We are one team. We are Leviat.

Leviat is the new name of CRH’s construction accessories companies worldwide.

Under the Leviat brand, we are uniting the expertise, skills and resources of HALFEN and its sister companies to create a world leader in fixing, connecting and anchoring technology.

The products you know and trust, including HALFEN HCC Column shoe, will remain an integral part of Leviat’s comprehensive brand and product portfolio. As Leviat, we can offer you an extended range of specialist products and services, greater technical expertise, a larger and more agile supply chain and better, faster innovation.

By bringing together CRH’s construction accessories family as one global organisation, we are better equipped to meet the needs of our customers, and the demands of construction projects, of any scale, anywhere in the world.

This is an exciting change. Join us on our journey.

Read more about Leviat at Leviat.com
Our product brands include:

- Ancon
- HALFEN
- PLAKA

60 locations

sales in 30+ countries

3000 people worldwide


Leviat.com
HALFEN COLUMN SHOE SYSTEM

Introduction

The better solution for connecting precast columns

HALFEN HCC Column shoe combined with HALFEN HAB Anchor bolts

These days, there’s a significantly more economical way to assemble precast columns. The new HALFEN HCC Column shoe provides a convenient solution for connection to foundations or for linking columns together. One advantage of the prefabricated system with screw connection is its rapid assembly. The connection is simple to adjust and immediately load bearing. This means no assembly braces are necessary and crane occupancy is optimised.

The system comprises the HCC Column shoe and the respective HAB Anchor bolts for the anchoring base. The principle: The column shoes are set into the precast columns, the anchor bolts into the foundation on site, using a template. During assembly, the elements are connected together mechanically using nuts.

In the final step the remaining recesses and the foot of the column are filled with low-shrink seal mortar.

Column connection, designed for normal force and bending moment loads.

Application

- Arrangement in the column
- Fitting the HALFEN HAB Anchor bolts.
  The anchor bolts must be fitted exactly according to the position and arrangement specified in the design drawings. The use of a fitting template is recommended to ensure that the anchor bolts are exactly located according to dimensions; and to prevent displacement during concreting and compacting.
  Fitting templates → page 13.
- Mounting the precast columns
  Adjust vertically, align, screw tight, cast the joint → page 13.

Dimensioning software for structural design and type selection → pages 4-5
HALFEN COLUMN SHOE SYSTEM
Column shoe combinations, product variants

**HCC Column shoe, combined with single HAB Anchor bolts**

Special forms such as bent or angled anchor bolts are available on request.

**HCC-M Column shoe, combined with multiple HAB Anchor bolts**

Special forms such as bent or angled anchor bolts are available on request.

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A user-friendly software is available for the selection and dimensioning of the required HAB Anchor bolts and HCC Column shoes. It allows the calculation of the loads of the HALFEN HCC Column shoes for both the conditions during assembly and the final state.

With the help of the module for double bending combined with axial force the maximum load on the column shoe is determined. The software also calculates the anchoring of the HAB Anchor bolts according to the official approvals. The selection of the anchor diameter can be effected automatically or by preselection.

Screen for entering data about position, dimensions of the structural members, edge distances and the concrete strengths, of the column and the foundation. During the input the appropriate auxiliary texts are displayed in the status bar.

Input screen to consider impacts during assembly, with the following options:
automatic calculation with wind load and dead load;
calculation with input of the applicable loads.
HALFEN COLUMN SHOE SYSTEM
Dimensioning software

HCC Column shoes, HAB Anchor bolts

All impacts for the load case ‘final state’ can be entered here. The load cases for design loads can be defined individually. Alternatively 2 input assistants are available, which are useful for generating any combination of permanent and variable loads or for any load cases, which can be defined fully out of limits.

The total number of anchor bolts and the arrangement within the bolt group can be chosen as well as the type of anchor bolt. Additional concrete cover can be set. The load group can be preselected or determined by the software.

After completion of the calculation, the status for all values is displayed individually. The results can be checked on screen. The position of the neutral line is displayed. Of course the detailed results, and a parts list for the whole project can be printed on any common printer.
HALFEN COLUMN SHOE SYSTEM

Column shoe type HCC
HALFEN HCC Column shoe

HALFEN Column shoes type HCC are connection parts to form rigid column connections and joints. The rigid connection is effective both during assembly and in the final state. The internal forces which occur are passed into the anchorage base by the HALFEN Anchor bolts HAB-H (headed anchor bolts) or HAB-S (straight anchor bolts).

<table>
<thead>
<tr>
<th>Type selection HCC</th>
<th>Article no.</th>
<th>Dimensions, fitting measurements [mm]</th>
<th>Weight [kg/piece]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item name</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCC d3– L Ø</td>
<td>0950.010</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>HCC 16 – 640</td>
<td>00001</td>
<td>80</td>
<td>87</td>
</tr>
<tr>
<td>HCC 20 – 830</td>
<td>00002</td>
<td>90</td>
<td>95</td>
</tr>
<tr>
<td>HCC 24 – 905</td>
<td>00003</td>
<td>100</td>
<td>106</td>
</tr>
<tr>
<td>HCC 30 – 1100</td>
<td>00004</td>
<td>115</td>
<td>119</td>
</tr>
<tr>
<td>HCC 39 – 1450</td>
<td>00005</td>
<td>145</td>
<td>157</td>
</tr>
</tbody>
</table>

Load bearing capacity HCC

<table>
<thead>
<tr>
<th>Item name</th>
<th>Suitable anchor bolts:</th>
<th>Design value tensile stress $N_{td}$ [kN]</th>
<th>Max. eccentricity $e$ assembly tolerance [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCC d3– L Ø</td>
<td>with headed anchor bolt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCC 16 – 640</td>
<td>HABH16</td>
<td>61.7</td>
<td>± 5</td>
</tr>
<tr>
<td>HCC 20 – 830</td>
<td>HABH20</td>
<td>96.3</td>
<td>± 5</td>
</tr>
<tr>
<td>HCC 24 – 905</td>
<td>HABH24</td>
<td>138.7</td>
<td>± 5</td>
</tr>
<tr>
<td>HCC 30 – 1100</td>
<td>HABH30</td>
<td>220.4</td>
<td>± 5</td>
</tr>
<tr>
<td>HCC 39 – 1450</td>
<td>HABH39</td>
<td>383.4</td>
<td>± 8</td>
</tr>
</tbody>
</table>

① for column concrete ≥ C30/37 acc. to type test certificate. Additional reinforcement and execution of the lap-over joint for column reinforcement → page 12
② Length L for ’good’ anchorage conditions (incl. 1.0 × $f_{bd}$, VB 1). Also available for ’poor’ anchorage conditions on request (incl. 0.7 × $f_{bd}$).
③ Dimension B corresponds to the height of the recess body → page 12.

When designing the column connection, the basic conditions of type test certificate no. 03.30 (for HCC and HCC-M) and approvals Z-21.5-1761 (for HAB-H) and Z.21.5-1758 (for HAB-MH) must be taken into consideration.
HALFEN provides the HCC dimensioning software as a working aid → page 4-5.

TECHNICAL CONSULTATION
We are represented with sales offices and distributors worldwide. Please contact us: www.halfen.com → refer to catalogue rear cover.

Materials, standards

<table>
<thead>
<tr>
<th>Base plate, side plates</th>
<th>S355J2, DIN EN 10025-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforcement steel</td>
<td>BSt 5005, DIN 488-1; (B500B)</td>
</tr>
</tbody>
</table>
HALFEN COLUMN SHOE SYSTEM

Column shoe type HCC-M

HALFEN Column shoes type HCC-M are connecting parts to form rigid column connections for higher stressed construction members. The rigid connection is effective both during assembly and in the final state. The internal forces which occur are passed into the anchorage base by the HALFEN Anchor bolts HAB-MH (headed anchor bolts) or HAB-MS (straight anchor bolts).

**Type selection HCC-M**

<table>
<thead>
<tr>
<th>Item name</th>
<th>Article no.</th>
<th>Dimensions, fitting measurements [mm]</th>
<th>Weight [kg/piece]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCC-M30 – 1200</td>
<td>00006</td>
<td>B 125 134 220 50 30 173 45 45 1050 50 165</td>
<td>18.5</td>
</tr>
<tr>
<td>HCC-M36 – 1650</td>
<td>00007</td>
<td>C 155 157 245 60 37 195 55 50 1000 55 165</td>
<td>29.0</td>
</tr>
<tr>
<td>HCC-M39 – 1650</td>
<td>00008</td>
<td>D 175 172 267 60 37 210 55 55 1000 55 185</td>
<td>40.5</td>
</tr>
<tr>
<td>HCC-M45 – 2070</td>
<td>00009</td>
<td>E 175 207 317 60 37 246 65 60 1460 65 195</td>
<td>69.0</td>
</tr>
<tr>
<td>HCC-M52 – 2290</td>
<td>00010</td>
<td>F 175 232 366 60 35 280 70 70 1450 70 240</td>
<td>95.0</td>
</tr>
</tbody>
</table>

**Load bearing capacity HCC-M**

<table>
<thead>
<tr>
<th>Item name</th>
<th>Suitable anchor bolts:</th>
<th>Design value tensile stress N_{Ed,s} [kN]</th>
<th>Max. eccentricity assembly tolerance e [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCC-M30 – 1200</td>
<td>HAB-MH30-(36) HAB-MS30-(36)</td>
<td>299  ± 4.5</td>
<td></td>
</tr>
<tr>
<td>HCC-M36 – 1650</td>
<td>HAB-MH36w HAB-MS36</td>
<td>436  ± 9.5</td>
<td></td>
</tr>
<tr>
<td>HCC-M39 – 1650</td>
<td>HAB-MH39 HAB-MS39</td>
<td>520  ± 8</td>
<td></td>
</tr>
<tr>
<td>HCC-M45 – 2070</td>
<td>HAB-MH45 HAB-MS45</td>
<td>696  ± 10</td>
<td></td>
</tr>
<tr>
<td>HCC-M52 – 2290</td>
<td>HAB-MH52 HAB-MS52</td>
<td>937  ± 9</td>
<td></td>
</tr>
</tbody>
</table>

1. for column concrete ≥ C30/37 acc. to type test certificate.
2. Additional reinforcement and execution of the lap-over joint for column reinforcement → page 12
3. Length L for ‘good’ anchorage conditions (incl. 1.0 × f_{bd}). Also available for ‘poor’ anchorage conditions on request (incl. 0.7 × f_{bd}).
4. Dimension B corresponds to the height of the recess body → page 12.

When designing the column connection, the basic conditions of type test certificate no. 03.30 (for HCC and HCC-M) and approvals Z-21.5-1761 (for HAB-H) and Z.21.5-1758 (for HAB-MH) must be taken into consideration.

We provide the HCC dimensioning software as a working aid → page 4-5.

TECHNICAL CONSULTATION

HALFEN is represented with sales offices and distributors worldwide. Please contact us: www.halfen.com → refer to catalogue rear cover.
HALFEN Anchor bolts type HAB-H are made of reinforcement steel Bst 500S with rolled thread. Anchoring is achieved by the forged head (headed anchor bolt). The shallow installation depth required for the anchor bolts type HAB-H makes them particularly suitable for anchoring work in large-area components such as foundations or walls with sufficiently large edge distances.

### Load bearing capacity HAB-H

<table>
<thead>
<tr>
<th>Item name</th>
<th>Article no.</th>
<th>Length [mm]</th>
<th>Installation depth [mm]</th>
<th>Thread-length [mm]</th>
<th>Anchor bar diameter [mm]</th>
<th>Thread diameter [mm]</th>
<th>Weight [kg/piece]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAB-H16</td>
<td>00001</td>
<td>280</td>
<td>175</td>
<td>105</td>
<td>16</td>
<td>16</td>
<td>0.7</td>
</tr>
<tr>
<td>HAB-H20</td>
<td>00002</td>
<td>350</td>
<td>235</td>
<td>115</td>
<td>20</td>
<td>20</td>
<td>1.2</td>
</tr>
<tr>
<td>HAB-H24</td>
<td>00003</td>
<td>430</td>
<td>300</td>
<td>130</td>
<td>25</td>
<td>24</td>
<td>2.2</td>
</tr>
<tr>
<td>HAB-H30</td>
<td>00004</td>
<td>500</td>
<td>350</td>
<td>150</td>
<td>32</td>
<td>30</td>
<td>4.0</td>
</tr>
<tr>
<td>HAB-H39</td>
<td>00005</td>
<td>700</td>
<td>535</td>
<td>165</td>
<td>40</td>
<td>39</td>
<td>9.0</td>
</tr>
</tbody>
</table>

① for concrete ≥ C20/25 and applications in connection with HALFEN HCC Column shoe (→ page 6) according to Approval Z-21.5-1761.

Please enquire about load bearing features for other applications to our sales offices and distributors worldwide. Please contact us: www.halfen.com → refer to catalogue rear cover.

The proof of anchorage in concrete, must be produced according to approval Z-21.5-1761 geometry and structure of the anchorage base taking into account.

We provide the HCC software (current version) for dimensioning → page 4-5.
HALFEN Anchor bolts type HAB-MH are made from 2 to 4 headed reinforcement bars which are factory welded to a threaded high-strength steel stud. The shallow installation depth required for the anchor bolts type HAB-MH makes them particularly suitable for anchoring work in large-area components such as foundations or walls with sufficiently large edge distances.

### Type selection HAB-MH

<table>
<thead>
<tr>
<th>Item name</th>
<th>Article no.</th>
<th>Length [l] [mm]</th>
<th>Installation depth [l2] [mm]</th>
<th>Thread-length [l3] [mm]</th>
<th>No. and diam. anch. bars [d1] [mm]</th>
<th>Thread diameter [d3] [mm]</th>
<th>Weight [kg/piece]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAB-MH30-(36)</td>
<td>00003</td>
<td>755</td>
<td>575</td>
<td>165</td>
<td>4, Ø 20</td>
<td>36</td>
<td>9.5</td>
</tr>
<tr>
<td>HAB-MH36</td>
<td>00004</td>
<td>755</td>
<td>575</td>
<td>165</td>
<td>4, Ø 20</td>
<td>36</td>
<td>10.0</td>
</tr>
<tr>
<td>HAB-MH39</td>
<td>00005</td>
<td>880</td>
<td>695</td>
<td>185</td>
<td>3, Ø 25</td>
<td>39</td>
<td>13.0</td>
</tr>
<tr>
<td>HAB-MH45</td>
<td>00006</td>
<td>980</td>
<td>785</td>
<td>195</td>
<td>4, Ø 25</td>
<td>45</td>
<td>19.0</td>
</tr>
<tr>
<td>HAB-MH52</td>
<td>00007</td>
<td>1160</td>
<td>900</td>
<td>240</td>
<td>4, Ø 32</td>
<td>52</td>
<td>34.5</td>
</tr>
</tbody>
</table>

### Load bearing capacity HAB-MH

<table>
<thead>
<tr>
<th>Item name</th>
<th>Tension/compression capacity [Nrd,s] [kN]</th>
<th>Transverse pull capacity [Vrd,s] [kN]</th>
<th>Bending load capacity [M0rk,s] [Nm]</th>
<th>To be observed: minimum centre spacing [s] [mm]</th>
<th>minimum edge distance [c] [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAB-MH30-(36)</td>
<td>436*</td>
<td>235*</td>
<td>3160*</td>
<td>160</td>
<td>140</td>
</tr>
<tr>
<td>HAB-MH36</td>
<td>436</td>
<td>235</td>
<td>3160</td>
<td>160</td>
<td>140</td>
</tr>
<tr>
<td>HAB-MH39</td>
<td>520</td>
<td>280</td>
<td>4130</td>
<td>180</td>
<td>150</td>
</tr>
<tr>
<td>HAB-MH45</td>
<td>696</td>
<td>376</td>
<td>6390</td>
<td>200</td>
<td>160</td>
</tr>
<tr>
<td>HAB-MH52</td>
<td>937</td>
<td>506</td>
<td>9980</td>
<td>280</td>
<td>180</td>
</tr>
</tbody>
</table>

* Values for bolts as HAB-MH36

Please enquire about load bearing features for other applications to our sales offices and distributors worldwide. Please contact us: www.halfen.com refer to catalogue rear cover.

The proof of anchorage in concrete, must be produced according to Approval Z-21.5-1758 geometry and structure of the anchorage base taking into account. We provide the HCC software (current version) for dimensioning refer to page 4-5.
HALFEN COLUMN SHOE SYSTEM

Anchor bolts

Straight anchor bolt type HAB-S

HALFEN Anchor bolts HAB-S are made of reinforcement steel grade BSt 500S with rolled thread. Anchorage is made by overlapping joint or anchoring according to reinforced concrete standards, enabling minimum centre spacings and edge distances. HAB-S Anchor bolts are also available with bent or angled end on request.

<table>
<thead>
<tr>
<th>Item name</th>
<th>Article no.</th>
<th>Length l [mm]</th>
<th>Installation depth l2 [mm]</th>
<th>Thread length l3 [mm]</th>
<th>Anchor bar diameter d1 [mm]</th>
<th>Thread diameter d3 [mm]</th>
<th>Weight [kg/piece]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAB-S16</td>
<td>00001</td>
<td>970</td>
<td>865</td>
<td>105</td>
<td>16</td>
<td>16</td>
<td>1.7</td>
</tr>
<tr>
<td>HAB-S20</td>
<td>00002</td>
<td>1170</td>
<td>1055</td>
<td>115</td>
<td>20</td>
<td>20</td>
<td>3.1</td>
</tr>
<tr>
<td>HAB-S24</td>
<td>00003</td>
<td>1360</td>
<td>1230</td>
<td>130</td>
<td>25</td>
<td>24</td>
<td>5.6</td>
</tr>
<tr>
<td>HAB-S30</td>
<td>00004</td>
<td>1660</td>
<td>1510</td>
<td>150</td>
<td>32</td>
<td>30</td>
<td>11.0</td>
</tr>
<tr>
<td>HAB-S39</td>
<td>00005</td>
<td>1980</td>
<td>1815</td>
<td>165</td>
<td>40</td>
<td>39</td>
<td>20.5</td>
</tr>
</tbody>
</table>

Load bearing capacity HAB-H

<table>
<thead>
<tr>
<th>Item name</th>
<th>Tension/ compression capacity N_{Rd,s} [kN]</th>
<th>Transverse pull capacity V_{Rd,s} [kN]</th>
<th>Bending load capacity M_{Rk,s} [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAB-S16</td>
<td>61.7</td>
<td>26</td>
<td>182</td>
</tr>
<tr>
<td>HAB-S20</td>
<td>96.3</td>
<td>40</td>
<td>357</td>
</tr>
<tr>
<td>HAB-S24</td>
<td>138.7</td>
<td>58</td>
<td>617</td>
</tr>
<tr>
<td>HAB-S30</td>
<td>220.4</td>
<td>92</td>
<td>1237</td>
</tr>
<tr>
<td>HAB-S39</td>
<td>383.4</td>
<td>160</td>
<td>2778</td>
</tr>
</tbody>
</table>

Order example:
Anchor bolt Type HAB-S20 article no. 0951.020-00002 and the suitable column shoe Type HCC 20-830 article no. 0950.010-00002

Combination with column shoe

HALFEN Anchor bolts type HAB-S are made of reinforcement steel grade BSt 500S with rolled thread. Anchorage is made by overlapping joint or anchoring according to reinforced concrete standards, enabling minimum centre spacings and edge distances. HAB-S Anchor bolts are also available with bent or angled end on request.

Load bearing capacity HAB-H

Anchorage acc. to DIN 1045-1 or EC2

Order example:
Anchor bolt Type HAB-S20 article no. 0951.020-00002 and the suitable column shoe Type HCC 20-830 article no. 0950.010-00002

Combination with column shoe

HALFEN Anchor bolts type HAB-S are made of reinforcement steel grade BSt 500S with rolled thread. Anchorage is made by overlapping joint or anchoring according to reinforced concrete standards, enabling minimum centre spacings and edge distances. HAB-S Anchor bolts are also available with bent or angled end on request.

Load bearing capacity HAB-H

Anchorage acc. to DIN 1045-1 or EC2

Order example:
Anchor bolt Type HAB-S20 article no. 0951.020-00002 and the suitable column shoe Type HCC 20-830 article no. 0950.010-00002

Combination with column shoe

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Load bearing capacity HAB-H

Anchorage acc. to DIN 1045-1 or EC2

Order example:
Anchor bolt Type HAB-S20 article no. 0951.020-00002 and the suitable column shoe Type HCC 20-830 article no. 0950.010-00002

Combination with column shoe

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Load bearing capacity HAB-H

Anchorage acc. to DIN 1045-1 or EC2

Order example:
Anchor bolt Type HAB-S20 article no. 0951.020-00002 and the suitable column shoe Type HCC 20-830 article no. 0950.010-00002

Combination with column shoe

HALFEN Anchor bolts type HAB-S are made of reinforcement steel grade BSt 500S with rolled thread. Anchorage is made by overlapping joint or anchoring according to reinforced concrete standards, enabling minimum centre spacings and edge distances. HAB-S Anchor bolts are also available with bent or angled end on request.

Load bearing capacity HAB-H

Anchorage acc. to DIN 1045-1 or EC2

Order example:
Anchor bolt Type HAB-S20 article no. 0951.020-00002 and the suitable column shoe Type HCC 20-830 article no. 0950.010-00002

Combination with column shoe
HALFEN COLUMN SHOE SYSTEM

Anchor bolts

**Straight anchor bolt type HAB-MS**

HALFEN HAB-MS Anchor bolt, including 2 nuts + 2 washers

HALFEN HAB-MS Anchor bolts are made from 2 to 4 ribbed reinforcement bars which are factory welded to a threaded high-strength steel stud. The anchorage is made by overlapping joint or anchoring according to the reinforced concrete standards. This enables minimum centre spacings and edge distances. HAB-MS Anchor bolts are also available with bent or angled bars on request.

<table>
<thead>
<tr>
<th>Item name</th>
<th>Article no.</th>
<th>Length</th>
<th>Installation depth</th>
<th>Thread-length</th>
<th>No. and diam. anch. bars</th>
<th>Thread diameter</th>
<th>Weight [kg/piece]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAB-MS30-(36)</td>
<td>00003</td>
<td>1430</td>
<td>1265</td>
<td>165</td>
<td>4, Ø20</td>
<td>36</td>
<td>15.5</td>
</tr>
<tr>
<td>HAB-MS36</td>
<td>00004</td>
<td>1430</td>
<td>1265</td>
<td>165</td>
<td>4, Ø20</td>
<td>36</td>
<td>16.0</td>
</tr>
<tr>
<td>HAB-MS39</td>
<td>00005</td>
<td>1600</td>
<td>1415</td>
<td>185</td>
<td>3, Ø25</td>
<td>39</td>
<td>21.0</td>
</tr>
<tr>
<td>HAB-MS45</td>
<td>00006</td>
<td>1800</td>
<td>1605</td>
<td>195</td>
<td>4, Ø25</td>
<td>45</td>
<td>31.5</td>
</tr>
<tr>
<td>HAB-MS52</td>
<td>00007</td>
<td>1910</td>
<td>1670</td>
<td>240</td>
<td>4, Ø32</td>
<td>52</td>
<td>52.0</td>
</tr>
</tbody>
</table>

**Load bearing capacity HAB-MS**

<table>
<thead>
<tr>
<th>Item name</th>
<th>Tension/compression capacity $N_{Rd,k}$ [kN]</th>
<th>Transverse pull capacity $V_{Rd,k}$ [kN]</th>
<th>Bending load capacity $M_{Rd,k}$ [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAB-MS30-(36)</td>
<td>436*</td>
<td>235*</td>
<td>3160*</td>
</tr>
<tr>
<td>HAB-MS36</td>
<td>436</td>
<td>235</td>
<td>3160</td>
</tr>
<tr>
<td>HAB-MS39</td>
<td>520</td>
<td>280</td>
<td>4130</td>
</tr>
<tr>
<td>HAB-MS45</td>
<td>696</td>
<td>376</td>
<td>6390</td>
</tr>
<tr>
<td>HAB-MS52</td>
<td>937</td>
<td>506</td>
<td>9980</td>
</tr>
</tbody>
</table>

Anchorage acc. to DIN 1045-1 or EC2

① for concrete ≥ C20/25 and applications in connection with HALFEN Column shoe HCC-M (→ page 7).

* Values for bolts as HAB-MS36

Please enquire about load bearing features for other applications to our sales offices and distributors worldwide. Please contact us: www.halfen.com → refer to catalogue rear cover.

We provide the dimensioning software HCC as a working aid for the anchorage proof in concrete using straight bar ends, see → pages 4-5.

<table>
<thead>
<tr>
<th>Materials, standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anchor bolts</strong></td>
</tr>
<tr>
<td>• Bar diam. d1 16 to 25 mm: reinforcement steel BSt 500S, DIN 488-1; (B500 B)</td>
</tr>
<tr>
<td>• Bar diam. d1 ≥ 32: reinforcement steel BSt 500S, acc. to general official approval; (B500 B)</td>
</tr>
<tr>
<td><strong>Threaded component</strong></td>
</tr>
<tr>
<td><strong>Hexagon nuts</strong></td>
</tr>
<tr>
<td>Strength grade 10, DIN EN 20898-2</td>
</tr>
<tr>
<td><strong>Washers</strong></td>
</tr>
<tr>
<td>S355J0, DIN EN 10025-2</td>
</tr>
</tbody>
</table>

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HALFEN COLUMN SHOE SYSTEM

Application

Fitting the HCC Column shoes into the formwork

Recess former for column corner HCCA1
Recess former for column edge HCCA2

Order example: Fixing set ‘HCC-Fix’ type 16
Order no. 0952.090-00001

Order example: Recess former type HCC-A2-16
Order no. 0952.020-00001

Additional reinforcement example

Stirrup for column shoe
Stirrup in the joint area
Stirrup for column shoe bar
Longitudinal reinforcement in the corner area

Additional stirrups in the column shoe area

<table>
<thead>
<tr>
<th>Column shoe</th>
<th>Anchor bolt</th>
<th>⌀ 1</th>
<th>⌀ 2</th>
<th>⌀ 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCC - 16</td>
<td>HAB-H16 / HAB-S16</td>
<td>1 Ø 8</td>
<td>8 Ø 8</td>
<td>1 Ø 8</td>
</tr>
<tr>
<td>HCC - 20</td>
<td>HAB-H20 / HAB-S20</td>
<td>1 Ø 10</td>
<td>10 Ø 10</td>
<td>1 Ø 10</td>
</tr>
<tr>
<td>HCC - 24</td>
<td>HAB-H24 / HAB-S24</td>
<td>1 Ø 10</td>
<td>10 Ø 10</td>
<td>1 Ø 10</td>
</tr>
<tr>
<td>HCC - 39</td>
<td>HAB-H39 / HAB-S39</td>
<td>2 Ø 12</td>
<td>12 Ø 12</td>
<td>2 Ø 12</td>
</tr>
<tr>
<td>HCC -M30</td>
<td>HAB-H30/M39</td>
<td>2 Ø 10</td>
<td>10 Ø 10</td>
<td>2 Ø 10</td>
</tr>
<tr>
<td>HCC -M36</td>
<td>HAB-M36</td>
<td>2 Ø 12</td>
<td>12 Ø 12</td>
<td>2 Ø 12</td>
</tr>
<tr>
<td>HCC -M39</td>
<td>HAB-M39</td>
<td>2 Ø 12</td>
<td>12 Ø 12</td>
<td>2 Ø 12</td>
</tr>
<tr>
<td>HCC -M45</td>
<td>HAB-M45</td>
<td>3 Ø 12</td>
<td>12 Ø 12</td>
<td>3 Ø 12</td>
</tr>
<tr>
<td>HCC -M52</td>
<td>HAB-M52</td>
<td>3 Ø 12</td>
<td>12 Ø 12</td>
<td>3 Ø 12</td>
</tr>
</tbody>
</table>
HALFEN COLUMN SHOE SYSTEM

Application

Installing HAB Anchor bolts

Fitting template
The most practical way to fit the HAB Anchor bolts into the concrete formwork is the use of a fitting template. The template is used to screw the individual bolts into the concrete formwork at the same height with the 2 nuts and washers provided, they are then aligned correctly to axis and vertically, and secured against displacement during the concreting process. The template is reusable.

Application example

Fitting template: Sturdy welded steel structure: dimensions and number of positioning sleeves according to order specifications.

Assembly cap
The steel assembly cap protects the thread of the anchor bolt from damage during assembly.

<table>
<thead>
<tr>
<th>Assembly caps</th>
<th>suitable to d3</th>
<th>article no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item name</td>
<td>[mm]</td>
<td></td>
</tr>
<tr>
<td>HCC-MKA – 16</td>
<td>16</td>
<td>00001</td>
</tr>
<tr>
<td>HCC-MKA – 20</td>
<td>20</td>
<td>00002</td>
</tr>
<tr>
<td>HCC-MKA – 24</td>
<td>24</td>
<td>00003</td>
</tr>
<tr>
<td>HCC-MKA – 30</td>
<td>30</td>
<td>00004</td>
</tr>
<tr>
<td>HCC-MKA – 36</td>
<td>36</td>
<td>00005</td>
</tr>
<tr>
<td>HCC-MKA – 39</td>
<td>39</td>
<td>00006</td>
</tr>
<tr>
<td>HCC-MKA – 45</td>
<td>45</td>
<td>00007</td>
</tr>
<tr>
<td>HCC-MKA – 52</td>
<td>52</td>
<td>00008</td>
</tr>
</tbody>
</table>

Installing the precast column

1 Column

- Attach the column shoe to the head plate of the formwork.

2 Foundation

- Fit the anchor bolts into the foundation formwork using the template.

3 Column:
- Remove the template, insert the assembly plates, put the assembly caps in place.
- Set the column down.
- Remove the assembly caps, screw the top nuts with the washers onto the anchor bolts.
- Adjust and calibrate the column.
- Tighten the nuts. A defined turning moment is not required.

4 The column is connected force-locked with the foundation (assembly state).
- The dimensions of the recesses allow the use of ring type slugging wrenches.
- The foot of the column and the recesses must be filled with low-shrink seal mortar e.g. HALFEN HLB-MIX according to the mortar manufacturer’s specification.
- Mortar strength at least column concrete strength.

- This filling process can take place via a casting pipe inserting into the column or a casting pocket on the concrete formwork.
- The joint mortar has to be filled at one side only in order to guarantee complete and even casting without any hollow spaces.
Application examples

Coupling of precast reinforced concrete columns

HALFEN HCC Column shoes are also used for continuous columns which can be prepared as precast parts independently from the floors. The precast reinforced concrete columns are one storey high, the connection between the columns is rigid using HALFEN Column shoes and anchor bolts.

Filling the joint at column base with seal mortar

The mortar joint under the column is made of low-shrink seal mortar of at least the same strength class as the concrete column. The full final load bearing capacity is only given if this casting process is followed.

HALFEN seal mortar HLB-MIX is available in 25 kg bags.

article no. 0058.060-00001
HALFEN COLUMN SHOE SYSTEM

Application

On the construction site: fast and safe assembly using the HALFEN Column shoe system

The anchor bolts are cast into the foundation at the exact position, using a fitting template, and . . .

The concrete columns, fitted with the HALFEN Column shoes, are supplied to the site ready-to-assemble.

HALFEN Column shoes ensure an efficient installation process, . . .

. . . structurally efficient connections, and . . .

. . . the column can be set up directly on the foundation, once the concrete is cured.

. . . interfering assembly braces are redundant.
Innovative engineered products and construction solutions that allow the industry to build safer, stronger and faster.
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