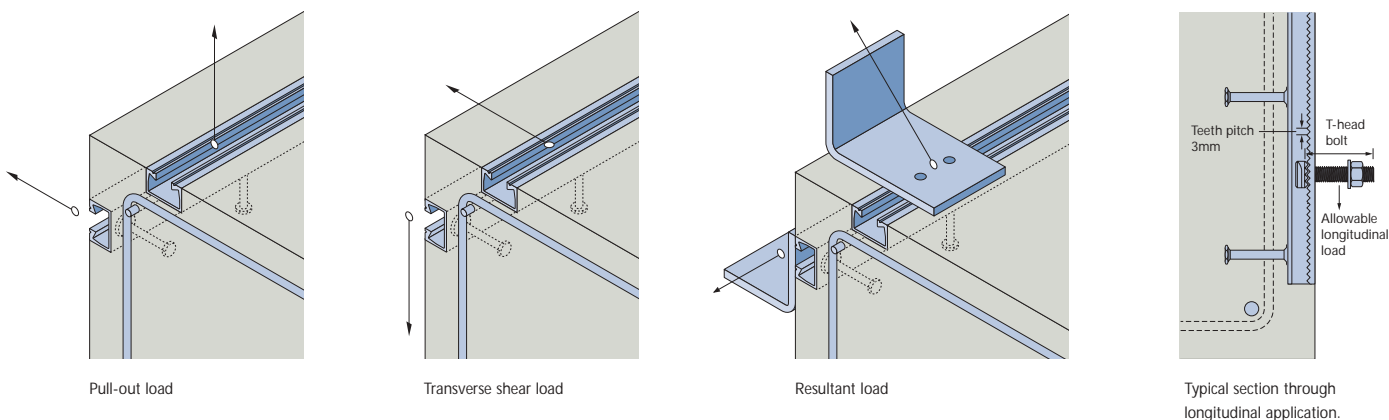


Loads, bolts and torque



Load direction

Halfen cast-in channel is suitable for loads in all directions, as shown in the diagrams above. Where the load is longitudinal it may be advantageous to use Grade 8.8 bolts or toothed channel to achieve the required load. Where the load is transverse shear, the parallel edge distance may increase (see allowable load tables).

Edge distances/load spacing

Halfen cast-in channel is particularly good close to edges and in pairs close together for four bolt connections. (For details see individual channel pages.)

Concrete grade/reinforcement

The load data tables in this guide assume channel cast in reinforced concrete Grade C35 or better. Channel anchors must always be positioned within the reinforcement cage, not in the concrete cover. (The cage could be two layers of mesh. For details, please consult Halfen Limited.)

T-head bolts

Normally, fixings to Halfen channels are by drop forged T-head bolts, face-entered into the channel after the concrete has set. The projecting bolt has a cross mark on the end of the shank so that the correct engagement of the T-head in the channel lips can be clearly seen. (For bolt details see product data pages.)

The allowable load capacity of a fixing depends on the channel and the anchor spacing. The T-head bolt is rarely critical, as its capacity normally exceeds that of the rolled profile. Small diameter bolts in large channels should be checked using the following table.

T-head bolt diameter	Grade 4.6 or stainless steel Max. allowable load on bolt shank Pull-out/transverse shear
M20	27.0 kN
M16	17.3 kN
M12	9.3 kN
M10	6.4 kN
M8	4.0 kN
M6	2.2 kN

Locking plates

Where the use of a standard set screw, or threaded rod, is preferred, back nuts or locking plates sized to suit every channel are available.

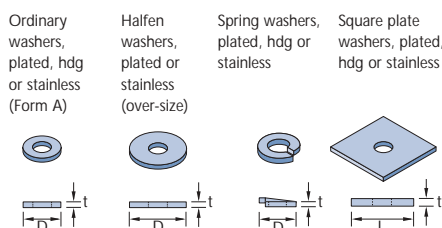
Locking plates are also face-entered into the channel after the concrete has set.

The torque data for Grade 4.6 or stainless steel bolts, as shown alongside, should be used.

Washers

If nuts are clamped tight to the lips of the channel, then plate washers are required to bridge the slot. Plate washers are also required, if the component is slotted.

Standard stock washers are shown below. For dimensions, please consult Halfen Limited.



Tightening torque

Torque is not normally critical when using cast-in channel and T-head bolts; in most cases the hook head ensures safe engagement. When the load is in the longitudinal direction, the clamping force should be carefully checked. As a guide, tightening torque figures are given below:

Tightening torque T-head bolt diameter	Grade 4.6 or stainless steel (N/m)	Grade 8.8* (N/m)
M30	400	-
M27	300	500
M 24	200	500
M20	120	300
M16	60	150
M12	25	70
M10	15	30
M8	8	-
M6	3	-
M16 toothed	70	70
M12 toothed	25	70

* Grade 8.8 bolts should normally only be used in hot rolled channels. For Grade 8.8 bolts in circular holes use hardened washers. For Grade 8.8 bolts in slots use plate washers plus hardened washers.

Fixing to formwork

Channels are manufactured with standard holes in the back and are normally fixed with nails (see details on page 29).