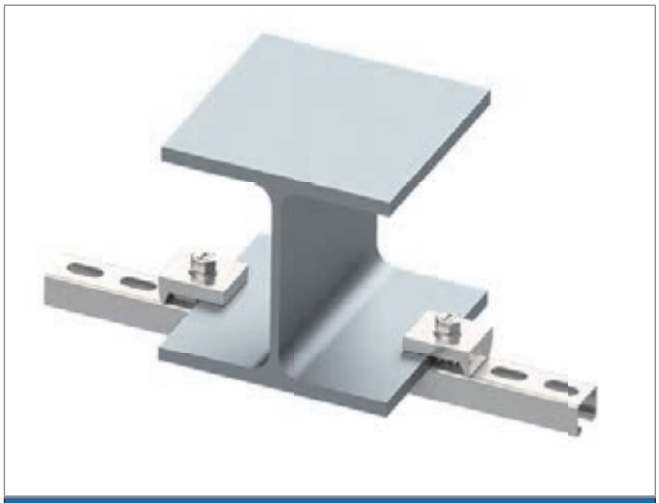
# ACCESSORIES
# The benefits at a glance

**You can design nearly all connections in buildings and industrial plants with Halfen Channels. With Cast-in channels or framing channels, Halfen Bolts and with our wide range of accessories we provide fastenings for all purposes.**



KLP Rail clips

Application example with Halfen KLP Rail clips

### Fast and cost-effective

- 3-dimensional adjustable connection when used with cast-in channels
- uses bolts instead of welding
- simple assembly reduces installation time

VBM Coupler sleeve

Connect nearly everything with a VBM Coupler sleeve

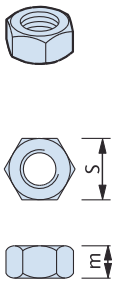
**Further accessories for construction and industrial design**
The Halfen Framing system (industrial) product range can be found in the following catalogues:
**Halfen Flexible bolt connections, Halfen Flexible framing connections or Halfen Powerclick System.**

e.g. channel rings, cantilever arms, pipe clamps

e.g. threaded locking plates

# ACCESSORIES
## Nuts and Washers

### MU
Hexagonal nuts EN ISO 4032/ DIN 934



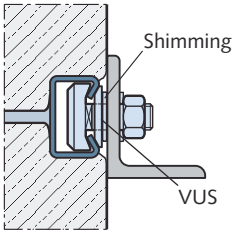

| GV galvanized FK 8 thread | A4 stainless steel Bolt | S/m DIN [mm] | S/m ISO [mm] |
|---|---|---|---|
| M6 | M6 | 10/5 | 10/5.2 |
| M8 | M8 | 13/6.5 | 13/6.8 |
| M10 | M10 | 17/8 | 16/ 8.4 |
| M12 | M12 | 19/10 | 18/10.8 |
| M16 | M16 | 24/13 | 24/14.8 |
| M20 | M20 | 30/16 | 30/18 |
| M24 | – | 36/19 | 36/21.5 |
| **FV hot-dip galvanized thread** | **A2 stainless steel Bolt** | **S/m DIN [mm]** | **S/m ISO [mm]** |
| M6 | – | 10/5 | 10/5.2 |
| M8 | M8 | 13/6.5 | 13/6.8 |
| M10 | M10 | 17/8 | 16/8.4 |
| M12 | M12 | 19/10 | 18/10.8 |
| M16 | M16 | 24/13 | 24/14.8 |

### VUS
Square washers

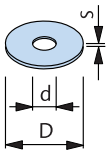
| FV Hot-dip galvanized Bolt size | A4 Stainless steel Bolt size | a × b × d [mm] |
|---|---|---|
| **VUS 40/25** for profile 40/25; HZA 41/22 | | |
| **M10** | **M10** | 40 × 40 × 5 |
| **M12** | **M12** | 40 × 40 × 5 |
| **M16** | **M16** | 40 × 40 × 5 |
| **VUS 49/30** for profile 54/33, 49/30 | | |
| **M10** | **M10** | 37 × 37 × 5 |
| **M12** | **M12** | 37 × 37 × 5 |
| **M16** | **M16** | 37 × 37 × 5 |
| **M20** | **M20** | 37 × 37 × 5 |
| **VUS 52/34** for profile 52/34, 50/30 | | |
| **M16** | **M16** | 50 × 50 × 6 |
| **M20** | **M20** | 50 × 50 × 6 |
| **VUS 72/49** for profile 72/48, 72/49 | | |
| **M20** | **M20** | 54 × 54 × 6 |
| **M24** | **M24** | 54 × 54 × 6 |
| **M27** | **M27** | 54 × 54 × 6 |
| **M30** | **M30** | 54 × 54 × 6 |
| **VUS 41/41** for all 41/.. profiles | | |
| **M6** | **M6** | 40 × 40 × 6 |
| **M10** | **M10** | 40 × 40 × 6 |
| **M12** | **M12** | 40 × 40 × 6 |

Ordering example: **VUS 52/34 - FV - M20**

**Application VUS:**
for shimming non-flush installation of Halfen Anchor channels or for stand-off installations
→ see page 40.



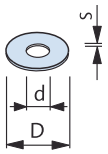

### US
Washers DIN EN ISO 7093/ DIN 9021; DIN EN ISO 7094




| DIN/ ISO | GV galvanized, bolt | A4 stainless steel bolt | D [mm] | d [mm] | s [mm] |
|---|---|---|---|---|---|
| 7094 | **M6** | – | 22 | 6.6 | 2 |
| 9021 | **M8** | **M8** | 24 | 8.4 | 2 |
| 9021 | **M10** | **M10** | 30 | 10.5 | 2.5 |
| 7094 | **M12** | – | 45 | 13.5 | 4 |
| 9021 | **M12** | **M12** | 37 | 13 | 3 |
| 9021 | **M16** | **M16** | 50 | 17 | 3 |
| 7094 | **M20** | – | 72 | 22 | 6 |
| | **FV** hot-dip galv. bolt | | D [mm] | d [mm] | s [mm] |
| 9021 | **M10** | – | 30 | 10.5 | 2.5 |
| 9021 | **M12** | – | 37 | 13 | 3 |
| 9021 | **M16** | – | 50 | 17 | 3 |

Ordering example: **US - M12 - GV - DIN 9021**

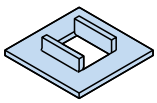
### US
Washers DIN EN ISO 7089/ DIN 125




| GV galvanized bolt | A4 Stainless steel bolt | D [mm] | d [mm] | s [mm] |
|---|---|---|---|---|
| **M6** | **M6** | 12 | 6.4 | 1.6 |
| **M8** | **M8** | 16 | 8.4 | 1.6 |
| **M10** | **M10** | 21 | 10.5 | 2 |
| **M12** | **M12** | 24 | 13 | 2.5 |
| **M16** | **M16** | 30 | 17 | 3 |
| **M20** | **M20** | 37 | 21 | 3 |
| **M24** | – | 44 | 25 | 4 |
| **FV** Hot-dip galvanized | **A2** Stainless steel bolt | D [mm] | d [mm] | s [mm] |
| – | **M8** | 17 | 8.4 | 1.6 |
| **M10** | **M10** | 21 | 10.5 | 2 |
| **M12** | **M12** | 24 | 13 | 2.5 |
| **M16** | **M16** | 30 | 17 | 3 |
| **M20** | – | 37 | 21 | 3 |
| **M27** | – | 50 | 28 | 4 |

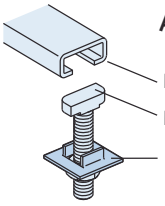
Ordering example: **US - M12 - GV - DIN 125**

### SIC
Locking washer



| GV galvanized | A4 Stainless steel A4 | Suitable for Halfen bolts Type | Dimensions |
|---|---|---|---|
| **SIC - 50/30 - GV** | **SIC - 50/30 - A4** | 50/30 | M16, M20 |
| **SIC - 40/22 - GV** | **SIC - 40/22 - A4** | 38/17 40/22 | M16 |
| **SIC - 38/23 - GV** | – | 38/23 | M16 |
| **SIC - 29/20 - GV** | – | 29/20 | M12 |
| **SIC - 38/17 - GV** | **SIC - 38/17 - A4** | 38/17 40/22 | M12, M10 |
| **SIC - 28/15 - GV** | **SIC - 28/15 - A4** | 28/15 | M8, M10 |
| **SIC - 20/12 - GV** | **SIC - 20/12 - A4** | 20/12 | M8 |

Ordering example: **SIC - 38/17 - GV**




**Assembly:**

**Application SIC:**
to secure and prevent Halfen Bolts back-turning during assembly.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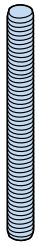
# ACCESSORIES
## Threaded rods, Hexagonal head bolts, Coupler sleeves, Ring nuts

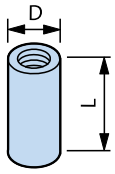
### GWS
Threaded rods
DIN 976-1



| GV Galvanized F.k. 4.6 Thread | A4 Stainless steel A4 Thread | Length [mm] | $F_{Rd}$ ① [kN] | allow. F [kN] |
|---|---|---|---|---|
| M6 | M6 | 1000 | 3.1 | 2.2 |
| M8 | M8 | 1000 | 5.6 | 4.0 |
| M10 | M10 | 1000 | 9.0 | 6.4 |
| M12 | M12 | 1000 | 13.0 | 9.3 |
| M16 | M16 | 1000 | 24.2 | 17.3 |
| M20 | M20 | 1000 | 37.8 | 27.0 |
| M24 | – | 1000 | 54.3 | 38.8 |

Ordering example: **GWS - M12 × 1000 - GV**

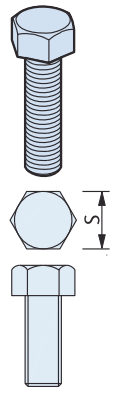
### VBM
Coupler sleeves, round




| GV Galvanized Thread | A4 Stainless steel Thread | D [mm] | L [mm] | $F_{Rd}$ ① [kN] | allow. F [kN] |
|---|---|---|---|---|---|
| M6 | M6 | 10/10 | 15 | 3.1 | 2.2 |
| M8 | M8 | 12/14 | 20 | 5.6 | 4.0 |
| M10 | M10 | 13/16 | 25 | 9.0 | 6.4 |
| M12 | M12 | 16/20 | 30 | 13.0 | 9.3 |
| M16 | M16 | 21/25 | 40 | 24.2 | 17.3 |
| M20 | M20 | 26/32 | 50 | 37.8 | 27.0 |

Ordering example: **VBM - A4 - M16**

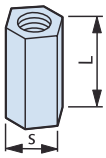
### HSK
Hexagonal head bolts
EN ISO 4017/
DIN 933
(without nut)




Hex bolts are used in combination with Halfen Locking plates

| GV 8.8 Galvanized FK 8.8 Dimensions | A4 Stainless steel Dimensions | S DIN [mm] | S EN ISO [mm] |
|---|---|---|---|
| M 6 × 12 | – | 10 | 10 |
| M 6 × 25 | – | | |
| M 8 × 25 | M8 × 25 | 13 | 13 |
| M 8 × 40 | – | | |
| M 10 × 20 | – | 17 | 16 |
| M 10 × 30 | M10 × 30 | | |
| M 10 × 45 | M10 × 45 | | |
| M 10 × 60 | – | | |
| M 10 × 70 | – | | |
| M 12 × 22 | – | 19 | 18 |
| M 12 × 25 | M12 × 25 | | |
| M 12 × 30 | M12 × 30 | | |
| M 12 × 40 | M12 × 40 | | |
| M 12 × 50 | – | | |
| M 12 × 60 | M12 × 60 | | |
| M 12 × 80 | M12 × 80 | | |
| M 12 × 90 | – | | |
| M 16 × 40 | M16 × 40 | 24 | 24 |
| M 16 × 60 | M16 × 60 | | |
| M 16 × 90 | M16 × 90 | | |

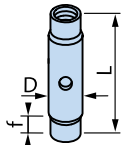
### SKM
Hexagonal coupler sleeves




| FV Hot-dip galvanized Thread | A4 Stainless steel Thread | S [mm] | L [mm] | $F_{Rd}$ ① [kN] | allow. F [kN] |
|---|---|---|---|---|---|
| M10 | M10 | 17 | 40 | 9.0 | 6.4 |
| M12 | M12 | 19 | 40 | 13.0 | 9.3 |
| M16 | M16 | 24 | 50 | 24.2 | 17.3 |

Ordering example: **SKM - FV - M12**

### SPH
Turnbuckles with right- and left-hand thread

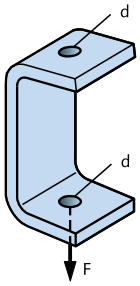



f = min. screw depth
M12 ≙ 10mm
M16 ≙ 13 mm

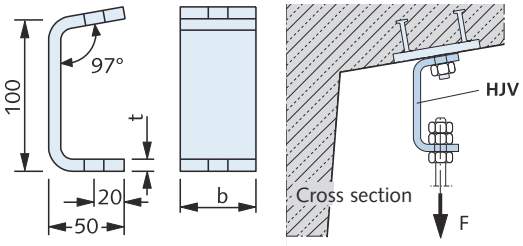
| A4 Stainless steel Thread M12 × Length L [mm] | A4 Stainless steel Thread M16 × Length L [mm] | D For M12 [mm] | D For M16 [mm] |
|---|---|---|---|
| M 12 × 60 | M 16 × 60 | 16 | 22 |
| M 12 × 75 | M 16 × 75 | 16 | 22 |
| M 12 × 95 | M 16 × 95 | 16 | 22 |
| M 12 × 115 | M 16 × 115 | 16 | 22 |
| M 12 × 135 | M 16 × 135 | 16 | 22 |
| allow. F = 5 kN $F_{Rd}$ = 7 kN | allow. F = 10 kN $F_{Rd}$ = 14 kN | | |

Ordering example: **SPH - A4 - M12 x 75**

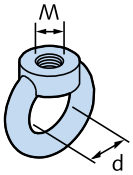
### HJV
Adjustment coupler




| FV Hot-dip galvanized Type | A4 Stainless steel Type | t [mm] | b [mm] | d [mm] | max. $F_{Ed}$ ② [kN] | allow. F [kN] |
|---|---|---|---|---|---|---|
| 1 | 1 | 6 | 40 | 13 | 2.1 | 1.5 |
| 2 | 2 | 8 | 50 | 17 | 4.6 | 3.3 |
| 3 | 3 | 10 | 50 | 17 | 7.0 | 5 |




### RM
Ring nut
DIN 582
from 2010-09




| GV C 15E, galvanized Thread | d [mm] | $F_{Rd}$ ① [kN] | allow. F [kN] |
|---|---|---|---|
| M8 | 20 | 2.0 | 1.4 |
| M10 | 25 | 3.2 | 2.3 |
| M12 | 30 | 4.8 | 3.4 |
| M16 | 35 | 9.8 | 7.0 |
| M20 | 40 | 16.8 | 12.0 |

Ordering example: **RM - GV - M12**

① Recommended design value of the load capacity with a centric tensile stress

② Recommended design value of the load

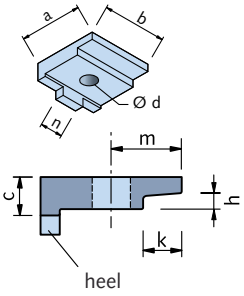
# ACCESSORIES
## Rail Clips

### KLP-S Rail clips, steel 1.0038 forged

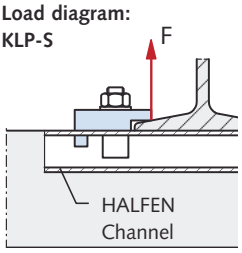
| FV hot-dip galvanized | Heel width n | for Halfen Bolts | Dimensions [mm] | | | | | | | Allowable load at σ allowable = 125 N/mm² | Preferred for use with | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Standard profile I | other beam, flange thickness channels | channels |
| Type | [mm] | Ø × l [mm] | a | b | c | Ø d | h | k | m | F [kN] | | t [mm] | |
| No. 10 | 16 | M16 × 60 | 44.0 | 45 | 12 | 18 | 5 | 12.0 | 22.0 | 3.5 | 80 – 140 | 4 – 6 | S24 |
| No. 26 | without heel | M16 × 60 | 62.5 | 64 | 21 | 18 | 9 | 16.5 | 34.5 | 3.5 | 160 – 240 | 7 – 9 | S24, A45, A55 |
| No. 20 | 20 | M20 × 65 | 52.0 | 55 | 19 | □ 21 | 8 | 15.0 | 24.0 | 10.0 | 160 – 240 | 7 – 9 | S24 – S49 |

Ordering example: **KLP - S - Nr. 26 - FV**

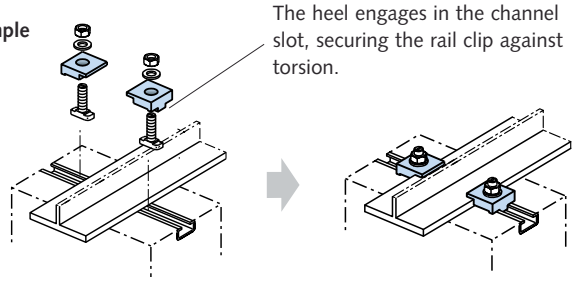
□ = square opening




**Load diagram: KLP-S**




**Assembly example KLP-S**



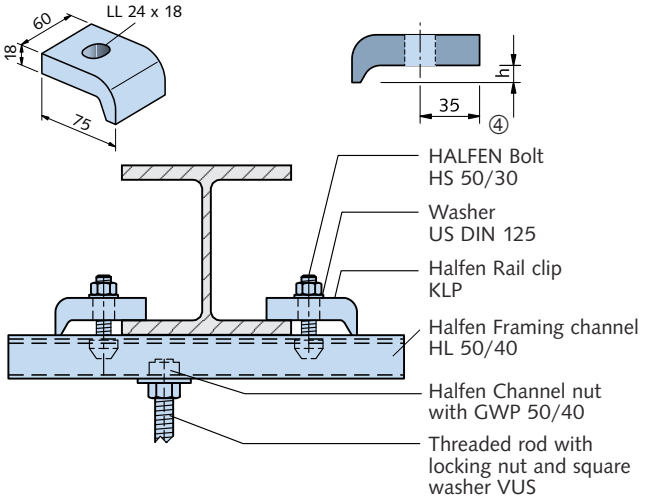
The heel engages in the channel slot, securing the rail clip against torsion.

### KLP - 60 Rail clips

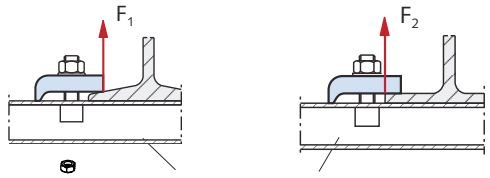
| FV Hot-dip galvanized | Clamping height h [mm] | Allowable load② [kN] | Preferred for use with | | |
|---|---|---|---|---|---|
| | | | Standard profile I | Standard profile IPB | Crane and running tracks④ |
| 60/10 | 10 | $F_1$ = 7.0 HALFEN Bolt M16 × 60, Grade 4.6 | 120 – 160 | 100 | A65, S33, S41 |
| 60/12 | 12 | | 220 – 240 | 140 | A100, S49, A75 |
| 60/14 | 14 | | 240 – 280 | 160 – 180 | A120, S54 |
| 60/16 | 16 | $F_2$ = 11.25 HALFEN Bolt M16 × 60, Grade 8.8 | 300 – 340 | 200 – 220 | S64 |
| 60/18 | 18③ | | 360 – 380 | 240 – 260 | - |
| 60/20 | 20③ | | 400 – 450 | 280 – 300 | - |

② Take the load capacity of Halfen Channels into account (Cantilever must be considered when selecting the Halfen Channels and bolts)
③ Bolt M16 × 80 necessary ④ Check flange thickness of profile!

Order example: **KLP - 60/10 - FV**

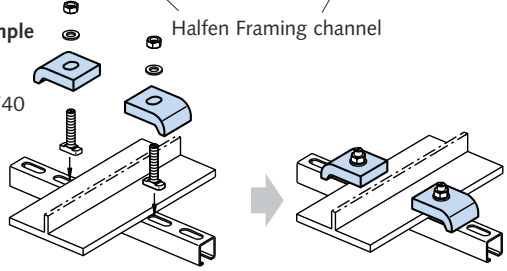



**Load diagram KLP - 60**




**Assembly example KLP - 60**

e.g. HL 50/40

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