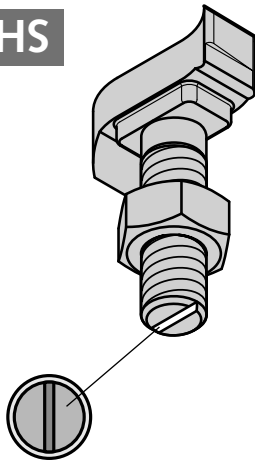
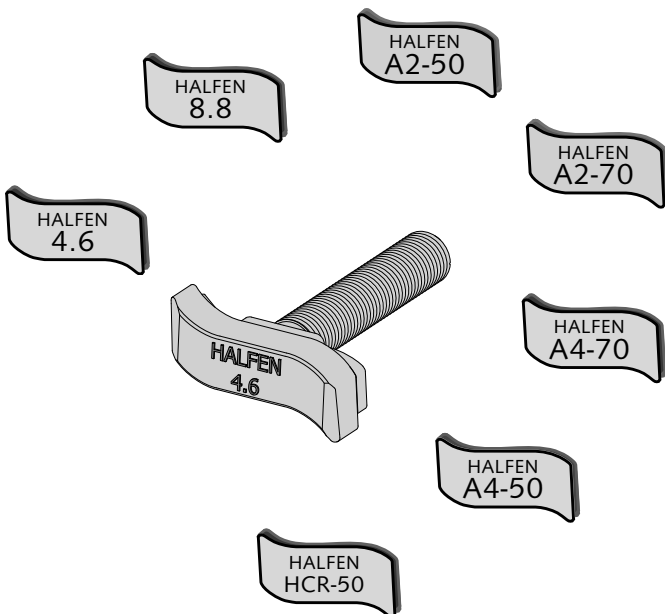


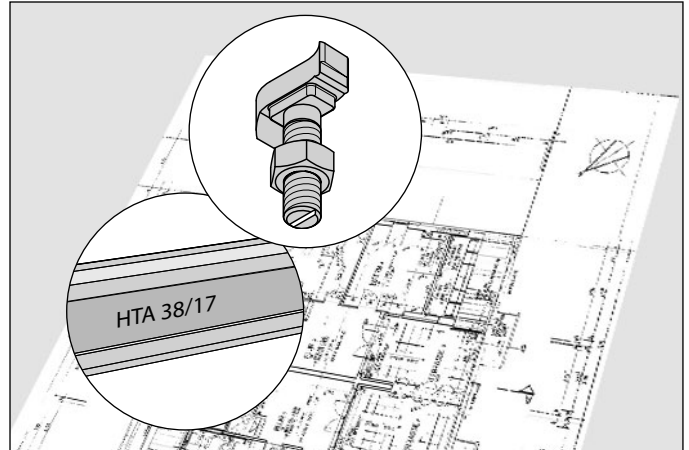
**HS**



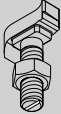
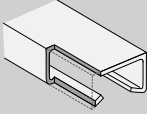
**Identification - steel grade and property class**

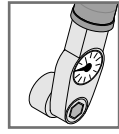


**Combination bolt - channel**



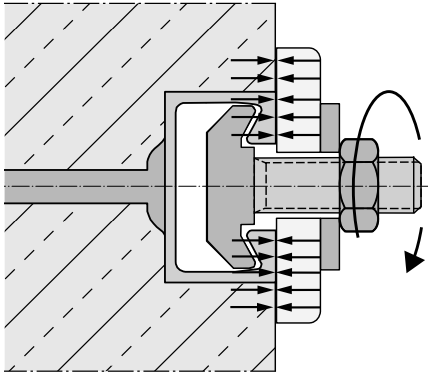
**HS**

|  |   |
|--|---|
| <b>HS 72/48</b>  | HTA 72/48; HM 72/48<br>HTA 72/49  |
| <b>HS 50/30</b>  | HTA 55/42; HM 55/42<br>HTA 52/34; HM 52/34<br>HTA 54/33<br>HTA 50/30; HTA 50/30P; HM 50/30<br>HTA 49/30; HM 49/30<br>HM 50/40; HL 50/40<br>HM 486 |
| <b>HS 40/22</b>  | HTA 40/22; HTA 40/22P; HM 40/22<br>HTA 40/25; HM 40/25<br>HM 422  |
| <b>HS 41/41</b>  | HM 41/41; HL 41/41; HLL 41/41<br>HM 41/62; HL 41/62<br>HM 41/83; HL 41/83<br>HM 41/22; HL 41/22; HLL 41/22  |
| <b>HS 38/17</b>  | HTA 38/17; HM 38/17<br>HM 36/36; HL 36/36<br>(HZM 38/23)  |
| <b>HS 29/20</b>  | (HZM 29/20)   |
| <b>HS 28/15</b>  | HTA 28/15; HM 28/15; HL 28/15<br>HM 28/28; HL 28/28<br>HM 26/26; HL 26/26   |
| <b>HS 20/12</b>  | HM 20/12; HL 20/12  |

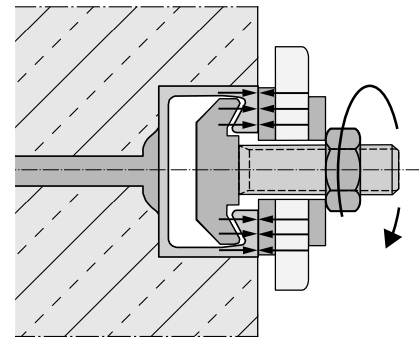


Installation torque

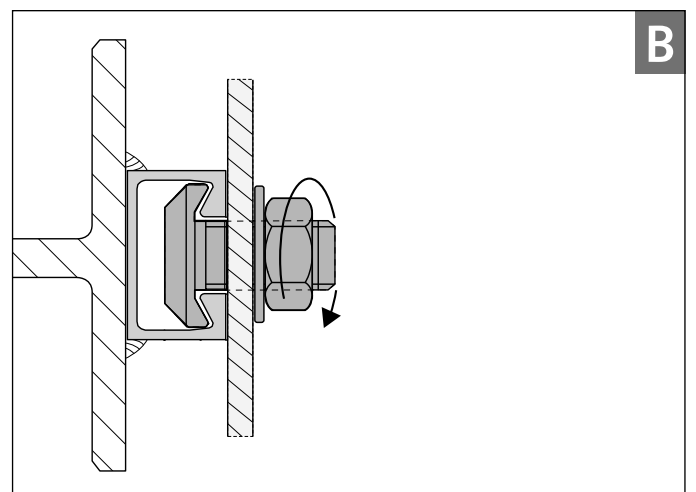
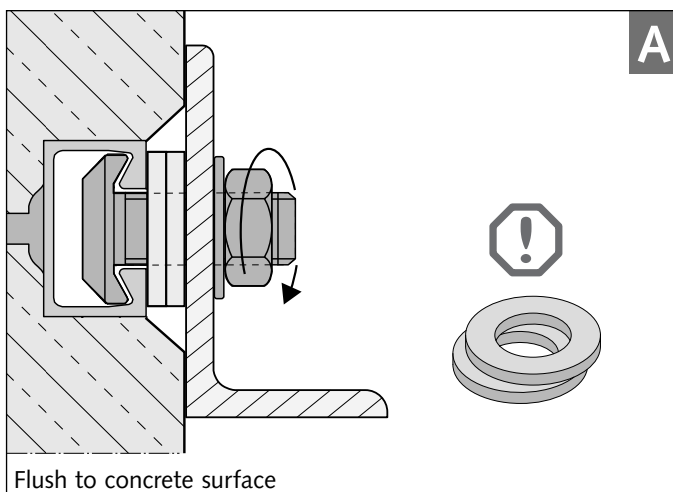
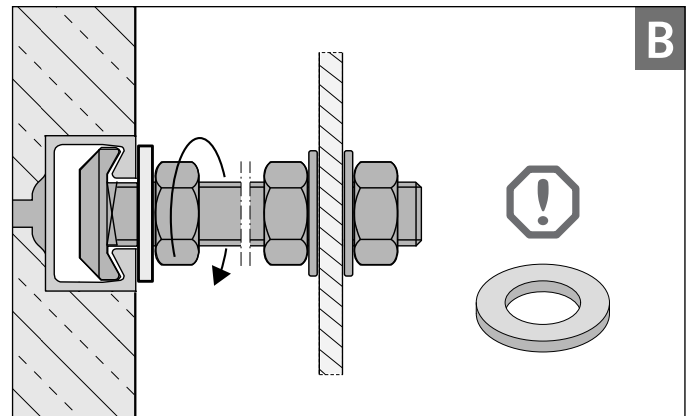
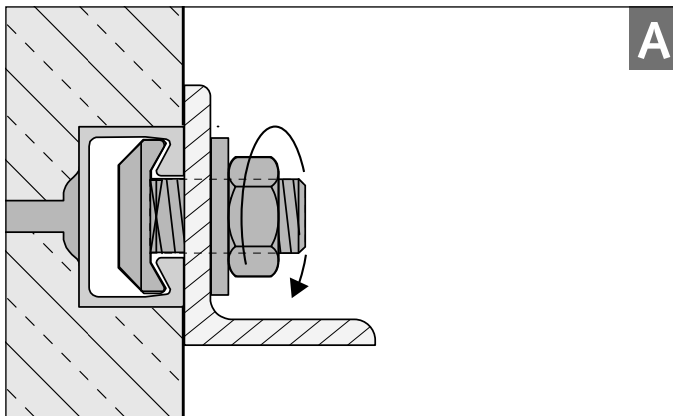
**A** Steel to concrete





**B** Steel to steel



Variants



Flush to concrete surface

|                               |                        |  |              |    |     |     |     |     |     |     |     |     |
|-------------------------------|------------------------|---|--------------|----|-----|-----|-----|-----|-----|-----|-----|-----|
| lbf.ft                        |                        |  | M6           | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |     |
| <b>A</b><br>Steel to concrete | 4.6<br>8.8<br>50<br>70 | 28/15   | 2            | 5  | 9   | 12  | -   | -   | -   | -   | -   |     |
|                               |                        | 38/17   | -            | -  | 10  | 14  | 30  | -   | -   | -   | -   |     |
|                               |                        | 40/22, 40/25  | -            | -  | 11  | 18  | 48  | -   | -   | -   | -   |     |
|                               |                        | 50/30, 49/30  | -            | -  | 11  | 18  | 48  | 85  | -   | -   | -   |     |
|                               |                        | 52/34, 54/33  | -            | -  | 11  | 18  | 48  | 100 | -   | -   | -   |     |
|                               |                        | 55/42   | -            | -  | 11  | 18  | 48  | 100 | 170 | -   | -   |     |
|                               |                        | 72/48, 72/49  | -            | -  | -   | -   | -   | 100 | 170 | 251 | 339 |     |
| <b>B</b><br>Steel to steel    | 4.6                    | 28/15   | 2            | 5  | 10  | 13  | -   | -   | -   | -   | -   |     |
|                               |                        | 38/17   | -            | -  | 12  | 17  | 44  | -   | -   | -   | -   |     |
|                               |                        | 40/22, 40/25  | -            | -  | 12  | 21  | 48  | -   | -   | -   | -   |     |
|                               |                        | 50/30, 49/30, 52/34, 54/33  | -            | -  | 12  | 21  | 52  | 100 | -   | -   | -   |     |
|                               |                        | 55/42   | -            | -  | 12  | 21  | 52  | 100 | 170 | -   | -   |     |
|                               |                        |   | 72/48, 72/49 | -  | -   | -   | -   | -   | 100 | 170 | 251 | 339 |
|                               | 8.8                    | 28/15   | -            | 16 | 30  | -   | -   | -   | -   | -   | -   | -   |
|                               |                        | 38/17   | -            | -  | -   | 48  | 100 | -   | -   | -   | -   | -   |
|                               |                        | 40/22, 40/25  | -            | -  | 30  | 55  | 136 | -   | -   | -   | -   | -   |
|                               |                        | 50/30, 49/30, 52/34, 54/33  | -            | -  | 30  | 55  | 136 | 266 | -   | -   | -   | -   |
|                               |                        | 55/42   | -            | -  | 30  | 55  | 136 | 266 | 461 | -   | -   | -   |
|                               |                        |   | 72/48, 72/49 | -  | -   | -   | -   | -   | 266 | 461 | 664 | -   |
|                               | 50                     | 28/15   | -            | 5  | 9   | -   | -   | -   | -   | -   | -   | -   |
|                               |                        | 38/17   | -            | -  | -   | 14  | 33  | -   | -   | -   | -   | -   |
|                               |                        | 40/22, 40/25  | -            | -  | 11  | 20  | 45  | -   | -   | -   | -   | -   |
|                               |                        | 50/30, 49/30, 52/34, 54/33  | -            | -  | 11  | 20  | 45  | 90  | -   | -   | -   | -   |
|                               |                        | 72/48, 72/49  | -            | -  | -   | -   | -   | 90  | 150 | -   | -   | -   |
|                               | 70                     | 28/15   | -            | 11 | 22  | -   | -   | -   | -   | -   | -   | -   |
|                               |                        | 38/17   | -            | -  | 22  | 30  | -   | -   | -   | -   | -   | -   |
|                               |                        | 40/22, 40/25  | -            | -  | 22  | 35  | 95  | -   | -   | -   | -   | -   |
|                               |                        | 50/30, 49/30, 52/34, 54/33  | -            | -  | 22  | 35  | 95  | 185 | -   | -   | -   | -   |
|                               |                        | 72/48, 72/49  | -            | -  | -   | -   | -   | 185 | 325 | -   | -   | -   |

**General notes**



**Note:** The T-head bolts used for HALFEN Channels must display the manufacturers marking "H" or "HALFEN". The use of any other bolts is not admissible.

**Notch marking:**

HALFEN Bolts are marked with notches at the shaft end, first to identify the bolt (HS-bolts have one notch) and second to verify proper installation.

After tightening the bolt, the notch must be perpendicular to the longitudinal channel axis.

**Identification:**

Property classes and steel grades are embossed into the bolt head.

**Stainless steel definition:**

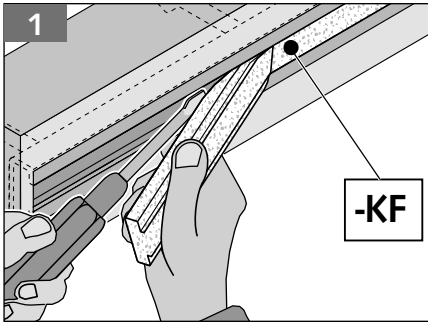
**A4:** Corrosion category III acc. to Z-30.3-6, or acc. to EN 1993-1-4:2006, table A.1, row 3 (1.4362, 1.4401, 1.4571...).

**A2:** Corrosion category II acc. to Z-30.3-6, or acc. to EN 1993-1-4:2006, table A.1, row 2 (1.4301, 1.4311, 1.4307...).

**HCR:** Corrosion category IV and V acc. to Z-30.3-6, or acc. to EN 1993-1-4:2006 (1.4529...).

**Combination bolt - channel:**

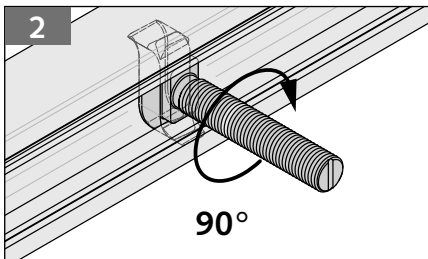
Selection by table or according to the planning documentation.



Note: Only use HALFEN Bolts in combination with the hexagon-nuts which are supplied together with the bolts.

**Sequence of assembly**

- 1 Remove foam filler (code KF) from channel.
- 2 Insert the HALFEN Bolts into the channel slot. Turn 90° clockwise to lock the HALFEN Bolt in position. (Check whether the notch is perpendicular to the channel longitudinal axis)



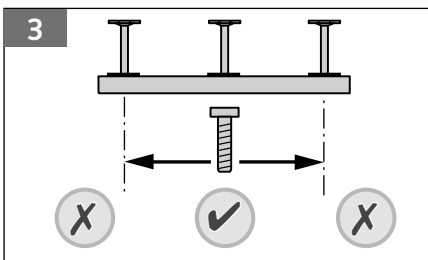
**Shimming in case of recessed cast-in channel:**

If the face of the channel is recessed from the concrete surface (e.g. due to insufficient fixing to the formwork), then shims must be used between the face of the channel and the back of the component to create a flush surface. Note: the admissible bending moment of the HALFEN Bolt must not be exceeded.

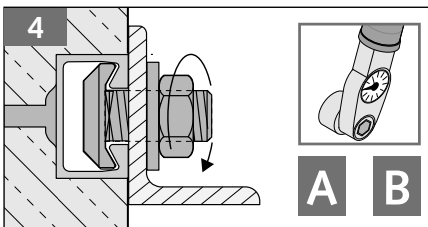


**Shimming for stand-off assembly:**

Washers type US or VUS should always be used under the nut, in particular, when tightening the hex nut directly against the channel face. Use lockwashers type SIC to prevent HALFEN Bolts from loosening.



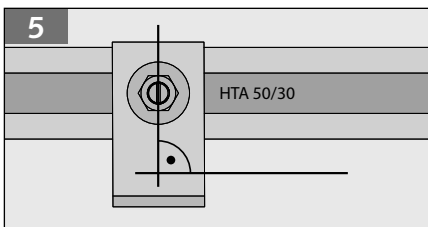
- 3 Position of the bolts: installation of HALFEN Bolts in the excess length of the channels is not allowed.



- 4 Always use the specified installation torque  $T_{inst}$  for your construction. The installation torques depend on bolt type, bolt size, channel type and assembly variant. Refer to the planning documentation or engineer's specification. The installation torques are shown in the provided tables.

**Assembly variants:**

- A** Steel to concrete    **B** Steel to steel



- 5 After tightening the nut, check whether the T-bolt is properly installed. If the notch is not perpendicular to the longitudinal channel axis, the T-bolt must be completely loosened, re-aligned and re-tightened. Finally re-check the orientation of the notch is now correct.



Installation torque values apply only to bolts in delivery condition (unlubricated).

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