. of anchors in a group:** | | | | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** | **2** | **4** |
| [-] | [N/mm²] | [mm] | [-] | [kN] | | | | | | | | | | | | | | | |
| Solid brick MZ, NF acc. to Annex C4 | ≥ 15 / ≥ 12 | ≥ 80 | $s_{cr,fi}$ ∥ | 1,1 | 2,1 | 0,8 | 1,7 | 1,3 | 2,5 | 1,0 | 2,0 | 1,5 | 2,9 | 1,2 | 2,4 | - [1)] | | | |
| | | | $s_{cr,fi}$ ⊥ | 1,4 | | 1,1 | | 1,7 | | 1,3 | | 2,0 | | 1,6 | | | | | |
| Solid calcium silicate brick KS, NF, acc. to Annex C14 | ≥ 15 / ≥ 12 | ≥ 50 | $s_{cr,fi}$ ∥ | 0,3 | 0,6 | 0,2 | 0,5 | 0,3 | 0,6 | 0,2 | 0,5 | 0,3 | 0,6 | 0,2 | 0,5 | - [1)] | | | |
| | | | $s_{cr,fi}$ ⊥ | 0,9 | | 0,7 | | 0,9 | | 0,7 | | 0,9 | | 0,7 | | | | | |
| Perforated calcium silicate brick KSL, acc. to Annex C24 | ≥ 10 / ≥ 8 | ≥ 130 | $s_{cr,fi}$ ∥ | 1,4 | 2,7 | 1,1 | 2,2 | 1,4 | 2,7 | 1,1 | 2,2 | 1,4 | 2,7 | 1,1 | 2,2 | - [1)] | | | |
| | | | $s_{cr,fi}$ ⊥ | 1,8 | | 1,5 | | 1,8 | | 1,5 | | 1,8 | | 1,5 | | | | | |
| Vertical perforated brick HLz, acc. to Annex C30 | ≥ 7,5 / ≥ 6 | ≥ 85 | $s_{cr,fi}$ ∥ | 0,4 | 0,9 | 0,4 | 0,7 | 0,4 | 0,9 | 0,4 | 0,7 | 0,5 | 1,1 | 0,4 | 0,9 | - [1)] | | | |
| | | | $s_{cr,fi}$ ⊥ | 0,4 | | 0,4 | | 0,4 | | 0,4 | | 0,5 | | 0,4 | | | | | |
| Vertical perforated brick HLz, acc. to Annex C28 | ≥ 5 / ≥ 4 | ≥ 130 | $s_{cr,fi}$ ∥ | 0,4 | 0,4 | 0,3 | 0,3 | 0,4 | 0,4 | 0,3 | 0,3 | 0,5 | 0,5 | 0,4 | 0,4 | - [1)] | | | |
| | | | $s_{cr,fi}$ ⊥ | 0,4 | | 0,3 | | 0,4 | | 0,3 | | 0,5 | | 0,4 | | | | | |
| Autoclaved aerated concrete acc. to Annex C118 | **Anchor rod** | | | **M8** | | | | **M10** | | | | **M12** | | | | **M16** | | | |
| | ≥ 2,5 / ≥ 2 | ≥ 100 | $s_{cr,fi}$ ∥ | 1,1 | 2,1 | 0,8 | 1,7 | 1,1 | 2,1 | 0,8 | 1,7 | 1,1 | 2,1 | 0,8 | 1,7 | 1,4 | 2,8 | 1,1 | 2,2 |
| | | | $s_{cr,fi}$ ⊥ | 1,1 | | 0,8 | | 1,1 | | 0,8 | | 1,1 | | 0,8 | | 1,4 | | 1,1 | |
| | **Selkent internal threaded anchor E** | | | **11x85 M8** | | | | **15x85 M10** | | | | **15x85 M12** | | | | - | | | |
| | ≥ 2,5 / ≥ 2 | ≥ 85 | $s_{cr,fi}$ ∥ | 0,9 | 1,8 | 0,7 | 1,4 | 0,9 | 1,8 | 0,7 | 1,4 | 0,9 | 1,8 | 0,7 | 1,4 | - [1)] | | | |
| | | | $s_{cr,fi}$ ⊥ | 0,9 | | 0,7 | | 0,9 | | 0,7 | | 0,9 | | 0,7 | | | | | |

[1)] No performance assessed.

[2)] The minimum compressive strength of the single brick must not be less than 80% of the mean compressive strength.

[3)] All other proofs have to be conducted with the single anchor in accordance with TR 054.

In absence of national regulations, the recommended partial factor $\gamma_{M,fi} = 1,0$.

Injection system Selkent SEL-V+ for masonry

**Performance**
Characteristic values under tension loading under fire exposure (anchor group)

**Annex C125**

Deutsches Institut für Bautechnik DIBt

## Spacing and edge distance under fire exposure (anchor group)

**Table C126.1:** Spacing and Edge distance under fire exposure, brick breackout failure

**Solid brick MZ, NF acc. to Annex C4**
mean compressive strength / Min. compressive strength single brick ≥ 15 / ≥ 12 N/mm²

| Anchor rod | | | M8 | | M10 | | M12 | |
|---|---|---|---|---|---|---|---|---|
| Effective anchorage depth | $h_{ef}$ | [mm] | 80 | 200 | 80 | 200 | 80 | 200 |
| Characteristic spacing | $s_{cr,fi}$ ∥ | | 80 | 320 | 80 | 320 | 80 | 320 |
| | $s_{cr,fi}$ ⊥ | | 100 | 100 | 100 | 100 | 100 | 100 |
| Edge distance | $c_{cr,fi}$ | | 160 | 400 | 160 | 400 | 160 | 400 |

**Solid calcium silicate brick KS, NF, acc.to Annex C14**
mean compressive strength / Min. compressive strength single brick ≥ 15 / ≥ 12 N/mm²

| Anchor rod | | | M8 | | M10 | | M12 | |
|---|---|---|---|---|---|---|---|---|
| Effective anchorage depth | $h_{ef}$ | [mm] | 50 | 100 | 50 | 200 | 50 | 200 |
| Characteristic spacing | $s_{cr,fi}$ ∥ | | 107 | 107 | 107 | 107 | 107 | 107 |
| | $s_{cr,fi}$ ⊥ | | 200 | 400 | 200 | 800 | 200 | 800 |
| Edge distance | $c_{cr,fi}$ | | 100 | 200 | 100 | 400 | 100 | 400 |

**Perforated calcium silicate brick KSL, acc. to Annex C24**
mean compressive strength / Min. compressive strength single brick ≥ 10 / ≥ 8 N/mm²

| Anchor rod / perforated sleeve | | | M8 / 16x130 | M10 / 16x130 | M12 / 20x130 |
|---|---|---|---|---|---|
| Effective anchorage depth | $h_{ef}$ | [mm] | 130 | 130 | 130 |
| Characteristic spacing | $s_{cr,fi}$ ∥ | | 133 | 133 | 133 |
| | $s_{cr,fi}$ ⊥ | | 153 | 153 | 153 |
| Edge distance | $c_{cr,fi}$ | | 260 | 260 | 260 |

**Vertical perforated brick HLz, acc. to Annex C30**
mean compressive strength / Min. compressive strength single brick ≥ 7,5 / ≥ 6 N/mm²

| Anchor rod / perforated sleeve | | | M8 / 16x85 | M10 / 16x85 | M12 / 20x85 |
|---|---|---|---|---|---|
| Effective anchorage depth | $h_{ef}$ | [mm] | 85 | 85 | 85 |
| Characteristic spacing | $s_{cr,fi}$ ∥ | | 320 | 320 | 320 |
| | $s_{cr,fi}$ ⊥ | | 153 | 153 | 153 |
| Edge distance | $c_{cr,fi}$ | | 170 | 170 | 170 |

**Vertical perforated brick HLz, acc. to Annex C28**
mean compressive strength / Min. compressive strength single brick ≥ 5 / ≥ 4 N/mm²

| Anchor rod / perforated sleeve | | | M8 / 16x130 | M10 / 16x130 | M12 / 20x130 |
|---|---|---|---|---|---|
| Effective anchorage depth | $h_{ef}$ | [mm] | 130 | 130 | 130 |
| Characteristic spacing | $s_{cr,fi}$ ∥ | | 133 | 133 | 133 |
| | $s_{cr,fi}$ ⊥ | | 133 | 133 | 133 |
| Edge distance | $c_{cr,fi}$ | | 260 | 260 | 260 |

Injection system Selkent SEL-V+ for masonry

**Performance**
Spacing and edge distance under fire esposure (anchor group)

**Annex C126**

Deutsches Institut für Bautechnik DIBt

## Spacing and edge distance under fire exposure (anchor group)

**Table C127.1:** Spacing and Edge distance under fire exposure, brick breackout failure

**Autoclaved aerated concrete acc. to Annex C118**
mean compressive strength / Min. compressive strength single brick ≥ 2,5 / ≥ 2 N/mm²

| **Anchor rod** | | | **M8** | | **M10** | | **M12** | | **M16** | |
|---|---|---|---|---|---|---|---|---|---|---|
| Effective anchorage depth | $h_{ef}$ | [mm] | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 |
| Characteristic spacing | $s_{cr,fi}$ ∥ | | 333 | 107 | 333 | 107 | 333 | 107 | 333 | 107 |
| | $s_{cr,fi}$ ⊥ | | 333 | 107 | 333 | 107 | 333 | 107 | 333 | 107 |
| Edge distance | $c_{cr,fi}$ | | 200 | 400 | 200 | 400 | 200 | 400 | 200 | 400 |

**Autoclaved aerated concrete acc. to Annex C118**
mean compressive strength / Min. compressive strength single brick ≥ 2,5 / ≥ 2 N/mm²

| **Selkent internal threaded anchor E** | | | **11x85 M8** | **15x85 M10** | **15x85 M12** |
|---|---|---|---|---|---|
| Effective anchorage depth | $h_{ef}$ | [mm] | 85 | 85 | 85 |
| Characteristic spacing | $s_{cr,fi}$ ∥ | | 333 | 333 | 333 |
| | $s_{cr,fi}$ ⊥ | | 333 | 333 | 333 |
| Edge distance | $c_{cr,fi}$ | | 170 | 170 | 170 |

Injection system Selkent SEL-V+ for masonry

**Performance**
Spacing and edge distance under fire esposure (anchor group)

**Annex C127**