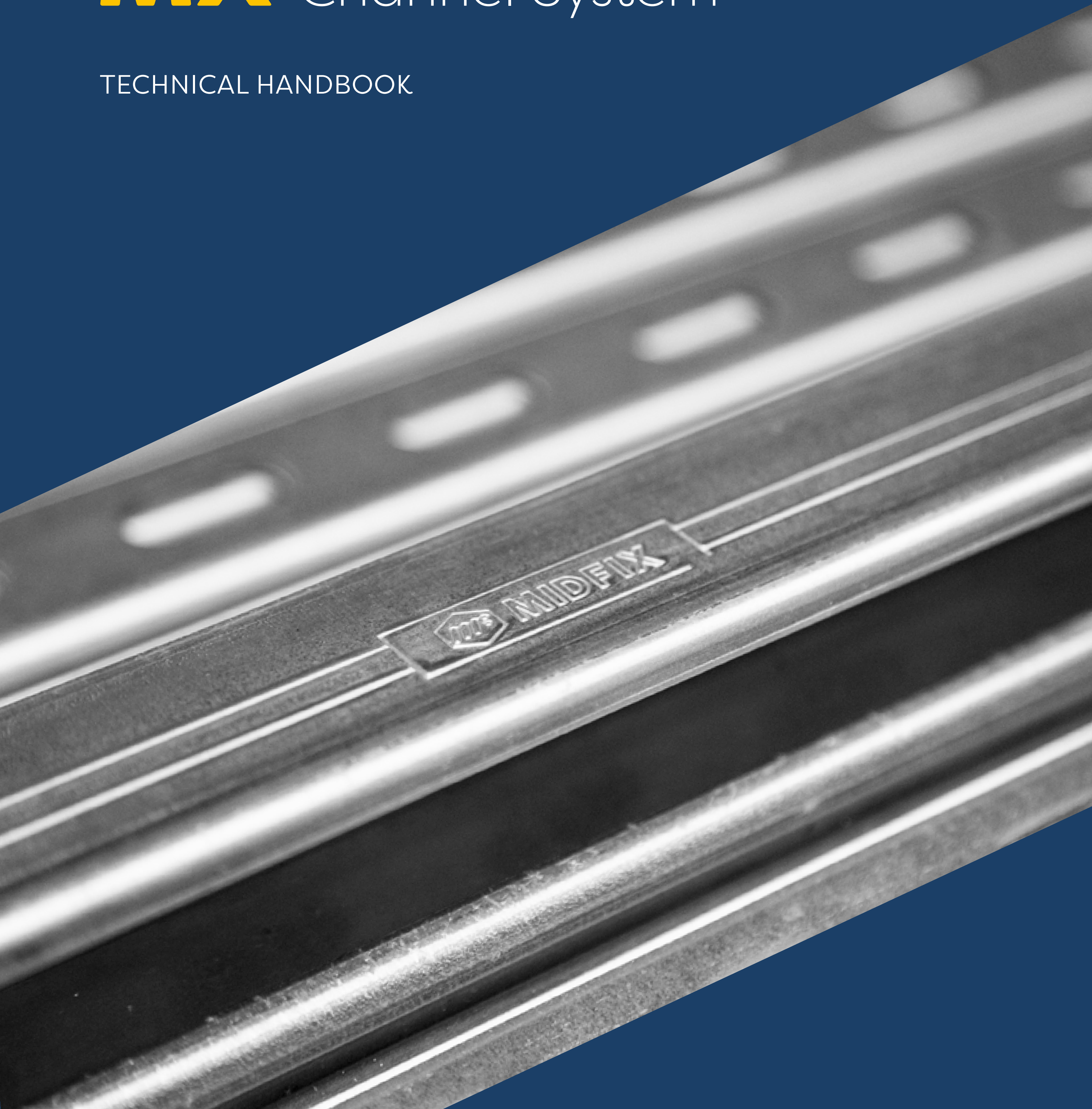
MIDFIX

MX Channel System

TECHNICAL HANDBOOK



Disclaimer

Load data published in this Technical Handbook is only valid for the products and specific applications given in the product drawings and/or product data and when assembled or installed to the criteria specified. Load data is not valid when MX products are mixed with third party products. Load data is exclusively for static and quasi-static loads at ambient temperatures and assuming adequate strength in the building structure, base materials and any building elements that the support is connected to, the suitability of which should always be checked and confirmed by a competent and qualified structural engineer.

This Technical Handbook is provided as an aid to assist competent and qualified users but is provided without any representation, guarantee or warranty as to the accuracy or completeness of the content or information in this Technical Handbook nor of the suitability for any particular purpose, use or wider application.

The MX User Guide pages are intended in the context of helpful information and suggested guidance for users of the MX channel system on a non-reliance basis. Accordingly, we make no representations, guarantees or warranties as to the suitability of such information and guidance and, to the extent permitted by law, shall not be liable to any person for any loss, damage or injury which may arise from the use of or reliance upon any information or guidance in the MX User Guide .For specific technical and project related questions independent professional advice should always be obtained.

Midland Fixings Ltd (MIDFIX) reserves the right to change any of the data and information published in this document at any time without prior notification.

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MX CHANNEL SYSTEM

MX USER GUIDE

MIDFIX MX CHANNEL SYSTEM MX

MIDFIX MX Channel System is designed to answer the needs of the M&E sector for a quality assured support system for building services installations. Supports are a key element in every building services installation and crucial to the integrity of the systems they support and safety of the building occupants.

Typically building services supports will combine channel and bracketry of unproven performance from a variety of sources into a single installation. As more attention is given to reducing risk and raising standards within the industry, it is becoming increasingly common that contractors are required to provide design verification for the supports. In turn this requires that the engineer has dependable information and load data for the components and connections used in the design and importantly that it can be evidenced that the products specified by the engineer are those which are actually used on site.

"When challenged, can you demonstrate that the structure you have installed can take the load applied to it, and that the supports and fixings are fit for purpose?"

MIDFIX MX answers this question and provides the specifier and contractor with a tested system of quality products identifiable by the MIDFIX stamp for on-site verification of system integrity. Another important consideration is that it is usual in the industry for supports to be considered in isolation from the anchors they are installed with. The MX Channel System integrates with the MIDFIX Anchor Fixings System into a single source solution. MX allows contractors to demonstrate that the supports they have installed will safely take the service loads applied and that both the supports and fixings are fit for purpose.

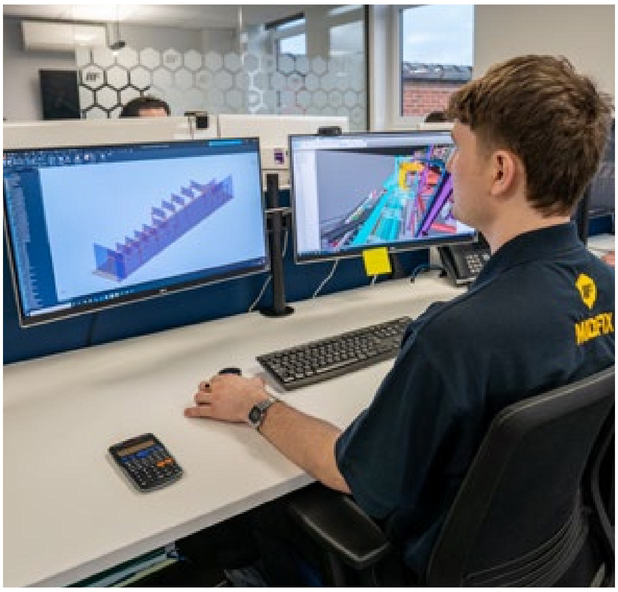
MIDFIX MX – the quality assured channel support system with competitive pricing and dependable supply for contractors committed to following industry best practice.

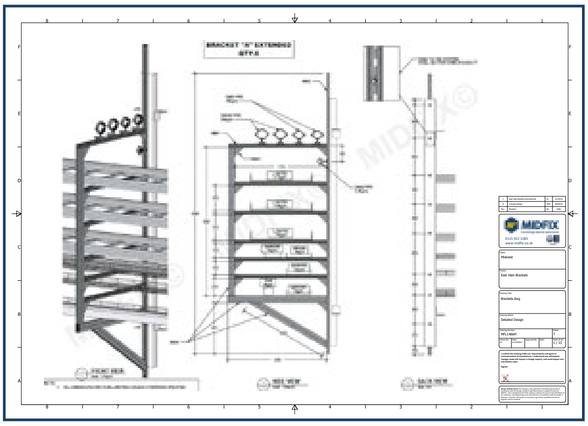
THE MX DIFFERENCE

MX channel and brackets are made to standard industry profiles and dimensions. As such, MX is instantly recognisable as a 'normal' channel system.

The difference with MX is the extensive testing that makes it suitable for use in engineered building services supports. Engineered means supports that have gone through a design process, however simple, that proves their load capacity. With MX, basic supports can be designed by any competent person, while the professional design engineer has the requisite data to design even complex supports.

The MX difference extends to the quality and identification of the components, and importantly, installer training to demonstrate competence and achieve safe installations.





TESTING

MX channels and bracket connections are extensively tested by an independent UKAS accredited test facility for proven performance. Our comprehensive and reliable load data is the outcome of real-life tests and invaluable for engineers designing supports and validating the integrity of an installation.

QUALITY

MX products are manufactured to MIDFIX product specifications and undergo a detailed quality inspection process to ensure consistently high quality, performance, and finish. Using MX means not only guaranteed performance but also a quality look and feel to the installation.

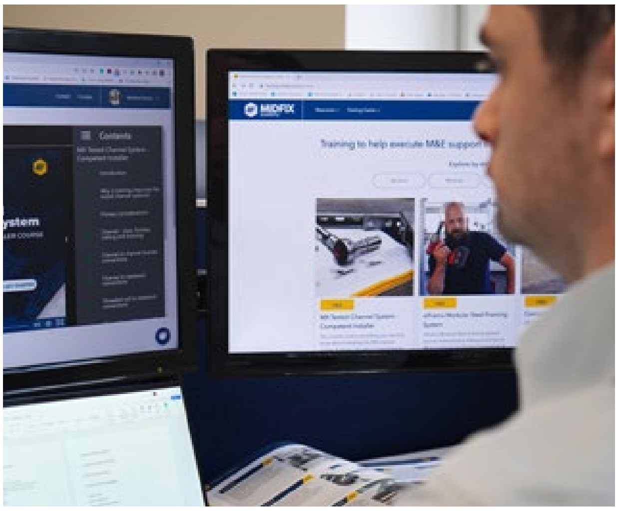
SYSTEM IDENTIFICATION

MX is intended to be used as a system and each component carries the MIDFIX name for onsite verification of system integrity. When using MX products exclusively as a system to the installation criteria the published design loads apply.

INSTALLER TRAINING

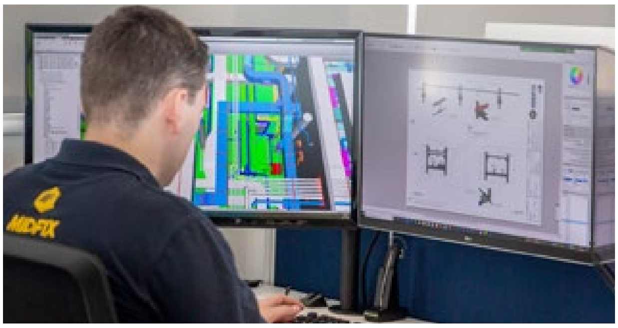
How to ensure that supports are installed to the required standard is a key concern for the industry and requires that installers and supervisors understand and follow basic installation principles.

MIDFIX are the first to address the need for installer training with the MIDFIX Academy, our specialist online learning platform for upskilling the M&E sector. MIDFIX Academy gives installers access to the training they need to confidently install the MX channel system to the correct standards. Trainees successfully completing the training and online assessments receive digital certification to show they have undertaken MX installer training and achieved the necessary level of competence.



DESIGN SERVICE

The MX system is backed-up by the unique MIDFIX ‘in-house’ design and engineering service. Using the latest software we design and engineer a wide range of building services supports. Engineering drawings and reports allow the contractor to evidence the design process and prove the supports are adequate for the loads they carry.



OFFSITE FABRICATION

The MIDFIX fabrication facility complements the MIDFIX design service to manufacture and prefabricate building services supports to the design specifications. Channel based supports are all designed and fabricated using the MX channel system. Using a tested system for both design and manufacture means we can stand behind the design loads and guarantee that the products used in the design are used in the finished product.

The many benefits of offsite fabrication, including labour, time, and material savings, are now widely recognised. In addition to these, when using MIDFIX, the contractor can prove that the supports are designed and manufactured to take the loads in question.

SUPPLY

When specifying a support system, cost and reliability of supply are important considerations. MX ticks all the boxes and combines a quality assured system with competitive pricing and dependable supply that ensures there are no frustrations and costly hold-ups on site.

CHANNEL SECTIONS

MX channel sections are manufactured in the UK to the highest industry standards. MX channel is manufactured by a cold rolling process to the requirements of BS 6946:1988 and marked at regular intervals along each length with the MIDFIX name and BS number as required by the standard. The British Standard ensures the channel conforms with the following criteria:

- Steel type
- Minimum yield strength
- Dimensions and tolerances
- Coating requirements
- Product marking

CHANNEL TYPES

Pre-galvanised Channels (PG) PRE-GALVANISED

Pre-galvanised channel is the industry standard finish that is used for the majority of building services applications. MX pre-galvanised channel is manufactured from continuously hot-dip zinc coated steel strip conforming to BS EN 10346:2009.

- **Material Standard:** BS EN 10346:2009
- **Material Specification:** S280GD + Z275
- **Minimum Yield Stress:** 280N/mm^2
- **Minimum Zinc Coating Mass:** 275g/m^2
- **Typical Zinc Coating Thickness:** 20µm

Hot Dip Galvanised Channels (HDG) HOT DIP GALVANISED

HDG channels are manufactured from uncoated hot-rolled steel strip and hot-dip galvanised after manufacture. This achieves a thicker zinc coating than with pre-galvanising and means all the edges of the channel and slots are zinc coated. Hot-dip galvanised channels give increased corrosion protection for use in external applications and more demanding environments.

- **Material Standard:** BS EN 10025-2:2019
- **Material Specification:** S275JR
- **Minimum Yield Strength:** 275N/mm^2
- **Hot Dip Galvanising to:** BS EN 1461:2009
- **Minimum Average Coating Thickness:** 55µm

Stainless Steel
Stainless steel channel products can be found listed separately in the MIDFIX catalogue. Loads for stainless steel products should not be assumed as being equivalent to those published in these pages.

CHANNEL BRACKETS

Manufactured from steel with a minimum yield stress of 275N/mm^2 and hot dip galvanised after manufacture unless indicated otherwise. MX brackets are stamped with the MIDFIX name and identifiable as genuine system components.

- ***Material Thickness:** 5mm
- **Minimum Yield Strength:** 275N/mm^2
- ***Hot Dip Galvanised:** 55µm minimum coating thickness

*Unless indicated otherwise

CHANNEL NUTS

Manufactured from steel with a minimum yield stress of 275N/mm² and available in Zinc Plated and Hot Dip Galvanised finishes. Channel nuts carry the MX stamp for identification as genuine system components.

- **Minimum Yield Strength:** 275N/mm²
- **Finishes – Electro Zinc Plated:** 5µm minimum plating thickness
  Hot Dip Galvanised: 55µm minimum coating thickness

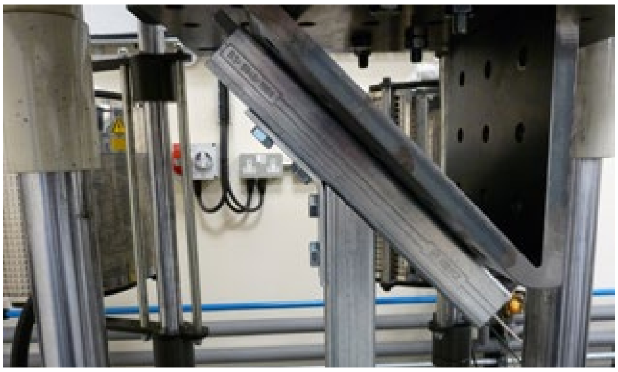
LOAD DATA & TESTING

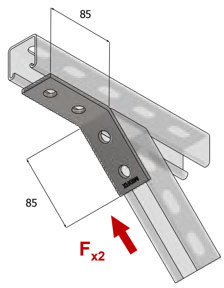
Channel Sections

Comprehensive safe working loads for MX channel sections are calculated in accordance with BS EN 1993-1-3: 2006 (Eurocode 3) Design of Steel Structures and published in the channel load tables.

Beam loads – published beam loads are calculated for simply supported beams provided with adequate lateral restraint over the span of the channel. Alternative loads are provided in the load tables for a range of common load scenarios.

Column loads – loads are provided for both concentric and eccentric axial loads. In practice column loads are usually applied to the column through the bracket connections mounted to the face of the channel. This creates an eccentric load which has a substantial effect on the load carrying capacity of the column. Published loads are for pin-pin end connections as representing the most appropriate column end conditions.



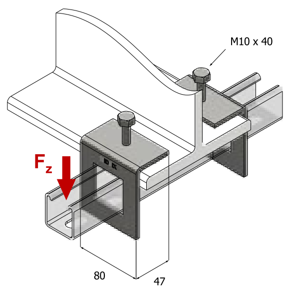


Channel Connections

Channel connections are arrangements of brackets, channel nuts and fasteners used to connect the channel sections together in a support structure or to connect channel sections to steelwork. MX channel connections are independently tested in a UKAS accredited test facility to establish safe loads for an extensive range of connection designs.

The MIDFIX product testing programme combines test procedures, safety coefficients and deflection limits to establish dependable load data for engineers designing support structures. The design of the bracket connection and directional load information is shown on the product drawings.

MX cantilever arms are tested when bolted to channel and when directly fixed to a substrate and establish safe loads for each application within the stress and deflection limits of the arms. Alternative load data is provided for uniform loads, centre point loads and loads applied to the end of the arm.



> All MX load data is for static and quasi-static loads.
> For dynamic loads consult MIDFIX Design and Engineering.

HS41

41 x 41 x 2.5 SLOTTED

PRE-GALVANISED

CODE	MF CODE
HS41/3M	1303441
HS41/4M	1304441
HS41/6M	1306441
PRE-CUT LENGTHS	
HS41/200	13014020
HS41/250	13014025
HS41/300	13014030
HS41/350	13014035
HS41/400	13014040
HS41/450	13014045
HS41/500	13014050
HS41/550	13014055
HS41/600	13014060
HS41/650	13014065
HS41/700	13014070

CODE	MF CODE
HS41/750	13014075
HS41/800	13014080
HS41/850	13014085
HS41/900	13014090
HS41/1000	13014100
HS41/1100	13014110
HS41/1200	13014120
HS41/1300	13014130
HS41/1400	13014140
HS41/1500	13014150
HS41/1600	13014160
HS41/1700	13014170
HS41/1800	13014180
HS41/1900	13014190
HS41/2000	13014200

HP41

41 x 41 x 2.5 PLAIN

PRE-GALVANISED

CODE	MF CODE
HP41/3M	1303341
HP41/6M	1306341

TECHNICAL DATA

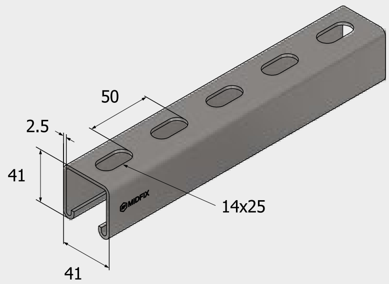
Material Standard: BS EN 10346:2009

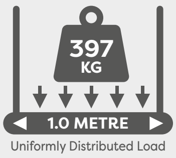
Material Specification: S280GD + Z275

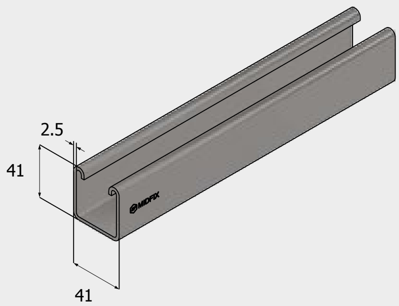
Minimum Yield Stress: 280N/mm²

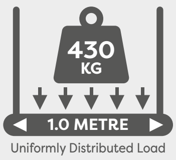
Finish: Pre-galvanised
- 275g/m² min. coating weight
- 20µm average coating thickness

Product Weights:
- HS41 – 2.41 kg/m
- HP41 – 2.53 kg/m









For **FULL LOAD DATA TABLES** see pages **40-43**

HS21

41 x 21 x 2.5 SLOTTED

PRE-GALVANISED

CODE	MF CODE	CODE	MF CODE
HS21/2M	1302421	**HS21/700**	13017070
HS21/3M	1303421	**HS21/750**	13017075
HS21/6M	1306421	**HS21/800**	13017080
PRE-CUT LENGTHS		**HS21/850**	13017085
HS21/200	13017020	**HS21/900**	13017090
HS21/250	13017025	**HS21/1000**	13017100
HS21/300	13017030	**HS21/1100**	13017110
HS21/350	13017035	**HS21/1200**	13017120
HS21/400	13017040	**HS21/1300**	13017130
HS21/450	13017045	**HS21/1400**	13017140
HS21/500	13017050	**HS21/1500**	13017150
HS21/550	13017055	**HS21/1600**	13017160
HS21/600	13017060	**HS21/1700**	13017170
HS21/650	13017065	**HS21/1800**	13017180

HP21

41 x 21 x 2.5 PLAIN

PRE-GALVANISED

CODE	MF CODE
HP21/3M	1303321
HP21/6M	1306321

TECHNICAL DATA

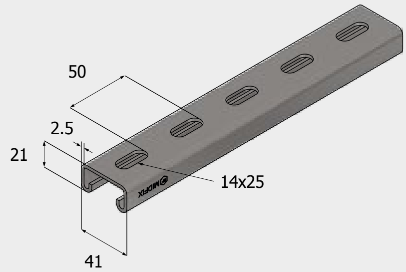
Material Standard: BS EN 10346:2009

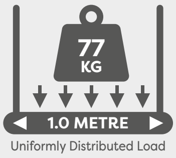
Material Specification: S280GD + Z275

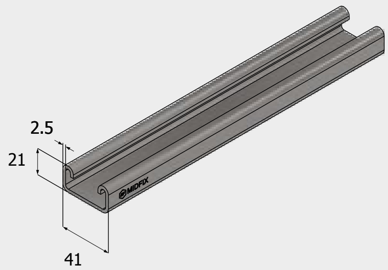
Minimum Yield Stress: 280N/mm²

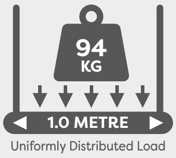
Finish: Pre-galvanised
- 275g/m² min. coating weight
- 20µm average coating thickness

Product Weights:
- HS21 – 1.62 kg/m
- HP21 – 1.73 kg/m









For **FULL LOAD DATA TABLES** see pages **44-47**

HB41/S

41 x 41 x 2.5 BACK TO BACK SLOTTED

PRE-GALVANISED

CODE	MF CODE
HB41/S/3M	1303541
HB41/S/6M	1306541

HB41/P

41 x 41 x 2.5 BACK TO BACK PLAIN

PRE-GALVANISED

CODE	MF CODE
HB41/P/3M	1303741
HB41/P/6M	1306741

HS82

41 x 82 x 2.5 SLOTTED

PRE-GALVANISED

CODE	MF CODE
HS82/6M	1306482

TECHNICAL DATA

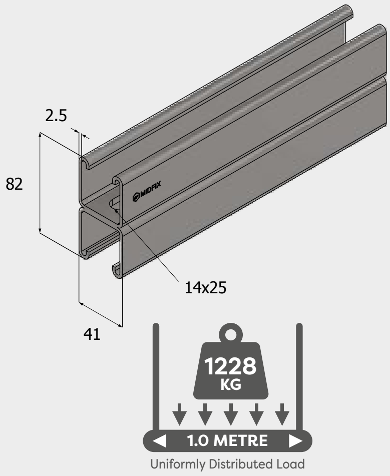
Material Standard: BS EN 10346:2009

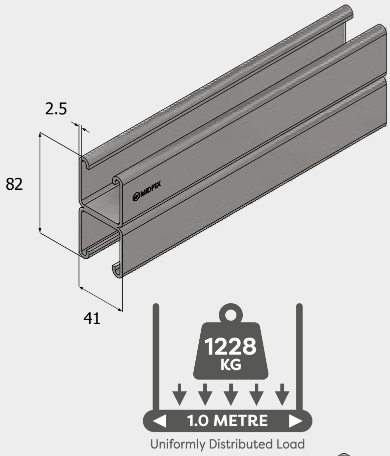
Material Specification: S280GD + Z275

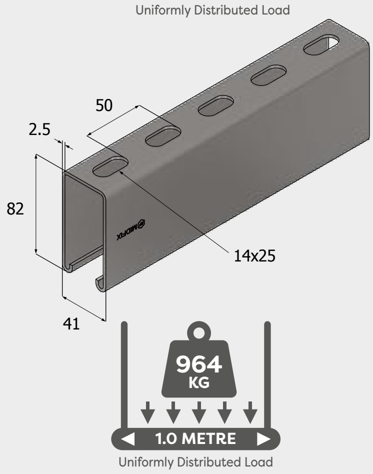
Minimum Yield Stress: 280N/mm²

Finish: Pre-galvanised
- 275g/m² min. coating weight
- 20µm average coating thickness

Product Weights:
- HB41/S – 4.59 kg/m
- HB41/P – 5.00 kg/m
- HS82 – 3.87 kg/m







For **FULL LOAD DATA TABLES** see pages **48-53**

LS41

41 x 41 x 1.5 SLOTTED

PRE-GALVANISED

CODE	MF CODE
LS41/3M	1303241

LS21

41 x 21 x 1.5 SLOTTED

PRE-GALVANISED

CODE	MF CODE
LS21/3M	1303221

TECHNICAL DATA

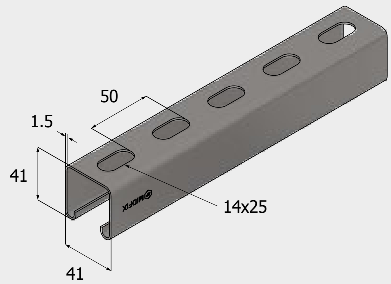
Material Standard: BS EN 10346:2009

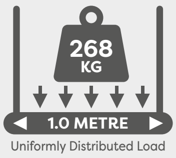
Material Specification: S280GD + Z275

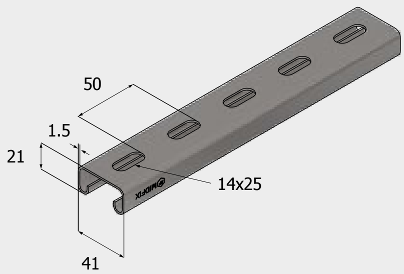
Minimum Yield Stress: 280N/mm²

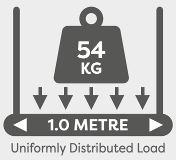
Finish: Pre-galvanised
- 275g/m² min. coating weight
- 20µm average coating thickness

Product Weights:
- LS41 – 1.52 kg/m
- LS21 – 0.97 kg/m









For **FULL LOAD DATA TABLES** see pages **54-55**

HS41G

41 x 41 x 2.5 SLOTTED

HOT DIP GALVANISED

CODE	MF CODE
HS41G/3M	1350441
HS41G/6M	1351441

HP41G

41 x 41 x 2.5 PLAIN

HOT DIP GALVANISED

CODE	MF CODE
HP41G/3M	1350341
HP41G/6M	1351341

HS21G

41 x 21 x 2.5 SLOTTED

HOT DIP GALVANISED

CODE	MF CODE
HS21G/3M	1350421
HS21G/6M	1351421

TECHNICAL DATA

Material Standard: BS EN 10025-2:2019

Material Specification: S275JR

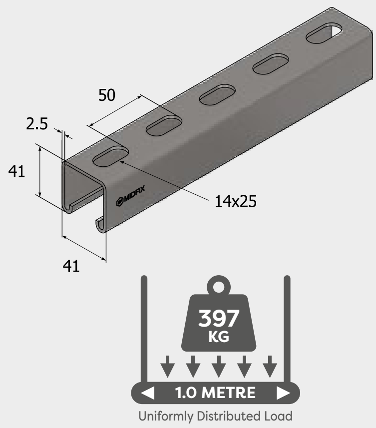
Minimum Yield Stress: 275N/mm²

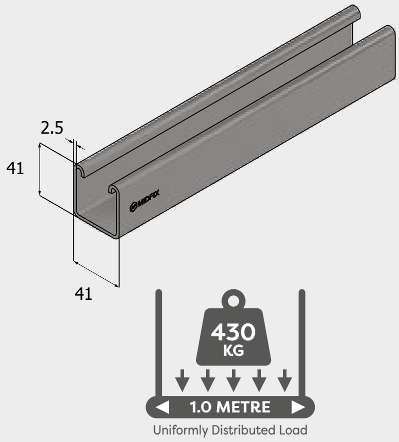
Finish: Hot Dip Galvanised to BS EN 1461:2009

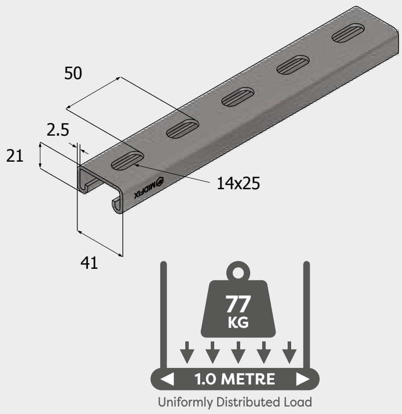
Average coating thickness: 55µm

Product Weights:

- HS41G – 2.41 kg/m
- HP41G – 2.53 kg/m
- HS21G – 1.62 kg/m







For **FULL LOAD DATA TABLES** see pages **40-45**

HB41G/S

41 x 41 x 2.5 BACK TO BACK SLOTTED

HOT DIP GALVANISED

CODE	MF CODE
HB41G/S/3M	1350541
HB41G/S/6M	1351541

HB41G/P

41 x 41 x 2.5 BACK TO BACK PLAIN

HOT DIP GALVANISED

CODE	MF CODE
HB41G/P/3M	1350741
HB41G/P/6M	1351741

TECHNICAL DATA

Material Standard: BS EN 10025-2:2019

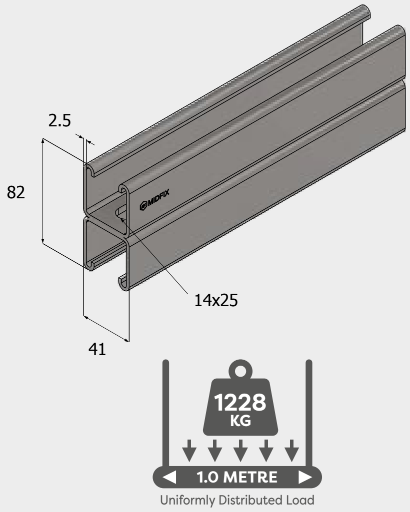
Material Specification: S275JR

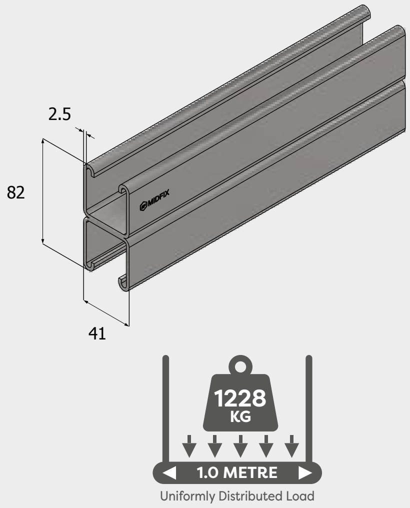
Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised to BS EN 1461:2009

Average coating thickness: 55µm

Product Weights:
- HB41G/S – 4.59 kg/m
- HB41G/P – 5.00 kg/m





For **FULL LOAD DATA TABLES** see pages **48-51**

CHANNEL NUTS – ZINC PLATED

BZP

No Spring

CODE	MF CODE	BOX QTY
MNP6	1309006	100
MNP8	1309008	100
MNP10	1309010	100
MNP12	1309012	100
MNP16*	1309016	100

Short Spring

CODE	MF CODE	BOX QTY
MNS6	1309106	100
MNS8	1309108	100
MNS10	1309110	100

Long Spring

CODE	MF CODE	BOX QTY
MNL6	1309206	100
MNL8	1309208	100
MNL10	1309210	100
MNL12	1309212	100

*Part not MIDFIX stamped

CHANNEL NUTS – HOT DIP GALVANISED

GALVANISED

No Spring

CODE	MF CODE	BOX QTY
HNP6	1310006	100
HNP8	1310008	100
HNP10	1310010	100
HNP12*	1310012	100

Long Spring

CODE	MF CODE	BOX QTY
HNL6	1310206	100
HNL8*	1310208	100
HNL10	1310210	100
HNL12*	1310212	100

*Parts not MIDFIX stamped

TECHNICAL DATA

Steel Minimum Yield Stress: 275N/mm²

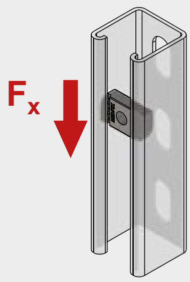
Finishes: Electro Zinc Plated -5μm minimum coating thickness
Hot Dip Galvanised - 55μm average coating thickness

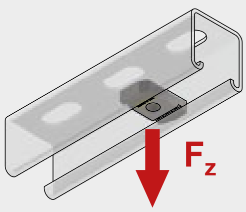
MAXIMUM SAFE LOADS

Loads apply to channel nuts assembled with:

1) MX 2.5mm channel
2) FB101 Channel Plate Washer
3) Grade 8.8 fastener
4) Torque settings as indicated in the table

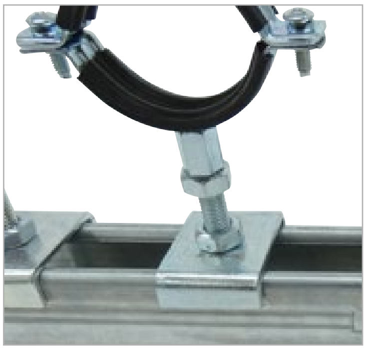
SIZE	TIGHTENING TORQUE (NM)	MAX SAFE LOAD F_X (KG)	MAX SAFE LOAD F_Z (KG)
M8	25	163	588
M10	55	289	673
M12	55	305	673





QWIKSTUDS

Combined channel nut, stud and lipped washer fitted with two nuts for locking off. Top spring for fast push and twist installation - hugely time saving product for installing pipe clamps.



CODE	MF CODE	STUD SIZE	MAX SAFE LOAD F_Z (KG)	BOX QTY
QST1040	1312040	M10 x 40	856	50
QST1050	1312050	M10 x 50	856	50
QST1060	1312060	M10 x 60	856	50

QST TECHNICAL DATA

Steel Minimum Yield Stress: 275N/mm²

Finish: Electro Zinc Plated -5µm minimum coating thickness

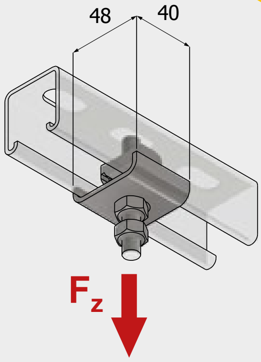
MAXIMUM SAFE LOAD

Load applies in tension as indicated with MX 2.5mm channel

RECOMMENDED TORQUE SETTING

12Nm
(Torque is not critical to the load in tension)

TORQUE 12Nm



QWIKNUTS

Combined channel nut and plate washer for fast one-handed installation.

CODE	MF CODE	SIZE	MAX SAFE LOAD F_Z (KG)	BOX QTY
QSN10	1313710	M10	405	50

QSN TECHNICAL DATA

Steel Minimum Yield Stress: 275N/mm²

Finish: Electro Zinc Plated -5µm minimum coating thickness

MAXIMUM SAFE LOAD

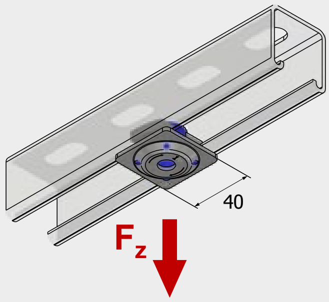
Load applies in tension as indicated with:

1) **MX 2.5mm channel**
2) **MX threaded rod**

RECOMMENDED TORQUE SETTING

12Nm
(Torque is not critical to the load in tension)

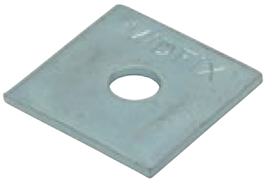
TORQUE 12Nm



CHANNEL PLATES

Lipped Washer

CODE	MF CODE	SIZE	THICKNESS	FINISH	BOX QTY
FB099/10	1320010	M10	3mm	Bright Zinc Plated	100



CODE	MF CODE	SIZE	THICKNESS	FINISH	BOX QTY
FB100/6	1321006	M6	3mm	Bright Zinc Plated	100
FB100/8	1321008	M8	3mm	Bright Zinc Plated	100
FB100/10	1321010	M10	3mm	Bright Zinc Plated	100

CODE	MF CODE	SIZE	THICKNESS	FINISH	BOX QTY
FB101/8	1323008	M8	5mm	Bright Zinc Plated	100
FB101/10	1323010	M10	5mm	Bright Zinc Plated	100
FB101/12	1323012	M12	5mm	Bright Zinc Plated	100

CODE	MF CODE	SIZE	THICKNESS	FINISH	BOX QTY
FB101/6HDG*	1324006	M6	5mm	Hot Dip Galvanised	100
FB101/8HDG*	1324008	M8	5mm	Hot Dip Galvanised	100
FB101/10HDG	1324010	M10	5mm	Hot Dip Galvanised	100
FB101/12HDG	1324012	M12	5mm	Hot Dip Galvanised	100

*Parts not MIDFIX stamped

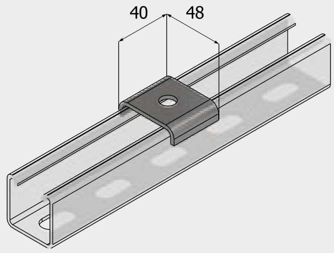
TECHNICAL DATA

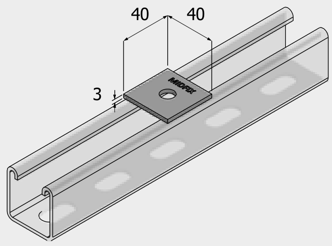
Steel Thickness: 3.0mm and 5.0mm

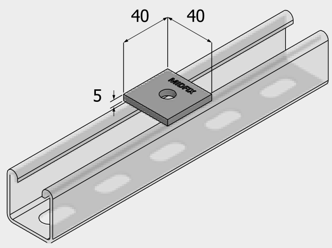
Minimum Yield Stress: 275N/mm²

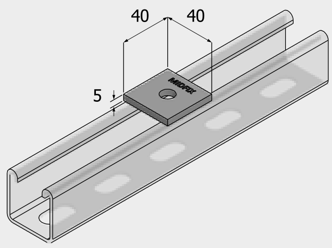
Finish: Electro Zinc Plated - 5μm minimum coating thickness

Hot Dip Galvanised - 55μm minimum coating thickness









FLAT BRACKETS

CODE	MF CODE	BOX QTY
FB102	1325102	80

CODE	MF CODE	BOX QTY
FB103	1325103	60

CODE	MF CODE	BOX QTY
FB104	1325104	40

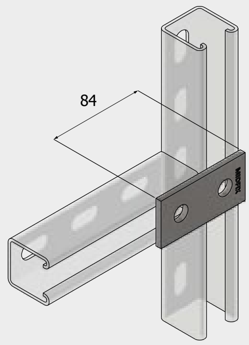
CODE	MF CODE	BOX QTY
FB105	1325105	80

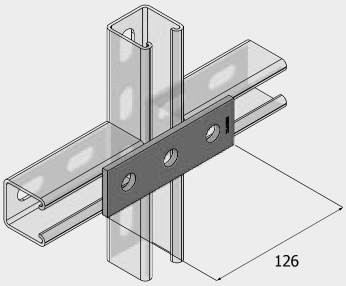
TECHNICAL DATA

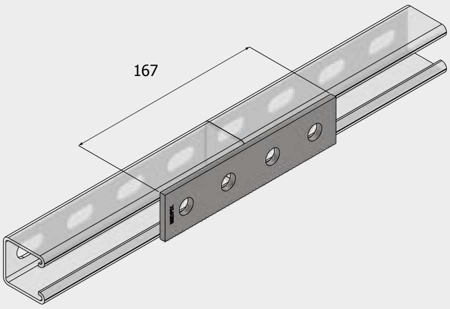
Steel Thickness: 5.0mm

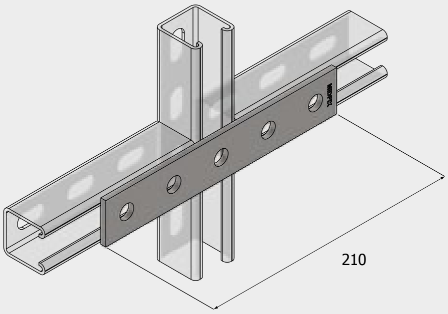
Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness

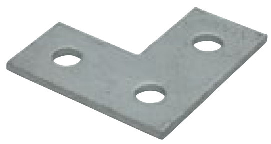








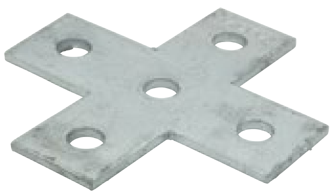
FLAT BRACKETS



CODE	MF CODE	MAX SAFE LOAD F_X (KG)	BOX QTY
FB107	1325107	212	70

CODE	MF CODE	*MAX SAFE LOAD F_X 1 (KG)	MAX SAFE LOAD F_X 2 (KG)	BOX QTY
FB108	1325108	212	244	35

*Total combined load for connection



CODE	MF CODE	*MAX SAFE LOAD F_X (KG)	BOX QTY
FB109	1325109	244	25

*Total combined load for connection

CODE	MF CODE	BOX QTY
FB110	1325110	25

Part not MIDFIX stamped

TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

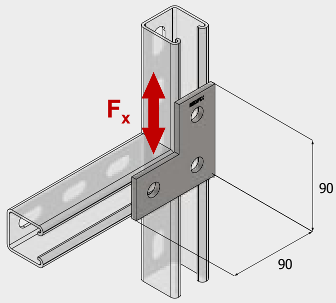
Finish: Hot Dip Galvanised - 55µm minimum coating thickness

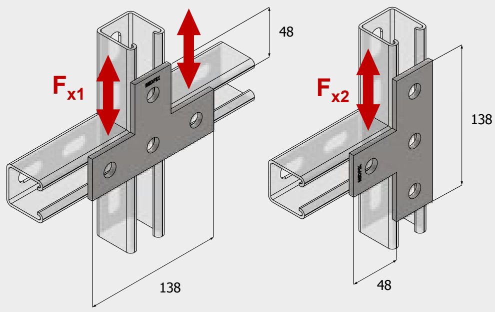
MAXIMUM SAFE LOADS

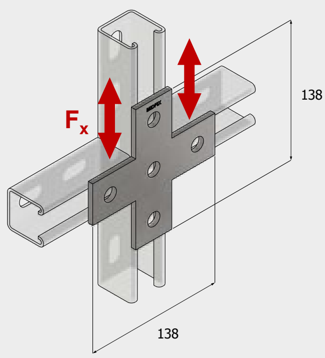
Loads apply to the channel connection shown assembled with:

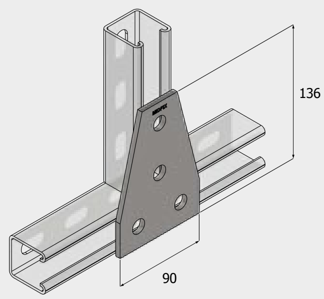
1) **MX 2.5mm channel**
2) **M10 DIN 933 Grade 8.8 set screws with M10 DIN 125 washers**
3) **55Nm torque setting**

TORQUE 55Nm









ANGLE BRACKETS

CODE	MF CODE	*1 MAX SAFE LOAD F_X (KG)	*2 MAX SAFE LOAD F_X (KG)	BOX QTY
AB200	1327200	270	79	50

CODE	MF CODE	*1 MAX SAFE LOAD F_X (KG)	*2 MAX SAFE LOAD F_X (KG)	BOX QTY
AB201	1327201	270	105	50

CODE	MF CODE	*1 MAX SAFE LOAD F_X (KG)	*2 MAX SAFE LOAD F_X (KG)	BOX QTY
AB202	1327202	500	105	50

TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness

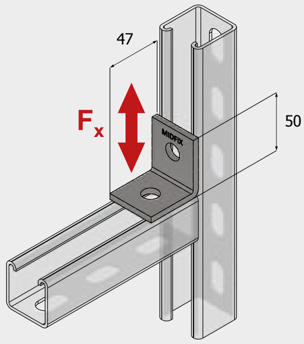
MAXIMUM SAFE LOADS

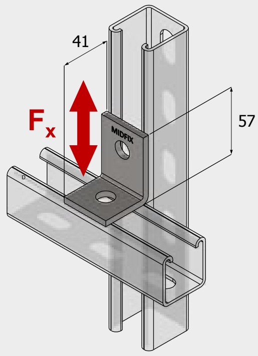
*1 Load applies to the channel connection shown assembled with:

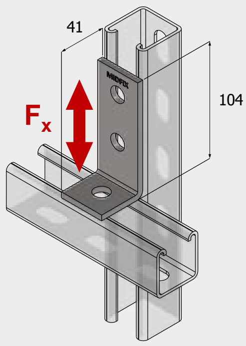
1) **MX 2.5mm channel**
2) **M10 DIN 933 Grade 8.8 set screws with M10 DIN 125 washers**
3) **55Nm torque setting**

TORQUE 55Nm

*2 Load applies to bracket only without channel







ANGLE BRACKETS

CODE	MF CODE	*1 MAX SAFE LOAD F_X (KG)	*2 MAX SAFE LOAD F_X (KG)	BOX QTY
AB203	1327203	500	74	50

CODE	MF CODE	*1 MAX SAFE LOAD F_X (KG)	BOX QTY
AB205	1327205	500	50

CODE	MF CODE	BOX QTY
AB206	1327206	50

TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness

MAXIMUM SAFE LOADS

*1 Load applies to the channel connection shown assembled with:

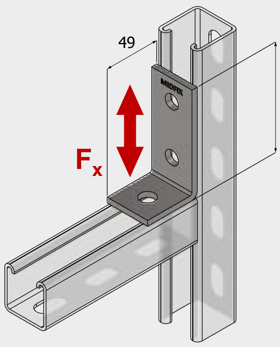
1) MX 2.5mm channel

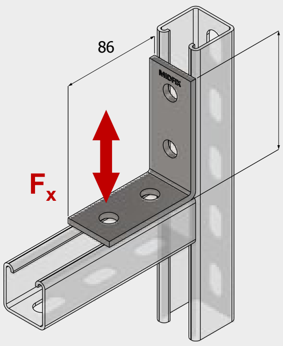
2) M10 DIN 933 Grade 8.8 set screws with M10 DIN 125 washers

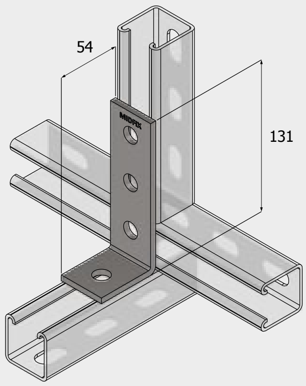
3) 55Nm torque setting

TORQUE 55Nm

*2 Load applies to bracket only without channel







ANGLE BRACKETS

CODE	MF CODE	*1 MAX SAFE LOAD F_x (KG)	*2 MAX SAFE LOAD F_x (KG)	BOX QTY
AB208	1327208	660	316	40

NOTE: This bracket requires 4 fasteners – additional inner holes offer a choice of hole positions.

CODE	MF CODE	BOX QTY
AB209	1327209	50

Part not MIDFIX stamped

CODE	MF CODE	BOX QTY
AB213	1327213	25

Part not MIDFIX stamped

TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness

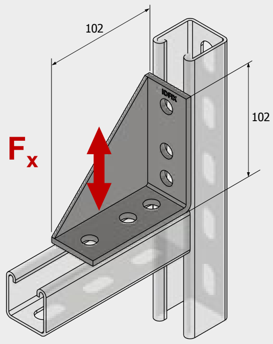
MAXIMUM SAFE LOADS

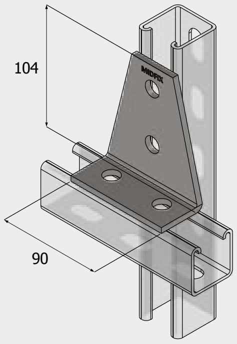
*1 Load applies to the channel connection shown assembled with:

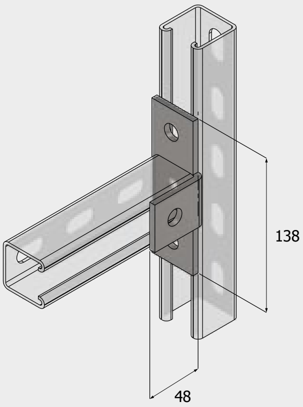
1) **MX 2.5mm channel**
2) **4 x M10 DIN 933 Grade 8.8 set screws with M10 DIN 125 washers**
3) **55Nm torque setting**

TORQUE 55Nm

*2 Load applies to bracket only without channel







ANGLE BRACKETS

CODE	MF CODE	BOX QTY
AB216	1327216	10

Part not MIDFIX stamped

CODE	MF CODE	BOX QTY
AB217	1327217	10

Part not MIDFIX stamped

CODE	MF CODE	ANGLE	MAX SAFE LOAD $F_{x}1$ (KG)	MAX SAFE LOAD $F_{x}2$ (KG)	BOX QTY
AB218	1327218	45°	179	655	100

TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

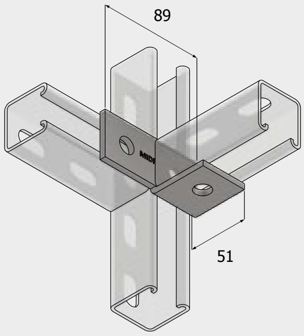
Finish: Hot Dip Galvanised - 55µm minimum coating thickness

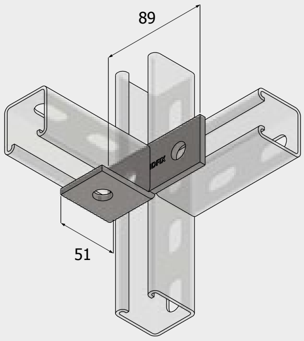
MAXIMUM SAFE LOADS

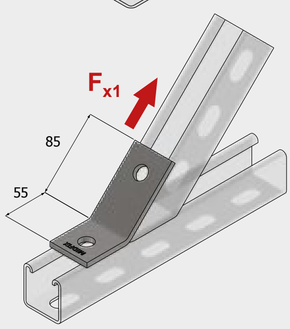
Load applies to the channel connection shown assembled with:

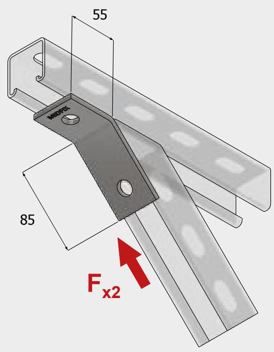
1) **MX HS/HP41 channel**
2) **M10 DIN 933 Grade 8.8 set screws with M10 DIN 125 washers**
3) **55Nm torque setting**

TORQUE 55Nm









ANGLE BRACKETS

CODE	MF CODE	ANGLE	MAX SAFE LOAD F_X1 (KG)	MAX SAFE LOAD F_X2 (KG)	BOX QTY
AB219	1327219	45°	118	430	100

CODE	MF CODE	ANGLE	MAX SAFE LOAD F_X1 (KG)	MAX SAFE LOAD F_X2 (KG)	BOX QTY
AB220	1327220	45°	488	750	100

CODE	MF CODE	MAX SAFE LOAD F_X (KG)	BOX QTY
AB222	1327222	203	50

Part not MIDFIX stamped

TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

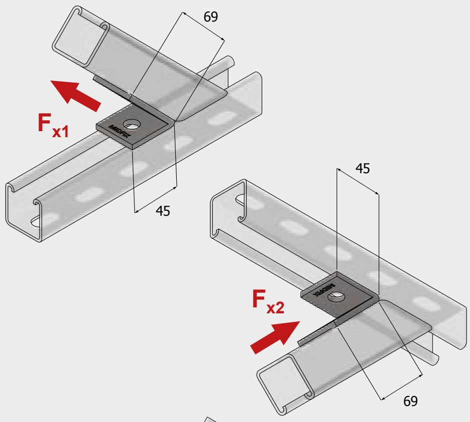
Finish: Hot Dip Galvanised - 55µm minimum coating thickness

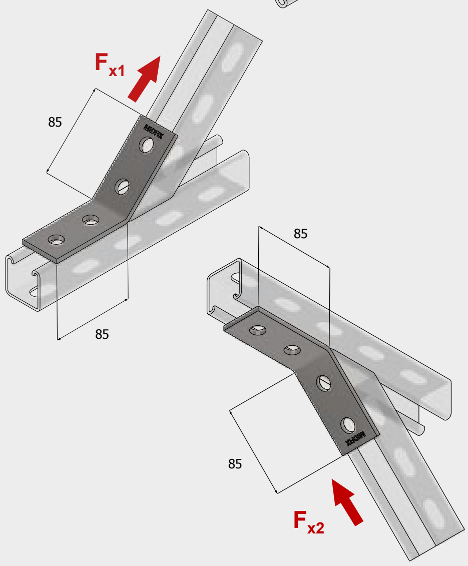
MAXIMUM SAFE LOADS

Load applies to the channel connection shown assembled with:

1) **MX HS/HP41 channel**
2) **M10 DIN 933 Grade 8.8 set screws with M10 DIN 125 washers**
3) **55Nm torque setting**

TORQUE 55Nm

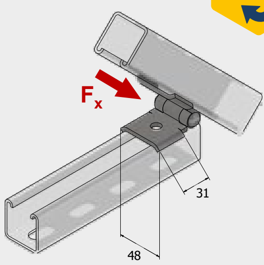




AB222 BOLT AND TORQUE REQUIREMENTS

1) **Use M10 DIN 933 Grade 8.8 set screws**
3) **50Nm torque setting**

TORQUE 50Nm



U BRACKETS

CODE	MF CODE	DEPTH	MAX SAFE LOAD F_x (KG)	MAX SAFE LOAD F_z (KG)	BOX QTY
UB400	1331400	21	576	965	50

Part not MIDFIX stamped

CODE	MF CODE	DEPTH	MAX SAFE LOAD F_x (KG)	MAX SAFE LOAD F_z (KG)	BOX QTY
UB401	1331401	41	576	965	50

CODE	MF CODE	DEPTH	BOX QTY
UB402	1331402	41 X 82	25

Part not MIDFIX stamped

CODE	MF CODE	DEPTH	MAX SAFE LOAD F_z (KG)	BOX QTY
UB403	1331403	82	965	25

TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness

MAXIMUM SAFE LOADS

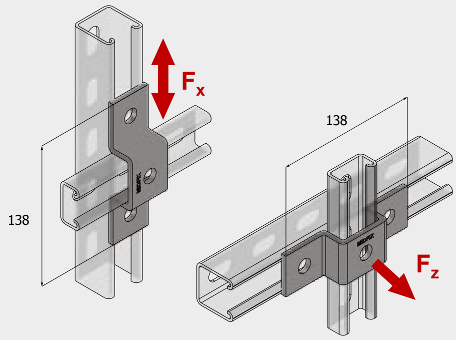
Load applies to the channel connection shown assembled with:

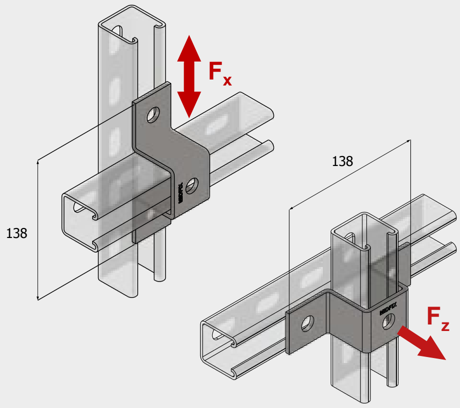
1) MX 2.5mm channel

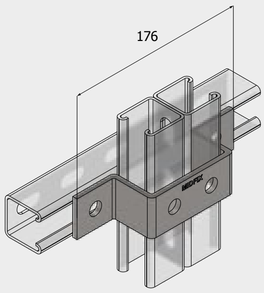
2) M10 DIN 933 Grade 8.8 set screws with M10 DIN 125 washers

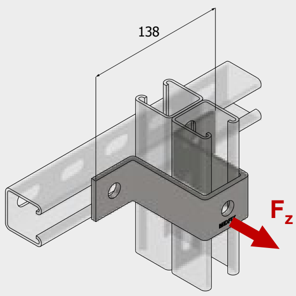
3) 55Nm torque setting

TORQUE 55Nm









ZED BRACKETS

CODE	MF CODE	DEPTH	BOX QTY
ZB300	1329300	21	50

Part not MIDFIX stamped

CODE	MF CODE	DEPTH	BOX QTY
ZB301	1329301	41	50

CODE	MF CODE	DEPTH	BOX QTY
ZB302	1329302	82	25

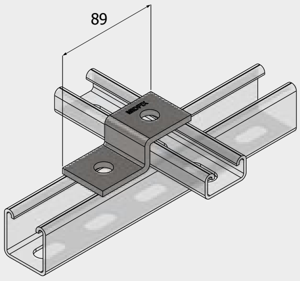
Part not MIDFIX stamped

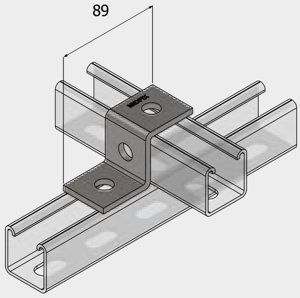
TECHNICAL DATA

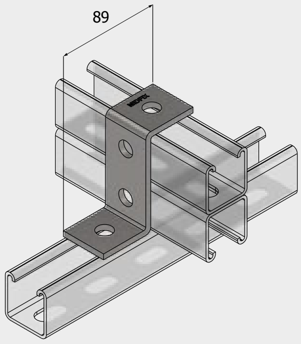
Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness







FRAMING BRACKETS

CODE	MF CODE	*MAX SAFE LOAD F_x (KG)	BOX QTY
SB801	1339801	546	30

*Total combined load for connection

CODE	MF CODE	*MAX SAFE LOAD F_x (KG)	BOX QTY
SB802	1339802	546	30

*Total combined load for connection

CODE	MF CODE	*MAX SAFE LOAD F_x (KG)	BOX QTY
SB804	1339804	270	25

Part not MIDFIX stamped

*Total combined load for connection

TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm^2

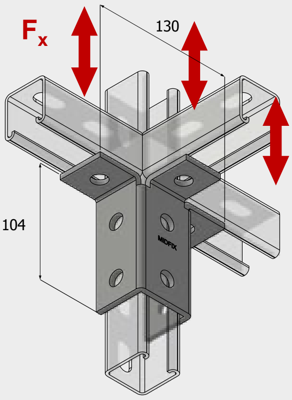
Finish: Hot Dip Galvanised - 55µm minimum coating thickness

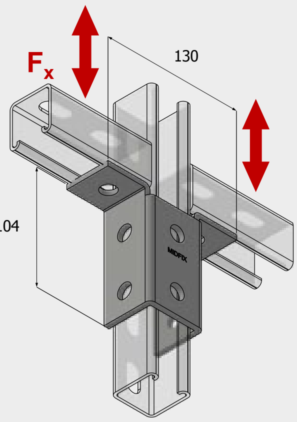
MAXIMUM SAFE LOADS

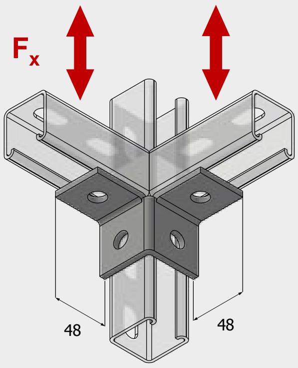
Load applies to the channel connection shown assembled with:

1) **MX HS/HP41 channel**
2) **M10 DIN 933 Grade 8.8 set screws with M10 DIN 125 washers**
3) **55Nm torque setting**

TORQUE 55Nm







C BRACKET

CODE	MF CODE	*MAX SAFE LOAD F_Z (KG)	BOX QTY
SB803	1339803	54	50

INTERNAL CHANNEL SPLICES

CODE	MF CODE	FOR CHANNEL	BOX QTY
SP500/21	1333501	21mm	25
SP500/41	1333502	41mm	70

EXTERNAL CHANNEL SPLICES

CODE	MF CODE	FOR CHANNEL	BOX QTY
SP501/41	1333512	41mm	20

SB803 TECHNICAL DATA

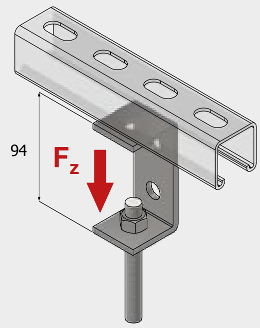
Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness

MAXIMUM SAFE LOAD

*Load applies to bracket only without channel



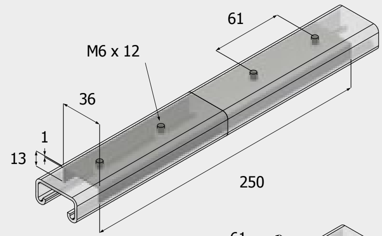
SP500 TECHNICAL DATA

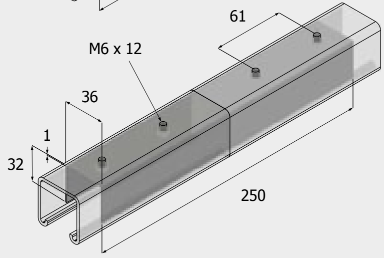
Steel Thickness: 1.0mm

Minimum Yield Stress: 275N/mm²

Finish: Pre-galvanised - 20µm coating thickness

Screws: Supplied with electro zinc plated locking screws



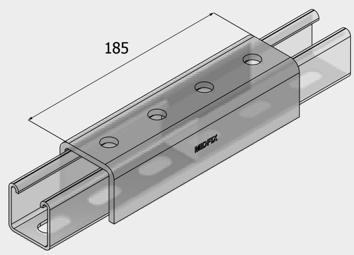


SP501 TECHNICAL DATA

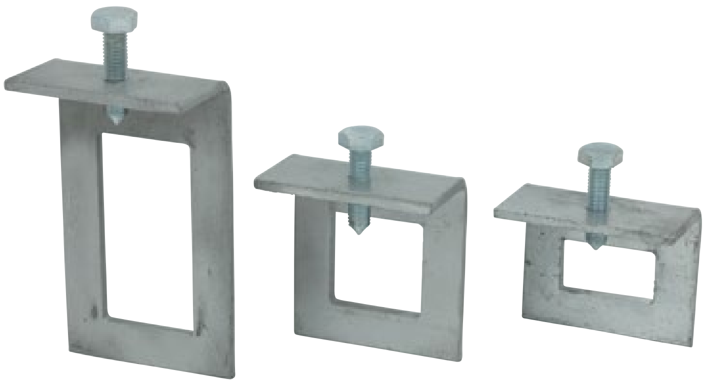
Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness



BEAM CLAMPS



CODE	MF CODE	FOR CHANNEL	MAX FLANGE THICKNESS	MAX SAFE LOAD F_Z (KG)	BOX QTY
BC700/21	1337702	21mm	20	202	50
BC700/41	1337704	41mm	20	202	50
BC700/82	1337708	82mm	25	202	40

CODE	MF CODE	FOR CHANNEL	MAX FLANGE THICKNESS	MAX SAFE LOAD F_Z (KG)	BOX QTY
BC701/41	1337714	41mm	22	668	40
BC701/82	1337718	82mm	22	668	30

- Fully assembled ready to install
- All parts hot dip galvanised

BC700 TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55μm minimum coating thickness

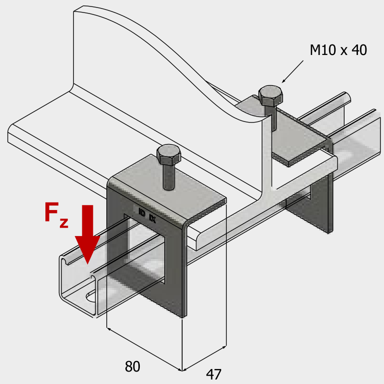
Screw: M10 x 40 electro zinc plated cone point screw – grade 8.8

MAXIMUM SAFE LOADS

BC700 must be used in pairs – maximum safe load is:

1) **Per pair of beam clamps**
2) **Using MX 2.5mm channel**
3) **10Nm torque setting for screws**
4) **The load capacity of the channel and steel must be considered.**

TORQUE 10Nm



BC701 TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55μm minimum coating thickness

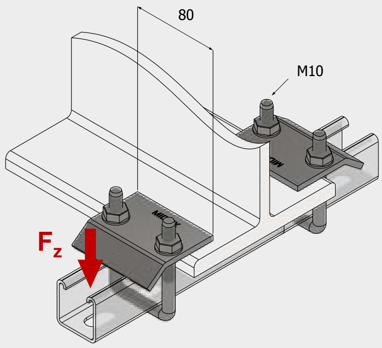
U-Bolt: M10 with Hot Dip Galvanised finish

MAXIMUM SAFE LOADS

BC701 must be used in pairs – maximum safe load is:

1) **Per pair of beam clamps**
2) **Using MX 2.5mm channel**
3) **20Nm torque setting for nuts**
4) **The load capacity of the channel and steel must be considered.**

TORQUE 20Nm



BEAM CLAMPS

CODE	MF CODE	FOR CHANNEL	MAX FLANGE THICKNESS	MAX SAFE LOAD F_Z (KG)	BOX QTY
BC703	1338703	All sizes	20	382	100

CODE	MF CODE	FOR CHANNEL	MAX FLANGE THICKNESS	MAX SAFE LOAD F_Z (KG)	BOX QTY
BC705	1338705	All sizes	22	187	50

BC703 TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness

Requires: M10 x 40 set screw

MAXIMUM SAFE LOADS

BC703 must be used in pairs – maximum safe load is:

1) Per pair of beam clamps

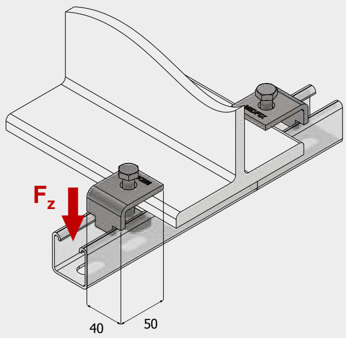
2) Using MX 2.5mm channel

3) M10 DIN 933 Grade 8.8 set screws with M10 DIN 125 washers

4) 20Nm torque setting

5) The load capacity of the channel and steel must be considered.

TORQUE 20Nm



BC705 TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness

Screw: M10 x 40 electro zinc plated cone point screw – grade 8.8

MAXIMUM SAFE LOADS

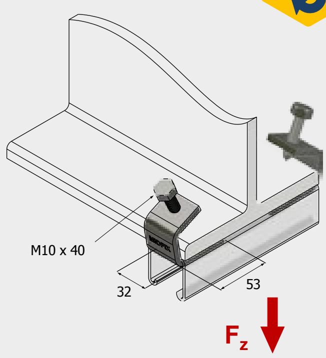
BC705 must be used in pairs – maximum safe load is:

1) Per pair of beam clamps

2) Using MX 2.5mm channel

3) 10Nm torque setting for screw

TORQUE 10Nm



BEAM CLAMPS

CODE	MF CODE	FOR CHANNEL	MAX FLANGE THICKNESS	MAX SAFE LOAD F_Z (KG)	BOX QTY
BC706	1338706	41mm	20	381	50

CODE	MF CODE	FOR CHANNEL	MAX SAFE LOAD F_X (KG)	MAX SAFE LOAD F_Z (KG)	BOX QTY
BC707	1338707	41mm	94	131	50

Supplied in pairs

BC706 TECHNICAL DATA

Steel Thickness: 10mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness

Screw: M10 x 40 electro zinc plated cone point screw – grade 8.8

MAXIMUM SAFE LOADS

Maximum safe load applies to beam clamp with:

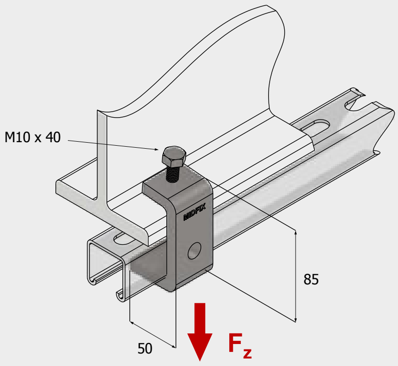
1) Load applied in the direction indicated

2) MX HS/HP41 channel

3) 10Nm torque setting for cone point screw

4) Bolted connection to channel

TORQUE 10Nm



BC707 TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness

Screw: M10 x 40 electro zinc plated cone point screw – grade 8.8

MAXIMUM SAFE LOADS

Loads should be applied in one direction only

Maximum safe load is for a pair of beam clamps with:

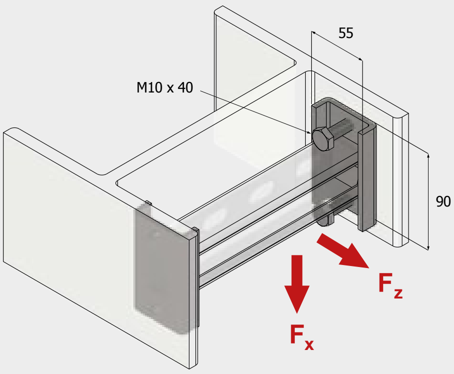
1) Load applied in the direction indicated

2) MX HS/HP41 channel

3) 400mm maximum steel size between flanges

4) 10Nm torque setting for screws

TORQUE 10Nm



BASE PLATES

CODE	MF CODE	CHANNEL SIZE	BOX QTY
FP601	1335601	41	36

CODE	MF CODE	CHANNEL SIZE	BOX QTY
FP602	1335602	82	20

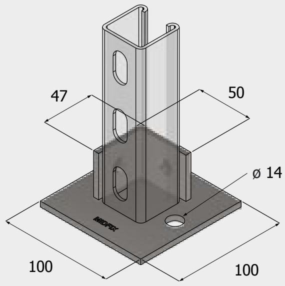
CODE	MF CODE	CHANNEL SIZE	BOX QTY
FP603/41	1335634	41	10

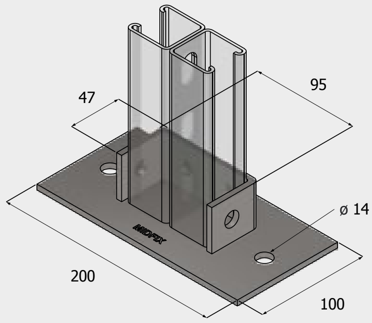
TECHNICAL DATA

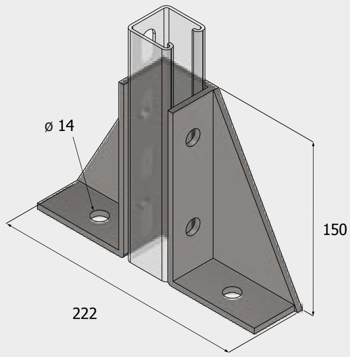
Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm^2

Finish: Hot Dip Galvanised - 55µm minimum coating thickness







BASE PLATES

CODE	MF CODE	CHANNEL SIZE	BOX QTY
FP603/82	1335638	82	8

CODE	MF CODE	CHANNEL SIZE	MAX SAFE LOAD F_X (KG)	BOX QTY
FP604/41	1335644	41	689	10

CODE	MF CODE	CHANNEL SIZE	MAX SAFE LOAD F_X (KG)	BOX QTY
FP604/82	1335648	82	741	10

TECHNICAL DATA

Steel Thickness: 5.0mm

Minimum Yield Stress: 275N/mm²

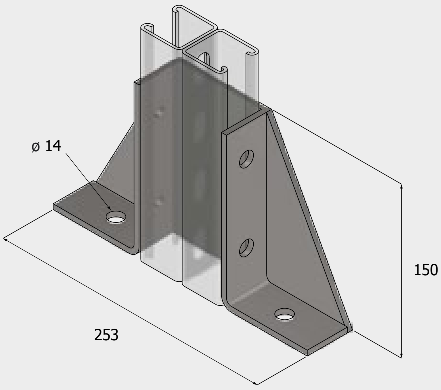
Finish: Hot Dip Galvanised - 55µm minimum coating thickness

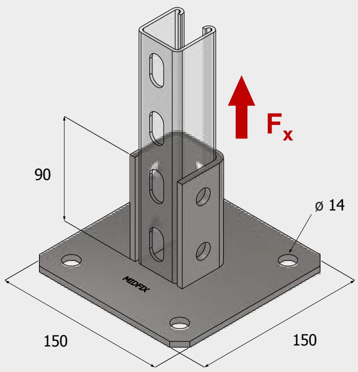
MAXIMUM SAFE LOADS

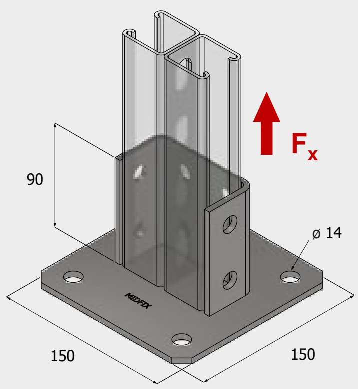
Loads apply to the channel connection shown assembled with:

1) **MX 2.5mm channel**
2) **M10 DIN 933 Grade 8.8 set screws with M10 DIN 125 washers**
3) **55Nm torque setting**

TORQUE 55Nm







CANTILEVER ARMS - SINGLE

CODE	MF CODE	LENGTH
SCA4/150	1341150	150
SCA4/300	1341300	300
SCA4/450	1341450	450
SCA4/600	1341600	600
SCA4/750	1341750	750
SCA4/900	1341900	900
SCA4/1000	13411000	1000

CODE	MAX SAFE LOADS		
	LOAD 1 F (KG)	LOAD 2 F (KG)	LOAD 3 F (KG)
SCA4/150	*479.9**	*479.9**	*240.0*
SCA4/300	*240.0*	*240.0*	*120.0*
SCA4/450	*160.0*	*160.0*	*80.0*
SCA4/600	*120.0*	*120.0*	*60.0*
SCA4/750	*96.0*	*96.0*	*48.0*
SCA4/900	*80.0*	*80.0*	*36.4*
SCA4/1000	*72.0*	*72.0*	*29.1*

***SCA4/150 - maximum load when bolted to channel is 295KG**

Notes to Cantilever Arm Load Data

Published load data considers each of the following criteria:

- Maximum yield strength of the channel section
- Deflection limit of the channel section = L/150
- Maximum yield strength of the back plate
- Safety factored failure load of the arm under test
- Maximum permitted deflection of the arm under test
- Factored slip load for arms bolted to channel

TECHNICAL DATA

Steel Thickness: Back Plate 8.0mm; Channel 2.5mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55µm minimum coating thickness

Back Plates: Slotted pattern for easy alignment

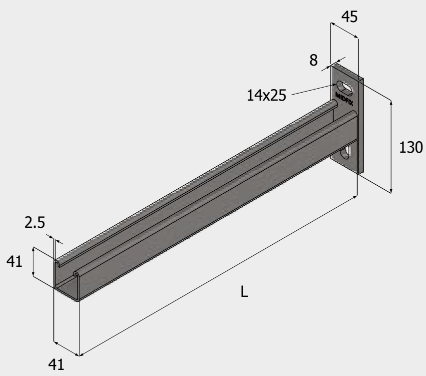
MAXIMUM SAFE LOADS

Loads apply to

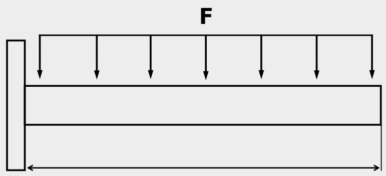
1. Arms fixed to a load bearing substrate with appropriate M12 Anchors
2. Arms bolted to:

- **MX 2.5mm channel with:**
- **M12 Grade 8.8 hex head set screws**
- **M12 DIN 125 washers**
- **60Nm torque setting**

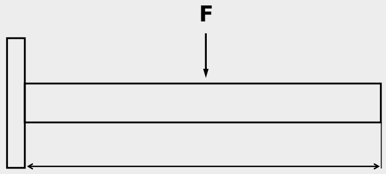
TORQUE 60Nm



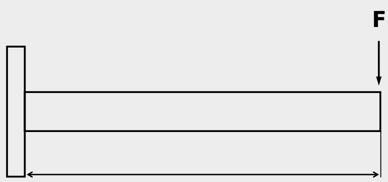
Load 1 – Uniformly Distributed Load



Load 2 – Centre Point Load



Load 3 – End Point Load



CANTILEVER ARMS - DOUBLE

CODE	MF CODE	LENGTH
DCA5/450	1343450	450
DCA5/600	1343600	600
DCA5/750	1343750	750
DCA5/900	1343900	900

CODE	MAX SAFE LOADS		
	LOAD 1 F (KG)	LOAD 2 F (KG)	LOAD 3 F (KG)
DCA5/450	*236.6*	*236.6*	*118.3*
DCA5/600	*177.4*	*177.4*	*88.7*
DCA5/750	*141.9*	*141.9*	*71.0*
DCA5/900	*118.3*	*118.3*	*59.1*

Notes to Cantilever Arm Load Data

Published load data considers each of the following criteria:

- Maximum yield strength of the channel section
- Deflection limit of the channel section = L/150
- Maximum yield strength of the back plate
- Safety factored failure load of the arm under test
- Maximum permitted deflection of the arm under test
- Factored slip load for arms bolted to channel

TECHNICAL DATA

Steel Thickness: Back Plate 8.0mm; Channel 2.5mm

Minimum Yield Stress: 275N/mm²

Finish: Hot Dip Galvanised - 55μm minimum coating thickness

Back Plates: Slotted pattern for easy alignment

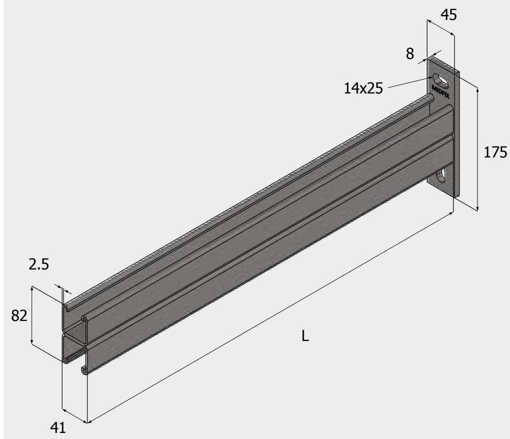
MAXIMUM SAFE LOADS

Loads apply to

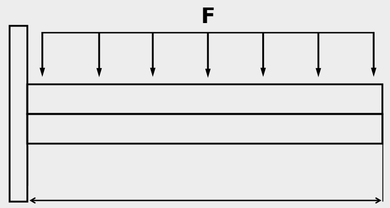
1. Arms fixed to a load bearing substrate with appropriate M12 Anchors
2. Arms bolted to:

- **MX 2.5mm channel with:**
- **M12 Grade 8.8 hex head set screws**
- **M12 DIN 125 washers**
- **60Nm torque setting**

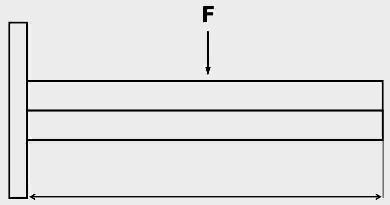
TORQUE 60Nm



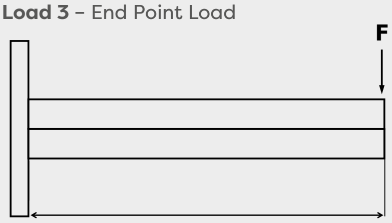
Load 1 – Uniformly Distributed Load



Load 2 – Centre Point Load



Load 3 – End Point Load



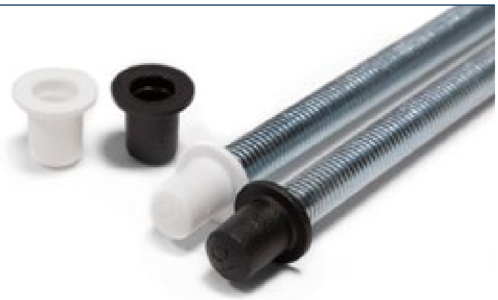
MX THREADED ROD – ZINC PLATED

SIZE	MF CODE	*1 MAX SAFE LOAD F_Z (KG)	*2 MAX SAFE LOAD F_Z (KG)	PACK QTY
M8 x 1m	1601081	447	400	50
M8 x 3m	1601083	447	400	25
M10 x 500mm	1605485	793	584	50
M10 x 1m	1601101	793	584	25
M10 x 2m	1601102	793	584	20
M10 x 3m	1601103	793	584	20
M12 x 1m	1601121	1443	584	20
M12 x 3m	1601123	1443	584	10

MX THREADED ROD – GALVANISED

SIZE	MF CODE	*1 MAX SAFE LOAD F_Z (KG)	*2 MAX SAFE LOAD F_Z (KG)	PACK QTY
M10 x 3m	1604103	793	584	50
M12 x 3m	1604123	1443	584	25

MX STUD PROTECTION CAPS



SIZE	DEPTH	BLACK MF CODE	WHITE MF CODE	PACK QTY
M8	12	1615008	1615108	100
M10	15	1615010	1615110	100
M12	18	1615012	1615112	100

MX threaded rod is manufactured to MIDFIX specification with guaranteed product weight, thread size and material strength. It is independently tested for safe allowable loads and identifiable by the distinctive coloured wrapping and MIDFIX labels.

TECHNICAL DATA

Strength Classification: 4.8 – minimum ultimate tensile strength 420N/mm²

Finishes: Electro zinc plated - 5μm minimum coating thickness

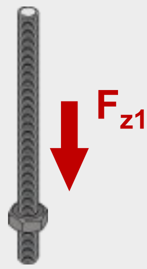
Galvanised - 50μm average coating thickness

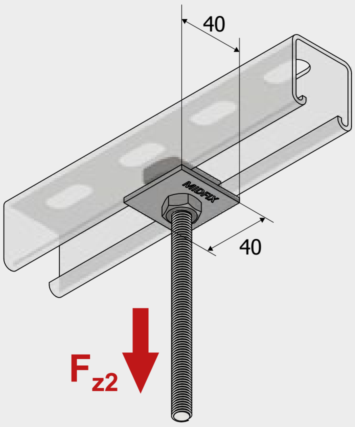
MAXIMUM SAFE LOADS

*1 Load – safe static tensile load for MX threaded rod combined with DIN 934 Class 8 nut.

*2 Load – safe static tensile load for MX threaded rod combined with:

1) **MX 2.5mm channel**
2) **MX Channel Nut**
3) **MX FB101 Channel Plate Washer**
4) **DIN 934 Class 8 Nut**





CHANNEL END CAPS

Channel end caps are designed to use with 2.5mm gauge channels.

Technical Data

Halogen free LDPE plastic

CODE	MF CODE	SIZE	FOR CHANNEL	COLOUR	PACK QTY
EC21/B	1315621	21mm	2.5mm	Black	100
EC21/W	1315721	21mm	2.5mm	White	100
EC41/B	1315641	41mm	2.5mm	Black	100
EC41/W	1315741	41mm	2.5mm	White	100
LEC21/B	1315699	21mm	1.5mm	Black	100

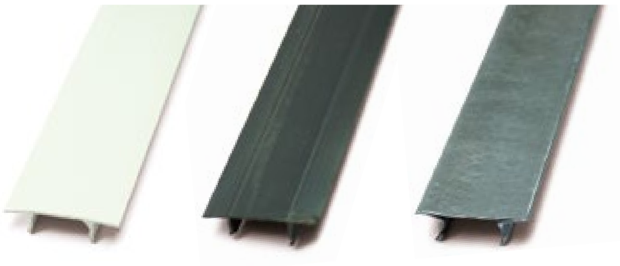
CHANNEL COVER STRIP

Closure lids for all standard 41mm channel profiles.

Technical Data

Plastic – Rigid PVC for internal and external use

Steel - 20mµ pre-galvanised finish



CODE	MF CODE	DESCRIPTION	PACK QTY
CSP/W	1314103	White Plastic Cover Strip x 3m	40
CSP/B	1314203	Black Plastic Cover Strip x 3m	50
CSP/G	1314303	Galvanised Cover Strip x 3m	–

MX FLANGE HEAD SCREWS

- Hexagon head set screws with a serrated washer flange ideal for MX bracket connections
- Time saving – One piece screw, avoids having to use separate washers and prevents washers being omitted during installation
- Good clamping force with anti-vibe serrations
- Grade 8.8 high tensile
- Bright Zinc Plated

CODE	MF CODE	SUITS CHANNEL	BOX QTY
M10 X 20	1500410	21mm	100
M10 X 25	1500412	41mm	100
M10 X 30	1500412	41mm	100

MX TORQUE WRENCH SET

High quality torque wrench set specifically designed for the M&E contractor. A compact set that covers all the tightening applications of building services supports and anchors.

- 10 – 70Nm torque range – ideal range for all channel and anchor torque settings.
- Interchangeable head – snap-fit head for sockets and open-ended spanner attachments.
- Compact size – wrench overall length just 360mm for easy access.
- Comprehensive accessories – to suit M8, M10 & M12 fastener sizes.
- Serialised – etched serial number and calibration certificate unique to each tool.
- Robust case – 450x150x60mm

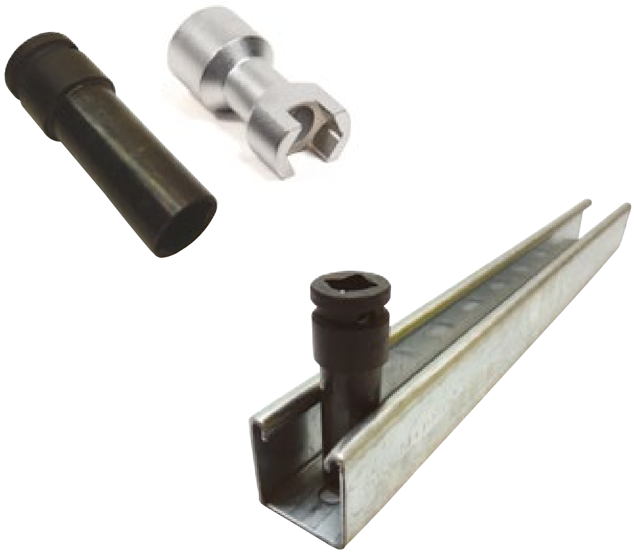
CODE	MF CODE	DESCRIPTION
MXT70-S	2551370	MX Torque Wrench Set - 10-70Nm

Contents

- MXT70 torque wrench handle
- ½" drive ratchet head
- ½" sockets: 13/17/19mm
- Open end insert tools: 13/17/19mm
- Open ring insert tools: 13/17/19mm
- Calibration certificate

MX CHANNEL PROFILE SOCKETS

Specially shaped ½" drive sockets for accessing bolts within channel profiles.



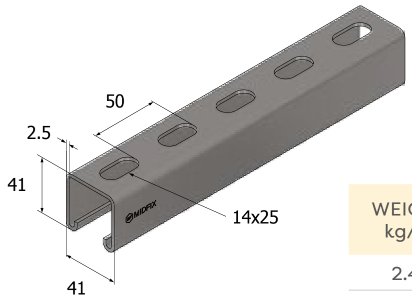
CODE	MF CODE	SIZE	BOLT SIZE
CS15	2549915	15mm	*MCS10-HX
CS17	2549917	17mm	M10
CS19	2549919	19mm	M12

*MIDFIX 10mm hexagon concrete screws

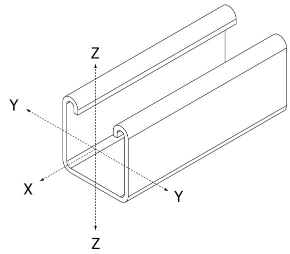
MX Channel Sections

HS41 — 41 x 41 x 2.5 SLOTTED

PRE-GALVANISED | **GALVANISED**



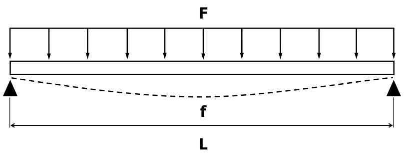
WEIGHT kg/m	MOMENT OF INERTIA		SECTION MODULUS	
	I y-y	I z-z	S y-y	S z-z
2.41	6.03cm⁴	9.14cm⁴	2.85cm³	4.43cm³



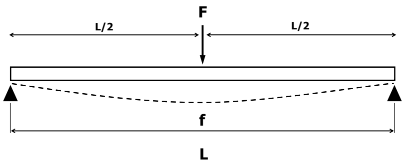
Beam Loads

LENGTH L (mm)	ULTIMATE LOADS - LOAD 1		DESIGN LOADS			
	LOAD Fmax (KG)	DEFLECTION Fmax (mm)	LOAD 1 F (KG)	LOAD 2 F (KG)	LOAD 3 F (KG)	LOAD 4 F (KG)
250	1597.0	0.3	*1597.0*	*798.5*	*598.9*	*399.2*
500	797.6	1.0	*797.6*	*398.8*	*299.1*	*199.4*
750	530.7	2.3	*530.7*	*265.3*	*199.0*	*132.7*
1000	396.9	4.0	*396.9*	*198.5*	*148.9*	*99.2*
1250	316.4	6.2	314.1	*158.2*	115.2	*79.1*
1500	262.6	8.9	216.6	*131.3*	79.4	57.0
1750	223.9	12.1	157.5	98.4	57.8	41.5
2000	194.8	15.7	119.0	74.4	43.6	31.3
2250	172.0	19.8	92.4	57.7	33.9	24.3
2500	153.6	24.2	73.1	45.7	26.8	19.3
2750	138.5	29.1	58.8	36.7	21.6	15.5
3000	125.8	34.3	47.7	29.8	17.5	12.6
3250	114.9	39.8	38.9	24.3	14.3	10.3
3500	105.5	45.6	31.9	19.9	11.7	–
3750	97.3	51.8	26.0	16.3	–	–
4000	90.0	58.1	21.1	13.2	–	–
4250	83.5	64.7	17.0	10.6	–	–
4500	77.7	71.4	13.4	–	–	–
4750	72.4	78.3	10.3	–	–	–
5000	67.6	85.3	–	–	–	–
5250	63.2	92.2	–	–	–	–
5500	59.1	99.2	–	–	–	–
5750	55.3	106.1	–	–	–	–
6000	51.8	112.9	–	–	–	–

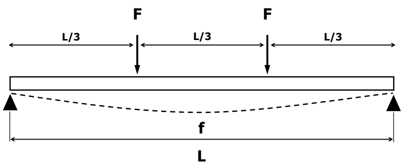
Load 1 – Uniformly Distributed Load



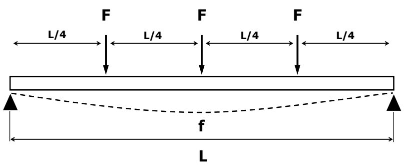
Load 2 – Centre Point Load



Load 3 – Two Point Loads



Load 4 – Three Point Loads



Notes to Beam Loads data:

- Yield Stress = 275N/mm²
- Modulus of elasticity: E = 210000N/mm²
- All beam loads are for simply supported beams
- All load data is for applied loads. The channel self-weight is already deducted.
- Ultimate Loads - maximum uniformly distributed load limited by stress using safety coefficient =1.6
- Design Loads - maximum loads limited by deflection: f = L/200. *(Values in italics are limited by stress not deflection)*

HS41

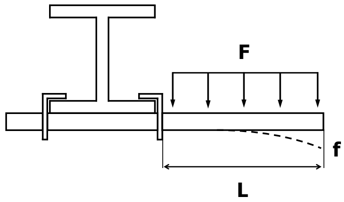
41 x 41 x 2.5 SLOTTED

PRE-GALVANISED GALVANISED

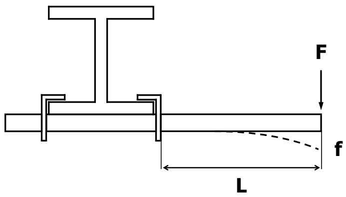
Cantilever Loads

LENGTH L (mm)	DESIGN LOADS	
	LOAD 1 F (KG)	LOAD 2 F (KG)
up to 200	*498.6*	*248.9*
300	*331.7*	*165.3*
400	*248.1*	*123.3*
500	*197.8*	97.9
600	*164.1*	70.8
700	140.0	51.7
800	121.7	39.2
900	107.5	30.6
1000	91.7	24.4
1100	72.6	19.7
1200	57.8	16.2
1300	46.1	13.4
1400	36.5	11.1
1500	28.5	–

Load 1 – Uniformly Distributed Load



Load 2 – End Point Load



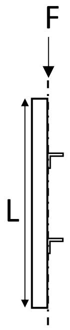
Notes to Cantilever Loads data:

- Yield Stress = 275N/mm²
- Modulus of elasticity: E = 210000N/mm²
- All load data is for applied loads. The channel self-weight is already deducted
- Design Loads - maximum loads limited by deflection: f = L/150. *(Values in italics are limited by stress using safety coefficient =1.6)*
- Load capacity of beam clamps and primary steel must be considered

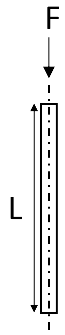
Column Loads

LENGTH L (mm)	DESIGN LOADS	
	LOAD 1 F (KG)	LOAD 2 F (KG)
500	1530.2	4774.5
750	1409.9	4462.1
1000	1266.6	3175.7
1250	1116.9	2461.2
1500	973.4	1983.5
1750	843.3	1632.8
2000	729.5	1363.3
2250	632.1	1151.2
2500	549.6	981.7

Load 1 – Eccentrically Loaded



Load 2 – Concentrically Loaded



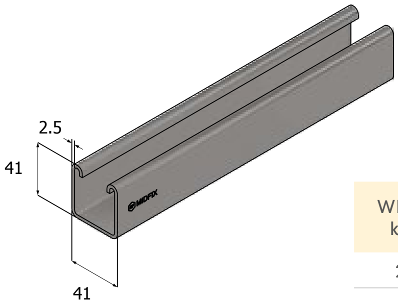
Notes to Column Loads data:

- Yield Stress = 275N/mm²
- Modulus of elasticity: E = 210000N/mm²
- Design loads include safety coefficient = 1.6
- Loads are calculated for pin-pin connections and column effective length of 1.0
- Concentric loads – loads applied at the centroid of the column (typical for beams placed on top of columns)
- Eccentric Loads – for loads applied at the open face of the channel (typical of channel bracket connections)

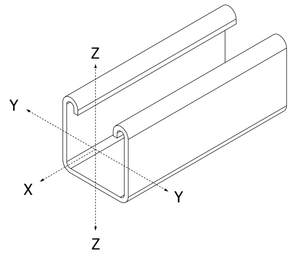
HP41

41 x 41 x 2.5 PLAIN

PRE-GALVANISED GALVANISED



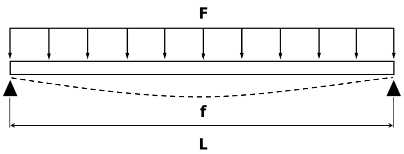
WEIGHT kg/m	MOMENT OF INERTIA		SECTION MODULUS	
	I y-y	I z-z	S y-y	S z-z
2.53	7.14cm⁴	9.19cm⁴	3.09cm³	4.45cm³



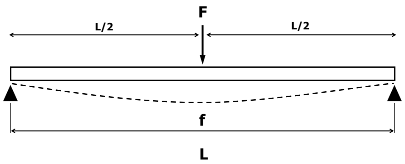
Beam Loads

LENGTH L (mm)	ULTIMATE LOADS - LOAD 1		DESIGN LOADS			
	LOAD Fmax (KG)	DEFLECTION Fmax (mm)	LOAD 1 F (KG)	LOAD 2 F (KG)	LOAD 3 F (KG)	LOAD 4 F (KG)
250	1731.8	0.2	*1731.8*	*865.9*	*649.4*	*432.9*
500	864.9	0.9	*864.9*	*432.5*	*324.3*	*216.2*
750	575.5	2.1	*575.5*	*287.8*	*215.8*	*143.9*
1000	430.5	3.7	*430.5*	*215.3*	*161.4*	*107.6*
1250	343.3	5.7	*343.3*	*171.6*	*128.7*	*85.8*
1500	284.9	8.2	257.3	*142.4*	94.4	67.7
1750	243.0	11.1	187.4	117.1	68.7	49.3
2000	211.4	14.4	141.8	88.6	52.0	37.3
2250	186.7	18.1	110.3	68.9	40.5	29.0
2500	166.8	22.2	87.6	54.7	32.1	23.1
2750	150.4	26.6	70.6	44.1	25.9	18.6
3000	136.6	31.4	57.6	36.0	21.1	15.2
3250	124.9	36.5	47.3	29.5	17.3	12.4
3500	114.7	41.8	38.9	24.3	14.3	10.3
3750	105.8	47.5	32.1	20.1	11.8	–
4000	98.0	53.3	26.4	16.5	–	–
4250	90.9	59.4	21.6	13.5	–	–
4500	84.6	65.6	17.4	10.9	–	–
4750	78.9	72.0	13.8	–	–	–
5000	73.7	78.4	10.6	–	–	–
5250	69.0	84.9	–	–	–	–
5500	64.6	91.4	–	–	–	–
5750	60.5	97.9	–	–	–	–
6000	56.7	104.2	–	–	–	–

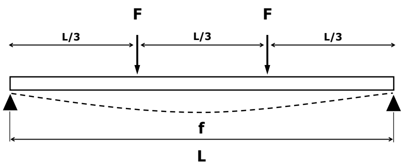
Load 1 – Uniformly Distributed Load



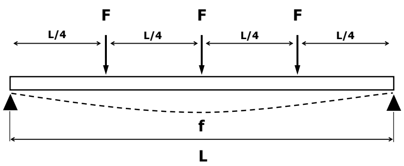
Load 2 – Centre Point Load



Load 3 – Two Point Loads



Load 4 – Three Point Loads



Notes to Beam Loads data:

- Yield Stress = 275N/mm²
- Modulus of elasticity: E = 210000N/mm²
- All beam loads are for simply supported beams
- All load data is for applied loads. The channel self-weight is already deducted
- Ultimate Loads - maximum uniformly distributed load limited by stress using safety coefficient =1.6
- Design Loads - maximum loads limited by deflection: f = L/200. *(Values in italics are limited by stress not deflection)*

HP41

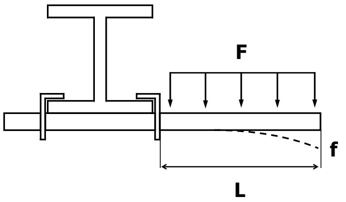
41 x 41 x 2.5 PLAIN

PRE-GALVANISED GALVANISED

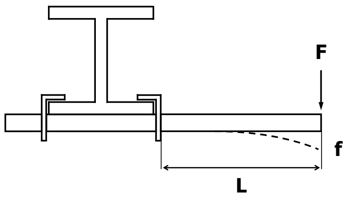
Cantilever Loads

LENGTH L (mm)	DESIGN LOADS	
	LOAD 1 F (KG)	LOAD 2 F (KG)
up to 200	*540.6*	*269.9*
300	*359.7*	*179.2*
400	*269.1*	*133.7*
500	*214.5*	*106.3*
600	*178.0*	84.0
700	151.8	61.3
800	132.1	46.5
900	116.7	36.4
1000	104.2	29.1
1100	87.7	23.6
1200	70.3	19.4
1300	56.6	16.1
1400	45.4	13.5
1500	36.1	11.3

Load 1 – Uniformly Distributed Load



Load 2 – End Point Load



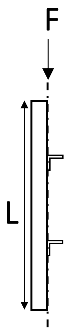
Notes to Cantilever Loads data:

- Yield Stress = $275N/mm^2$
- Modulus of elasticity: E = $210000N/mm^2$
- All load data is for applied loads. The channel self-weight is already deducted
- Design Loads - maximum loads limited by deflection: f = L/150. *(Values in italics are limited by stress using safety coefficient =1.6)*
- Load capacity of beam clamps and primary steel must be considered

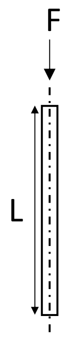
Column Loads

LENGTH L (mm)	DESIGN LOADS	
	LOAD 1 F (KG)	LOAD 2 F (KG)
500	1682.6	5426.2
750	1558.6	5071.2
1000	1409.6	3622.6
1250	1252.0	2821.5
1500	1098.9	2285.6
1750	958.3	1890.3
2000	833.8	1584.7
2250	726.0	1342.5
2500	633.9	1147.9

Load 1 – Eccentrically Loaded



Load 2 – Concentrically Loaded



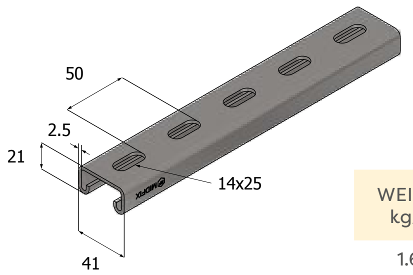
Notes to Column Loads data:

- Yield Stress = $275N/mm^2$
- Modulus of elasticity: E = $210000N/mm^2$
- Design loads include safety coefficient = 1.6
- Loads are calculated for pin-pin connections and column effective length of 1.0
- Concentric loads – loads applied at the centroid of the column (typical for beams placed on top of columns)
- Eccentric Loads – for loads applied at the open face of the channel (typical of channel bracket connections)

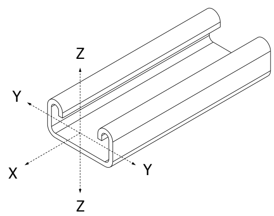
HS21

41 x 21 x 2.5 SLOTTED

PRE-GALVANISED GALVANISED



WEIGHT kg/m	MOMENT OF INERTIA		SECTION MODULUS	
	I y-y	I z-z	S y-y	S z-z
1.62	0.96cm^4	5.23cm^4	0.87cm^3	2.53cm^3



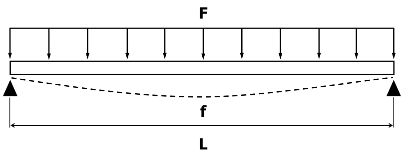
Beam Loads

LENGTH L (mm)	ULTIMATE LOADS - LOAD 1		DESIGN LOADS			
	LOAD Fmax (KG)	DEFLECTION Fmax (mm)	LOAD 1 F (KG)	LOAD 2 F (KG)	LOAD 3 F (KG)	LOAD 4 F (KG)
250	491.4	0.5	*491.4*	*245.7*	*184.3*	*122.9*
500	245.1	1.9	*245.1*	*122.6*	*91.9*	*61.3*
750	162.7	4.4	138.9	*81.4*	51.0	36.6
1000	121.3	7.7	77.2	48.2	28.3	20.3
1250	96.3	11.9	48.4	30.2	17.7	12.7
1500	79.5	17.0	32.6	20.3	11.9	–
1750	67.4	22.9	22.8	14.3	–	–
2000	58.2	29.5	16.4	10.3	–	–
2250	50.9	36.8	11.9	–	–	–
2500	45.1	44.7	–	–	–	–
2750	40.2	53.0	–	–	–	–
3000	36.0	61.7	–	–	–	–

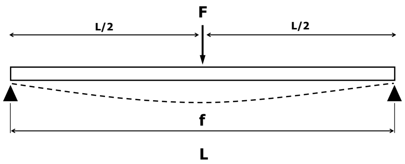
Notes to Beam Loads data:

- Yield Stress = 275N/mm^2
- Modulus of elasticity: E = 210000N/mm^2
- All beam loads are for simply supported beams
- All load data is for applied loads. The channel self-weight is already deducted
- Ultimate Loads - maximum uniformly distributed load limited by stress using safety coefficient =1.6
- Design Loads - maximum loads limited by deflection: f = L/200. *(Values in italics are limited by stress not deflection)*

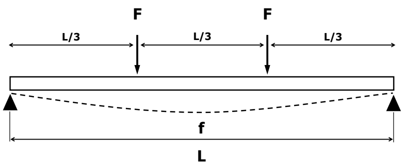
Load 1 – Uniformly Distributed Load



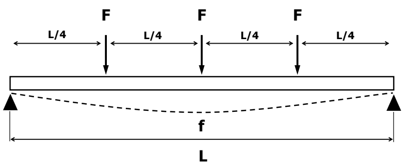
Load 2 – Centre Point Load



Load 3 – Two Point Loads



Load 4 – Three Point Loads



HS21

41 x 21 x 2.5 SLOTTED

PRE-GALVANISED GALVANISED

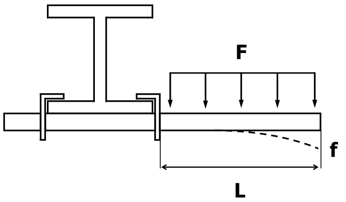
Cantilever Loads

LENGTH L (mm)	DESIGN LOADS	
	LOAD 1 F (KG)	LOAD 2 F (KG)
100	*304.6*	*152.2*
200	*151.9*	*75.7*
300	100.8	45.4
400	75.2	25.3
500	59.7	16.0
600	41.0	10.8
700	28.1	–
800	19.5	–
900	13.3	–

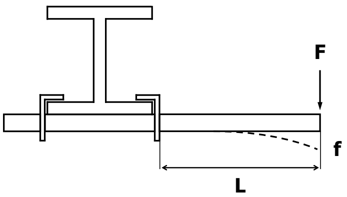
Notes to Cantilever Loads data:

- Yield Stress = 275N/mm^2
- Modulus of elasticity: E = 210000N/mm^2
- All load data is for applied loads. The channel self-weight is already deducted
- Design Loads - maximum loads limited by deflection: f = L/150. *(Values in italics are limited by stress using safety coefficient =1.6)*
- Load capacity of beam clamps and primary steel must be considered

Load 1 – Uniformly Distributed Load



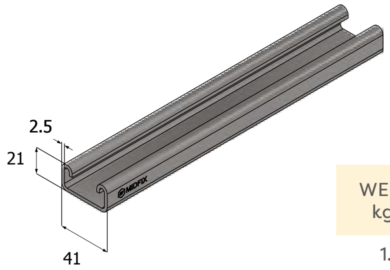
Load 2 – End Point Load



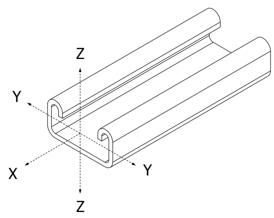
HP21

41 x 21 x 2.5 PLAIN

PRE-GALVANISED GALVANISED



WEIGHT kg/m	MOMENT OF INERTIA		SECTION MODULUS	
	I y-y	I z-z	S y-y	S z-z
1.73	1.17cm⁴	5.29cm⁴	0.96cm³	2.56cm³



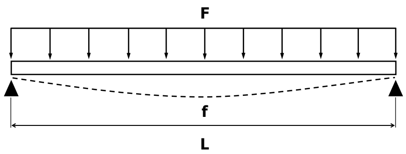
Beam Loads

LENGTH L (mm)	ULTIMATE LOADS - LOAD 1		DESIGN LOADS			
	LOAD Fmax (KG)	DEFLECTION Fmax (mm)	LOAD 1 F (KG)	LOAD 2 F (KG)	LOAD 3 F (KG)	LOAD 4 F (KG)
250	537.4	0.4	*537.4*	*268.7*	*201.5*	*134.4*
500	268.1	1.7	*268.1*	*134.0*	*100.5*	*67.0*
750	178.0	3.9	178.5	*89.0*	62.3	*44.5*
1000	132.7	6.9	94.5	59.1	34.7	24.9
1250	105.4	10.7	59.4	37.1	21.8	15.6
1500	87.0	15.2	40.1	25.1	14.7	10.6
1750	73.8	20.5	28.4	17.7	10.4	–
2000	63.7	26.5	20.5	12.8	–	–
2250	55.8	33.0	15.0	–	–	–
2500	49.4	40.1	11.0	–	–	–
2750	44.0	47.6	–	–	–	–
3000	39.5	55.4	–	–	–	–

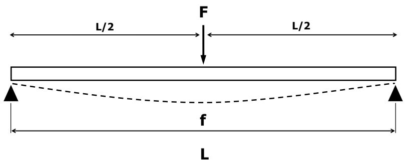
Notes to Beam Loads data:

- Yield Stress = 275N/mm²
- Modulus of elasticity: E = 210000N/mm²
- All beam loads are for simply supported beams
- All load data is for applied loads. The channel self-weight is already deducted
- Ultimate Loads - maximum uniformly distributed load limited by stress using safety coefficient =1.6
- Design Loads - maximum loads limited by deflection: f = L/200. *(Values in italics are limited by stress not deflection)*

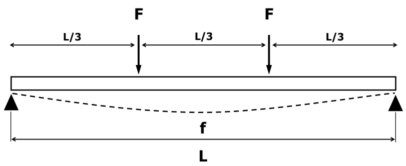
Load 1 – Uniformly Distributed Load



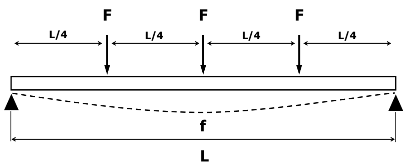
Load 2 – Centre Point Load



Load 3 – Two Point Loads



Load 4 – Three Point Loads



HP21

41 x 21 x 2.5 PLAIN

PRE-GALVANISED GALVANISED

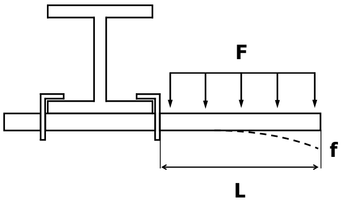
Cantilever Loads

LENGTH L (mm)	DESIGN LOADS LOAD 1 F (KG)	LOAD 2 F (KG)
100	*336.1*	*167.9*
200	*167.6*	*83.5*
300	111.3	55.2
400	83.0	30.9
500	65.9	19.5
600	50.7	13.3
700	35.1	–
800	24.7	–
900	17.3	–

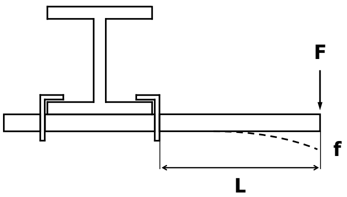
Notes to Cantilever Loads data:

- Yield Stress = 275N/mm^2
- Modulus of elasticity: E = 210000N/mm^2
- All load data is for applied loads. The channel self-weight is already deducted
- Design Loads - maximum loads limited by deflection: f = L/150. *(Values in italics are limited by stress using safety coefficient =1.6)*
- Load capacity of beam clamps and primary steel must be considered

Load 1 – Uniformly Distributed Load



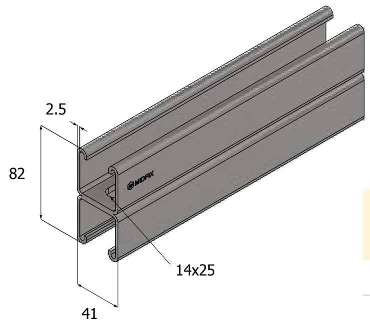
Load 2 – End Point Load



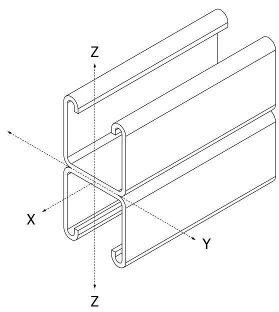
HB41/S

41 x 41 x 2.5 BACK TO BACK SLOTTED

PRE-GALVANISED GALVANISED



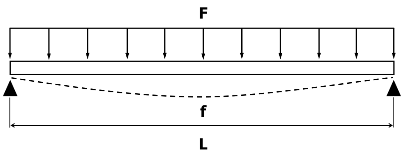
WEIGHT kg/m	MOMENT OF INERTIA		SECTION MODULUS	
	I y-y	I z-z	S y-y	S z-z
4.59	36.34cm^4	18.27cm^4	8.79cm^3	8.85cm^3



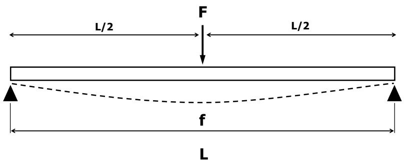
Beam Loads

LENGTH L (mm)	ULTIMATE LOADS - LOAD 1		DESIGN LOADS			
	LOAD Fmax (KG)	DEFLECTION Fmax (mm)	LOAD 1 F (KG)	LOAD 2 F (KG)	LOAD 3 F (KG)	LOAD 4 F (KG)
250	4931.5	0.1	*4931.5*	*2465.7*	*1849.3*	*1232.9*
500	2464.0	0.5	*2464.0*	*1232.0*	*924.0*	*616.0*
750	1640.7	1.2	*1640.7*	*820.4*	*615.3*	*410.2*
1000	1228.5	2.1	*1228.5*	*614.2*	*460.7*	*307.1*
1250	980.7	3.2	*980.7*	*490.3*	*367.8*	*245.2*
1500	815.1	4.6	*815.1*	*407.5*	*305.7*	*203.8*
1750	696.5	6.2	*696.5*	*348.2*	*261.2*	*174.1*
2000	607.2	8.1	*607.2*	*303.6*	*227.7*	*151.8*
2250	537.5	10.2	*537.5*	*268.8*	*201.6*	*134.4*
2500	481.6	12.6	466.2	*240.8*	171.0	*120.4*
2750	435.6	15.2	382.1	*217.8*	140.2	100.6
3000	397.0	17.9	317.8	*198.5*	116.6	83.7
3250	364.2	20.9	267.6	167.2	98.2	70.4
3500	336.0	24.1	227.5	142.2	83.4	59.9
3750	311.3	27.5	194.9	121.8	71.5	51.3
4000	289.6	31.0	168.0	105.0	61.6	44.2
4250	270.3	34.7	145.5	90.9	53.4	38.3
4500	253.0	38.6	126.4	79.0	46.4	33.3
4750	237.4	42.6	110.2	68.8	40.4	29.0
5000	223.2	46.7	96.1	60.1	35.2	25.3
5250	210.3	50.9	83.8	52.4	30.7	22.1
5500	198.5	55.3	73.0	45.6	26.8	19.2
5750	187.6	59.7	63.4	39.6	23.3	16.7
6000	177.5	64.2	54.9	34.3	20.1	14.5

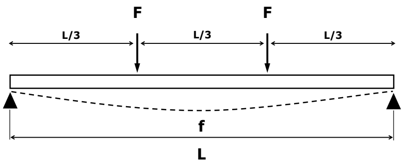
Load 1 – Uniformly Distributed Load



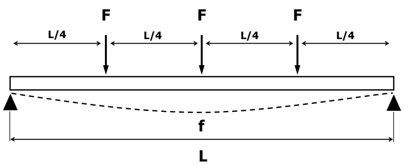
Load 2 – Centre Point Load



Load 3 – Two Point Loads



Load 4 – Three Point Loads



Notes to Beam Loads data:

- Yield Stress = 275N/mm^2
- Modulus of elasticity: E = 210000N/mm^2
- All beam loads are for simply supported beams
- All load data is for applied loads. The channel self-weight is already deducted
- Ultimate Loads - maximum uniformly distributed load limited by stress using safety coefficient =1.6
- Design Loads - maximum loads limited by deflection: f = L/200. *(Values in italics are limited by stress not deflection)*

HB41/S

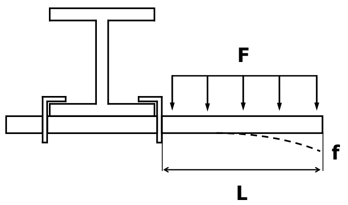
41 x 41 x 2.5 BACK TO BACK SLOTTED

PRE-GALVANISED GALVANISED

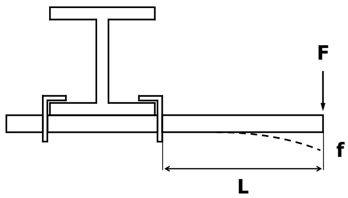
Cantilever Loads

LENGTH L (mm)	DESIGN LOADS LOAD 1 F (KG)	LOAD 2 F (KG)
up to 500	*612.3*	*304.3*
600	*508.9*	*252.3*
700	*434.9*	*214.9*
800	*379.1*	*186.6*
900	*335.6*	*164.5*
1000	*300.7*	*146.7*
1100	*271.9*	125.6
1200	*247.9*	104.7
1300	*227.4*	88.5
1400	*209.7*	75.5
1500	*194.3*	65.0

Load 1 – Uniformly Distributed Load



Load 2 – End Point Load



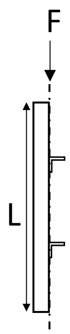
Notes to Cantilever Loads data:

- Yield Stress = 275N/mm²
- Modulus of elasticity: E = 210000N/mm²
- All load data is for applied loads. The channel self-weight is already deducted
- Design Loads - maximum loads limited by deflection: f = L/150. *(Values in italics are limited by stress using safety coefficient =1.6)*
- Load capacity of beam clamps and primary steel must be considered

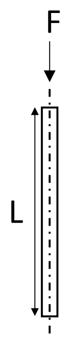
Column Loads

LENGTH L (mm)	DESIGN LOADS LOAD 1 F (KG)	LOAD 2 F (KG)
500	2671.2	12632.3
750	2604.1	12384.6
1000	2515.0	11908.3
1250	2408.2	8809.0
1500	2288.5	7034.3
1750	2160.4	5880.3
2000	2028.4	5056.6
2250	1896.1	4427.3
2500	1766.5	3922.7
2750	1641.7	3504.4
2950	1546.5	3216.3

Load 1 – Eccentrically Loaded



Load 2 – Concentrically Loaded



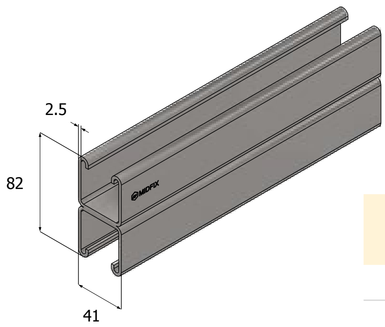
Notes to Column Loads data:

- Yield Stress = 275N/mm²
- Modulus of elasticity: E = 210000N/mm²
- Design loads include safety coefficient = 1.6
- Loads are calculated for pin-pin connections and column effective length of 1.0
- Concentric loads – loads applied at the centroid of the column (typical for beams placed on top of columns)
- Eccentric Loads – for loads applied at the open face of the channel (typical of channel bracket connections)

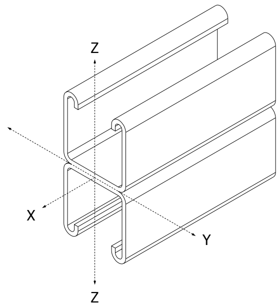
HB41/P

41 x 41 x 2.5 BACK TO BACK PLAIN

PRE-GALVANISED GALVANISED



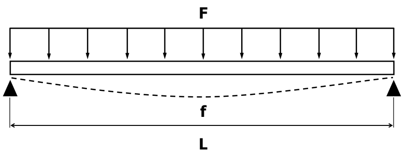
WEIGHT kg/m	MOMENT OF INERTIA		SECTION MODULUS	
	I y-y	I z-z	S y-y	S z-z
5.00	36.35cm⁴	18.39cm⁴	8.80cm⁴	8.90cm⁴



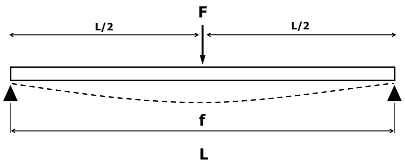
Beam Loads

LENGTH L (mm)	ULTIMATE LOADS - LOAD 1		DESIGN LOADS			
	LOAD Fmax (KG)	DEFLECTION Fmax (mm)	LOAD 1 F (KG)	LOAD 2 F (KG)	LOAD 3 F (KG)	LOAD 4 F (KG)
250	4933.3	0.1	*4933.3*	*2466.7*	*1850.0*	*1233.3*
500	2464.8	0.5	*2464.8*	*1232.4*	*924.3*	*616.2*
750	1641.0	1.2	*1641.0*	*820.5*	*615.4*	*410.3*
1000	1228.6	2.1	*1228.6*	*614.3*	*460.7*	*307.1*
1250	980.6	3.2	*980.6*	*490.3*	*367.7*	*245.1*
1500	814.8	4.6	*814.8*	*407.4*	*305.5*	*203.7*
1750	696.0	6.2	*696.0*	*348.0*	*261.0*	*174.0*
2000	606.6	8.1	*606.6*	*303.3*	*227.5*	*151.7*
2250	536.8	10.2	*536.8*	*268.4*	*201.3*	*134.2*
2500	480.7	12.6	465.3	*240.4*	170.7	*120.2*
2750	434.6	15.1	381.1	*217.3*	139.8	100.3
3000	395.9	17.9	316.7	197.9	116.2	83.4
3250	363.0	20.9	266.3	166.5	97.7	70.1
3500	334.6	24.0	226.1	141.3	82.9	59.5
3750	309.9	27.3	193.4	120.9	70.9	50.9
4000	288.0	30.8	166.4	104.0	61.0	43.8
4250	268.6	34.5	143.8	89.9	52.7	37.9
4500	251.2	38.3	124.6	77.9	45.7	32.8
4750	235.5	42.2	108.2	67.6	39.7	28.5
5000	221.2	46.3	94.0	58.8	34.5	24.8
5250	208.2	50.4	81.7	51.0	30.0	21.5
5500	196.3	54.6	70.7	44.2	26.0	18.6
5750	185.2	58.9	61.1	38.2	22.4	16.1
6000	175.0	63.3	52.4	32.8	19.2	13.8

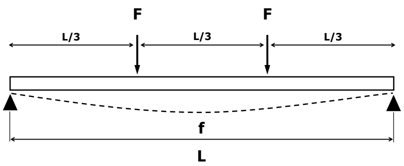
Load 1 – Uniformly Distributed Load



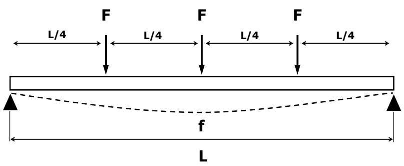
Load 2 – Centre Point Load



Load 3 – Two Point Loads



Load 4 – Three Point Loads



Notes to Beam Loads data:

- Yield Stress = 275N/mm²
- Modulus of elasticity: E = 210000N/mm²
- All beam loads are for simply supported beams
- All load data is for applied loads. The channel self-weight is already deducted
- Ultimate Loads - maximum uniformly distributed load limited by stress using safety coefficient =1.6
- Design Loads - maximum loads limited by deflection: f = L/200. *(Values in italics are limited by stress not deflection)*

HB41/P

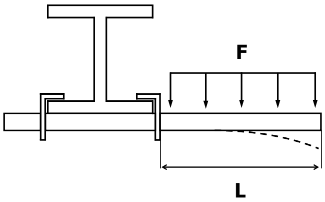
41 x 41 x 2.5 BACK TO BACK PLAIN

PRE-GALVANISED GALVANISED

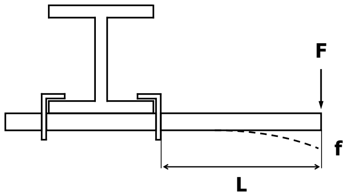
Cantilever Loads

LENGTH L (mm)	DESIGN LOADS	
	LOAD 1 F (KG)	LOAD 2 F (KG)
up to 500	*613.0*	*304.7*
600	*509.5*	*252.6*
700	*435.4*	*215.1*
800	*379.6*	*186.8*
900	*336.0*	*164.7*
1000	*301.0*	*146.8*
1100	*272.2*	125.6
1200	*248.2*	104.8
1300	*227.7*	88.5
1400	*210.0*	75.5
1500	*194.6*	65.0

Load 1 – Uniformly Distributed Load



Load 2 – End Point Load



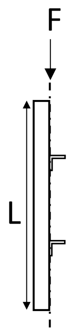
Notes to Cantilever Loads data:

- Yield Stress = 275N/mm²
- Modulus of elasticity: E = 210000N/mm²
- All load data is for applied loads. The channel self-weight is already deducted
- Design Loads - maximum loads limited by deflection: f = L/150. *(Values in italics are limited by stress using safety coefficient =1.6)*
- Load capacity of beam clamps and primary steel must be considered

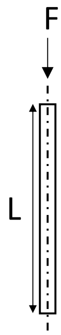
Column Loads

LENGTH L (mm)	DESIGN LOADS	
	LOAD 1 F (KG)	LOAD 2 F (KG)
500	2744.4	12892.5
750	2671.8	12639.7
1000	2575.9	12153.5
1250	2461.6	8976.6
1500	2334.1	7155.8
1750	2198.7	5971.1
2000	2060.0	5125.5
2250	1921.9	4480.0
2500	1787.3	3963.2
2750	1658.5	3535.6
2950	1560.5	3241.6

Load 1 – Eccentrically Loaded



Load 2 – Concentrically Loaded



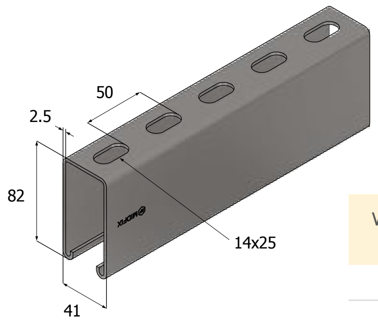
Notes to Column Loads data:

- Yield Stress = 275N/mm²
- Modulus of elasticity: E = 210000N/mm²
- Design loads include safety coefficient = 1.6
- Loads are calculated for pin-pin connections and column effective length of 1.0
- Concentric loads – loads applied at the centroid of the column (typical for beams placed on top of columns)
- Eccentric Loads – for loads applied at the open face of the channel (typical of channel bracket connections)

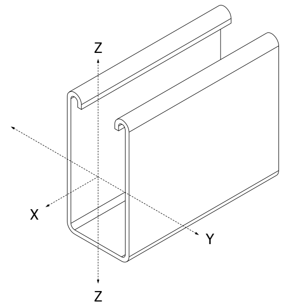
HS82

41 x 82 x 2.5 SLOTTED

PRE-GALVANISED



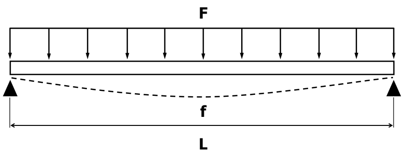
WEIGHT kg/m	MOMENT OF INERTIA		SECTION MODULUS	
	I y-y	I z-z	S y-y	S z-z
3.87	37.49cm⁴	16.92cm⁴	8.98cm³	8.19cm³



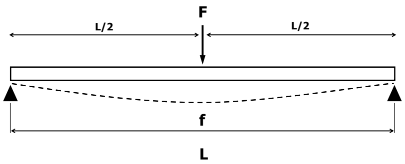
Beam Loads

LENGTH L (mm)	ULTIMATE LOADS - LOAD 1		DESIGN LOADS			
	LOAD Fmax (KG)	DEFLECTION Fmax (mm)	LOAD 1 F (KG)	LOAD 2 F (KG)	LOAD 3 F (KG)	LOAD 4 F (KG)
250	3871.5	0.1	*3871.5*	*1935.8*	*1451.8*	*967.9*
500	1934.3	0.4	*1934.3*	*967.1*	*725.4*	*483.6*
750	1287.9	0.9	*1287.9*	*643.9*	*483.0*	*322.0*
1000	964.2	1.6	*964.2*	*482.1*	*361.6*	*241.0*
1250	769.6	2.4	*769.6*	*384.8*	*288.6*	*192.4*
1500	639.5	3.5	*639.5*	*319.8*	*239.8*	*159.9*
1750	546.3	4.8	*546.3*	*273.2*	*204.9*	*136.6*
2000	476.2	6.2	*476.2*	*238.1*	*178.6*	*119.0*
2250	421.4	7.8	*421.4*	*210.7*	*158.0*	*105.4*
2500	377.4	9.6	*377.4*	*188.7*	*141.5*	*94.3*
2750	341.2	11.5	*341.2*	*170.6*	*127.9*	*85.3*
3000	310.9	13.6	*310.9*	*155.4*	*116.6*	*77.7*
3250	285.1	15.9	279.0	*142.5*	102.3	*71.3*
3500	262.8	18.3	237.8	*131.4*	87.2	62.6
3750	243.4	20.8	204.4	*121.7*	75.0	53.8
4000	226.3	23.5	176.8	110.5	64.9	46.6
4250	211.0	26.3	153.9	96.2	56.4	40.5
4500	197.4	29.2	134.4	84.0	49.3	35.4
4750	185.1	32.2	117.9	73.7	43.2	31.0
5000	173.9	35.3	103.6	64.7	38.0	27.3
5250	163.7	38.4	91.1	56.9	33.4	24.0
5500	154.3	41.7	80.2	50.1	29.4	21.1
5750	145.7	44.9	70.5	44.1	25.9	18.6
6000	137.7	48.2	61.9	38.7	22.7	16.3

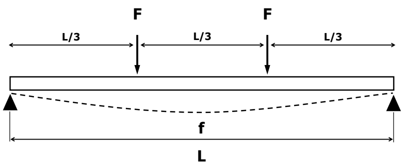
Load 1 – Uniformly Distributed Load



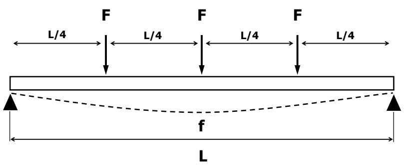
Load 2 – Centre Point Load



Load 3 – Two Point Loads



Load 4 – Three Point Loads



Notes to Beam Loads data:

- Yield Stress = 280N/mm²
- Modulus of elasticity: E = 210000N/mm²
- All beam loads are for simply supported beams
- All load data is for applied loads. The channel self-weight is already deducted
- Ultimate Loads - maximum uniformly distributed load limited by stress using safety coefficient =2.12
- Design Loads - maximum loads limited by deflection: f = L/200. *(Values in italics are limited by stress not deflection)*

HS82

41 x 82 x 2.5 SLOTTED

PRE-GALVANISED

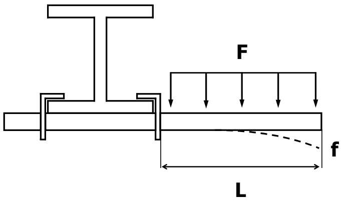
Cantilever Loads

LENGTH L (mm)	DESIGN LOADS LOAD 1 F (KG)	LOAD 2 F (KG)
up to 500	*479.5*	*237.7*
600	*398.1*	*196.6*
700	*339.7*	*167.0*
800	*295.7*	*144.6*
900	*261.3*	*127.0*
1000	*233.6*	*112.7*
1100	*210.8*	*100.9*
1200	*191.7*	*90.9*
1300	*175.3*	*82.3*
1400	*161.2*	*74.9*
1500	*148.9*	66.7

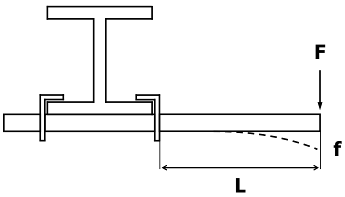
Notes to Cantilever Loads data:

- Yield Stress = 280N/mm^2
- Modulus of elasticity: E = 210000N/mm^2
- All load data is for applied loads. The channel self-weight is already deducted
- Design Loads - maximum loads limited by deflection: f = L/150. *(Values in italics are limited by stress using safety coefficient =2.12)*
- Load capacity of beam clamps and primary steel must be considered

Load 1 – Uniformly Distributed Load



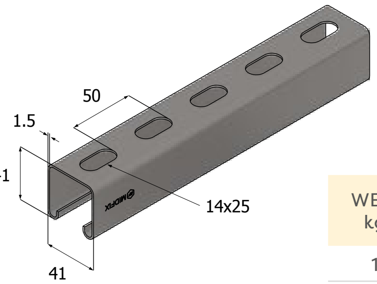
Load 2 – End Point Load



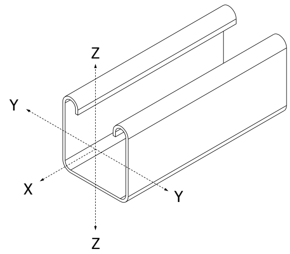
LS41

41 x 41 x 1.5 SLOTTED

PRE-GALVANISED



WEIGHT kg/m	MOMENT OF INERTIA		SECTION MODULUS	
	I y-y	I z-z	S y-y	S z-z
1.52	3.95cm⁴	5.88cm⁴	1.89cm³	2.84cm³



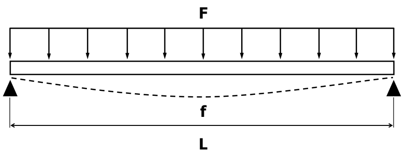
Beam Loads

LENGTH L (mm)	ULTIMATE LOADS - LOAD 1		DESIGN LOADS			
	LOAD Fmax (KG)	DEFLECTION Fmax (mm)	LOAD 1 F (KG)	LOAD 2 F (KG)	LOAD 3 F (KG)	LOAD 4 F (KG)
250	1078.5	0.3	*1078.5*	*539.3*	*404.4*	*269.6*
500	538.7	1.0	*538.7*	*269.3*	*202.0*	*134.7*
750	358.5	2.3	*358.5*	*179.2*	*134.4*	*89.6*
1000	268.2	4.1	*268.2*	*134.1*	*100.6*	*67.0*
1250	213.8	6.4	206.4	*106.9*	75.7	*53.5*
1500	177.5	9.2	142.3	*88.7*	52.2	37.5
1750	151.4	12.5	103.6	64.7	38.0	27.3
2000	131.8	16.2	78.3	48.9	28.7	20.6
2250	116.4	20.4	60.8	38.0	22.3	16.0
2500	104.0	25.0	48.2	30.1	17.7	12.7
2750	93.8	30.0	38.8	24.2	14.2	10.2
3000	85.3	35.4	31.5	19.7	11.6	–

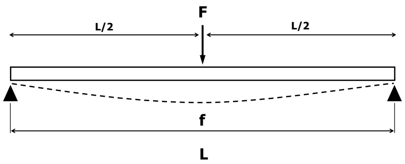
Notes to Beam Loads data:

- Yield Stress = 280N/mm²
- Modulus of elasticity: E = 210000N/mm²
- All beam loads are for simply supported beams
- All load data is for applied loads. The channel self-weight is already deducted
- Ultimate Loads - maximum uniformly distributed load limited by stress using safety coefficient =1.6
- Design Loads - maximum loads limited by deflection: f = L/200. *(Values in italics are limited by stress not deflection)*

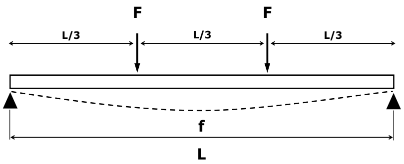
Load 1 – Uniformly Distributed Load



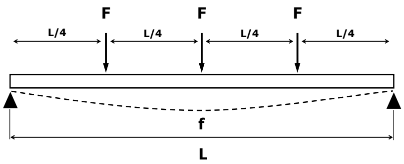
Load 2 – Centre Point Load



Load 3 – Two Point Loads



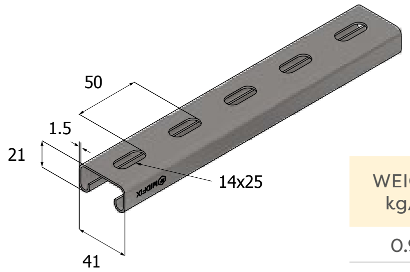
Load 4 – Three Point Loads



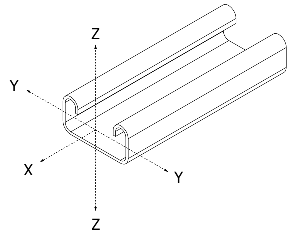
LS21

41 x 21 x 1.5 SLOTTED

PRE-GALVANISED



WEIGHT kg/m	MOMENT OF INERTIA		SECTION MODULUS	
	I y-y	I z-z	S y-y	S z-z
0.97	0.66cm^4	3.42cm^4	0.61cm^3	1.65cm^3



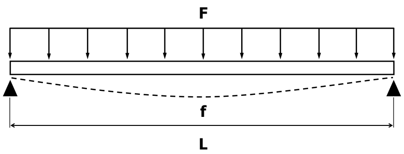
Beam Loads

	ULTIMATE LOADS - LOAD 1		DESIGN LOADS			
LENGTH L (mm)	LOAD Fmax (KG)	DEFLECTION Fmax (mm)	LOAD 1 F (KG)	LOAD 2 F (KG)	LOAD 3 F (KG)	LOAD 4 F (KG)
250	352.9	0.5	*352.9*	*176.4*	*132.3*	*88.2*
500	176.1	2.0	*176.1*	*88.0*	*66.0*	*44.0*
750	117.0	4.5	97.0	*58.5*	35.6	25.5
1000	87.3	7.9	54.0	33.7	19.8	14.2
1250	69.4	12.3	34.0	21.2	12.5	–
1500	57.4	17.6	23.0	14.3	–	–
1750	48.7	23.7	16.2	10.1	–	–
2000	42.2	30.7	11.8	–	–	–
2250	37.0	38.3	–	–	–	–
2500	32.8	46.7	–	–	–	–
2750	29.4	55.6	–	–	–	–
3000	26.5	65.0	–	–	–	–

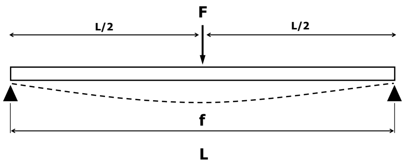
Notes to Beam Loads data:

- Yield Stress = 280N/mm^2
- Modulus of elasticity: E = 210000N/mm^2
- All beam loads are for simply supported beams
- All load data is for applied loads. The channel self-weight is already deducted
- Ultimate Loads - maximum uniformly distributed load limited by stress using safety coefficient =1.6
- Design Loads - maximum loads limited by deflection: f = L/200. *(Values in italics are limited by stress not deflection)*

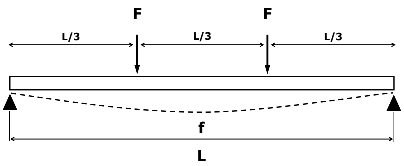
Load 1 – Uniformly Distributed Load



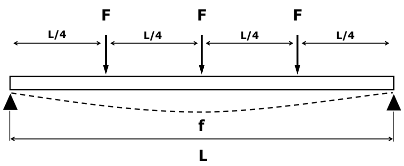
Load 2 – Centre Point Load



Load 3 – Two Point Loads



Load 4 – Three Point Loads



MX Trapeze Brackets

MX TRAPEZE BRACKET LOAD DATA

Trapeze brackets are used for suspending a wide range of building services from ceilings and are the most common bracket type used in the M&E sector. These supports are almost always 'safety critical' where failure could result in significant damage or injury.

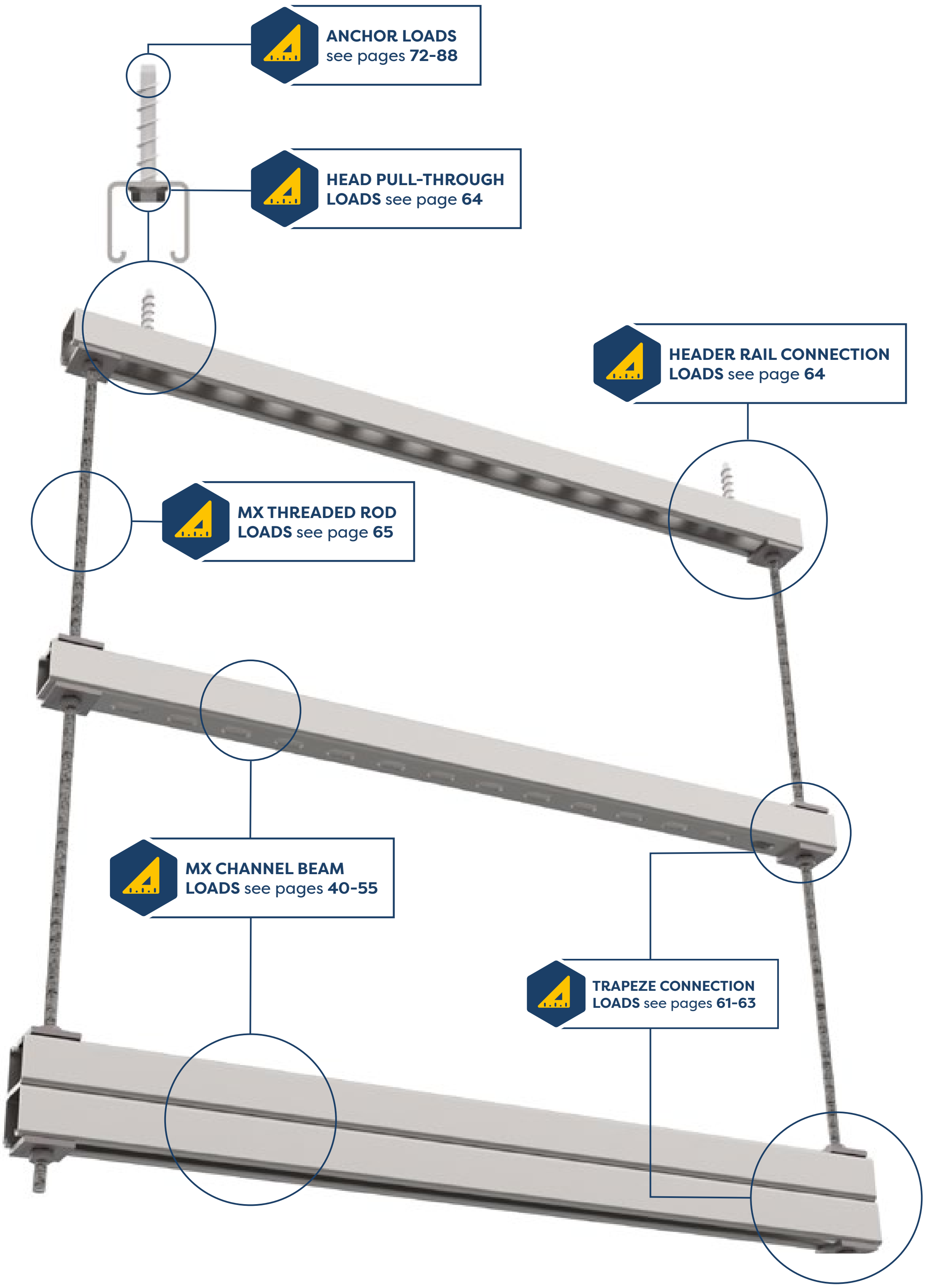
Trapeze brackets can be used to support individual or multiple services on single or multiple levels. Loads vary from lightweight electrical services to the significant loads of large pipework or cable ladders.

MX Channel System comes with comprehensive load data specifically for use in trapeze bracket design. With MX the bracket designer can design a wide range of trapezes and evidence they are fit for purpose and safe for the loads they carry.
The availability of this data also means the designer can optimise designs and reduce the costs of brackets that are over-engineered for the loads they are supporting.

TRAPEZE BRACKETS

THREADED ROD TYPE

Representative design referenced to the relevant load data page for each element of a MX threaded rod trapeze bracket.

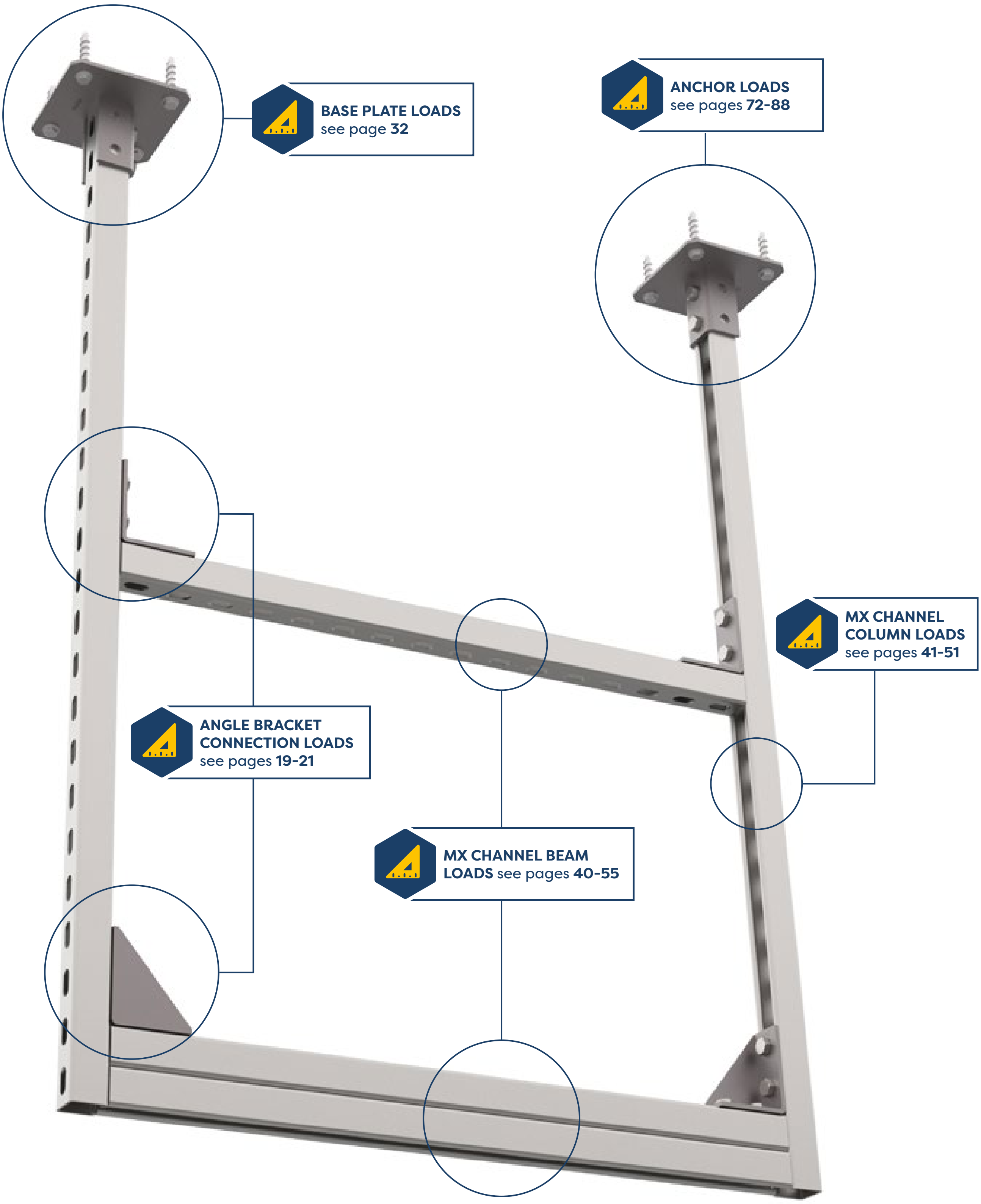


MIDFIX MX TRAPEZE BRACKETS

TRAPEZE BRACKETS

CHANNEL TYPE

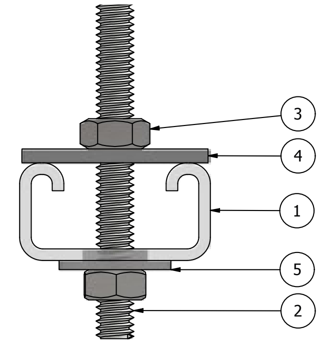
Representative design referenced to the relevant load data page for each element of a MX channel trapeze bracket.



MIDFIX MX TRAPEZE BRACKETS

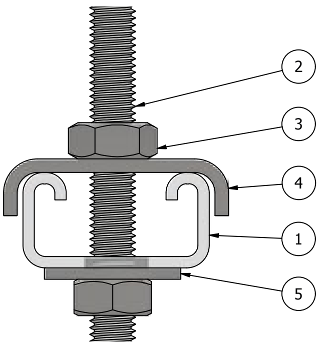
TRAPEZE CONNECTION LOADS

CONNECTION REFERENCE	MAX SAFE LOAD F_Z (KG)
M8TBC1	237



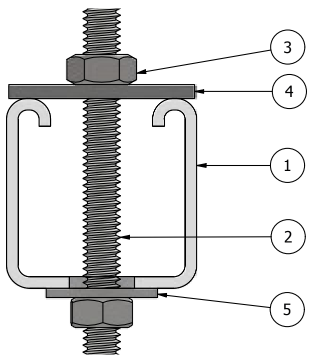
PARTS LIST	
ITEM	DESCRIPTION
1	HS21 MX Channel
2	M8 MX Threaded Rod
3	M8 DIN 934 Nuts - Class 8
4	FB100/8 MX Channel Plate
5	M8x25x1.5 Penny Washer

CONNECTION REFERENCE	MAX SAFE LOAD F_Z (KG)
M10TBC1	326



PARTS LIST	
ITEM	DESCRIPTION
1	HS21 MX Channel
2	M10 MX Threaded Rod
3	M10 DIN 934 Nuts - Class 8
4	FB099/10 MX Lipped Washer
5	M10x25x1.5 Penny Washer

CONNECTION REFERENCE	MAX SAFE LOAD F_Z (KG)
M8TBC2	237

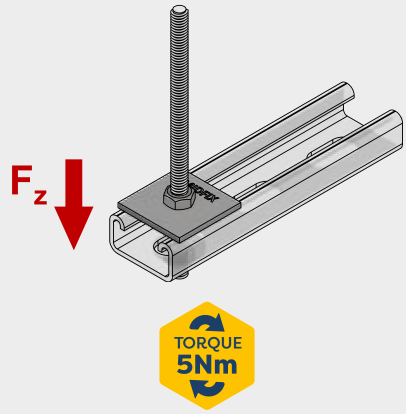


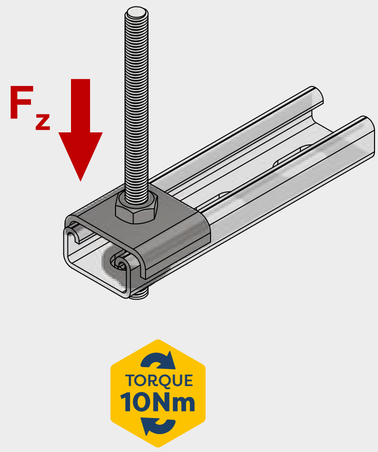
PARTS LIST	
ITEM	DESCRIPTION
1	HS41 MX Channel
2	M8 MX Threaded Rod
3	M8 DIN 934 Nuts - Class 8
4	FB100/8 MX Channel Plate
5	M8x25x1.5 Penny Washer

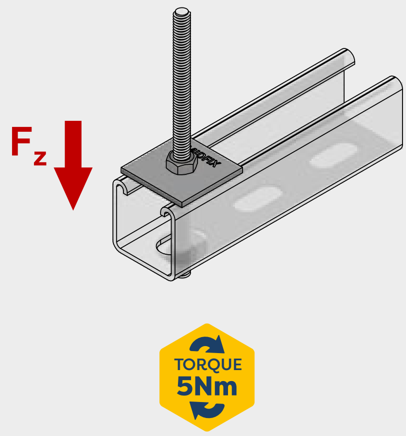
MAXIMUM SAFE LOADS

Loads apply to the specific connection designs illustrated with:

1) Components as specified
2) Torque values as specified
3) Threaded rod enclosed within full slot



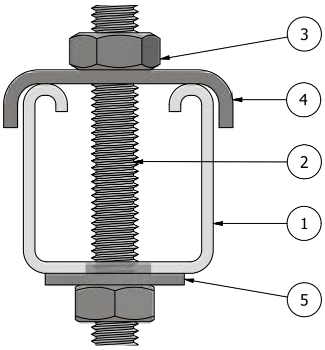




MIDFIX MX TRAPEZE BRACKETS

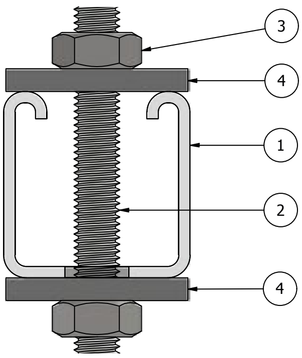
TRAPEZE CONNECTION LOADS

CONNECTION REFERENCE	MAX SAFE LOAD F_Z (KG)
M10TBC2	326



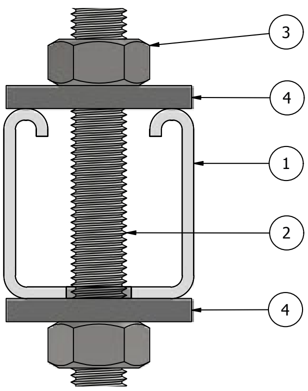
PARTS LIST	
ITEM	DESCRIPTION
1	HS41 MX Channel
2	M10 MX Threaded Rod
3	M10 DIN 934 Nuts - Class 8
4	FB099/10 MX Lipped Washer
5	M10x25x1.5 Penny Washer

CONNECTION REFERENCE	MAX SAFE LOAD F_Z (KG)
M10TBC3	689



PARTS LIST	
ITEM	DESCRIPTION
1	HS41 MX Channel
2	M10 MX Threaded Rod
3	M10 DIN 934 Nuts - Class 8
4	FB101/10 MX Channel Washer

CONNECTION REFERENCE	MAX SAFE LOAD F_Z (KG)
M12TBC3	689

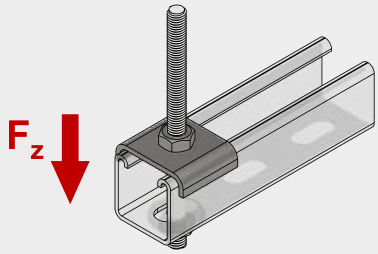


PARTS LIST	
ITEM	DESCRIPTION
1	HS41 MX Channel
2	M12 MX Threaded Rod
3	M12 DIN 934 Nuts - Class 8
4	FB101/12 MX Channel Washer

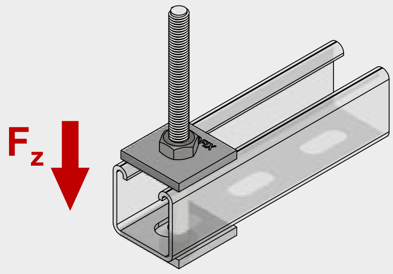
MAXIMUM SAFE LOADS

Loads apply to the specific connection designs illustrated with:

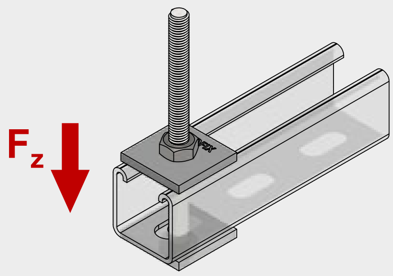
1) **Components as specified**
2) **Torque values as specified**
3) **Threaded rod enclosed within full slot**



TORQUE
10Nm



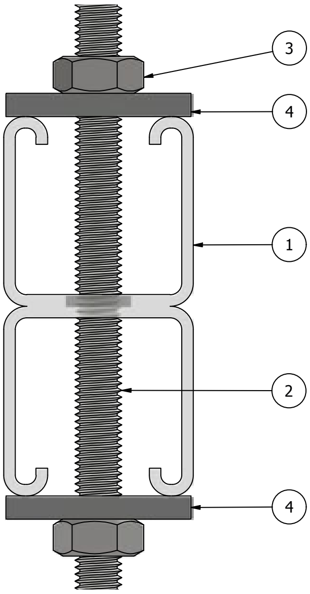
TORQUE
25Nm



TORQUE
25Nm

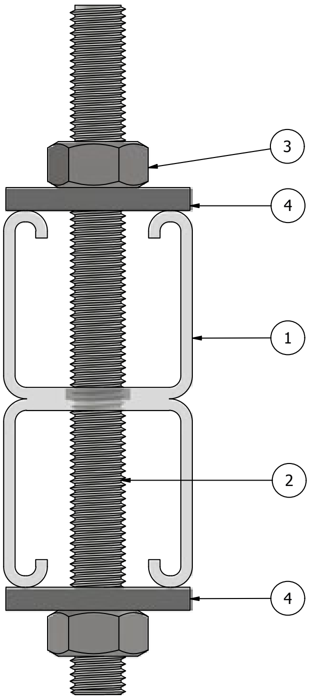
TRAPEZE CONNECTION LOADS

CONNECTION REFERENCE	MAX SAFE LOAD F_Z (KG)
M10TBC4	703



PARTS LIST	
ITEM	DESCRIPTION
1	HB41S MX Channel
2	M10 MX Threaded Rod
3	M10 DIN 934 Nuts - Class 8
4	FB101/10 MX Channel Washer

CONNECTION REFERENCE	MAX SAFE LOAD F_Z (KG)
M12TBC4	703



PARTS LIST	
ITEM	DESCRIPTION
1	HB41S MX Channel
2	M12 MX Threaded Rod
3	M12 DIN 934 Nuts - Class 8
4	FB101/12 MX Channel Washer

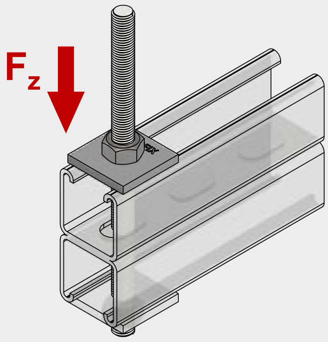
MAXIMUM SAFE LOADS

Loads apply to the specific connection designs illustrated with:

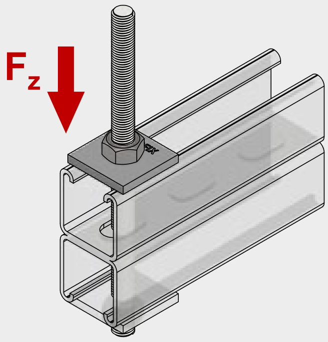
1) Components as specified

2) Torque values as specified

3) Threaded rod enclosed within full slot



TORQUE 25Nm

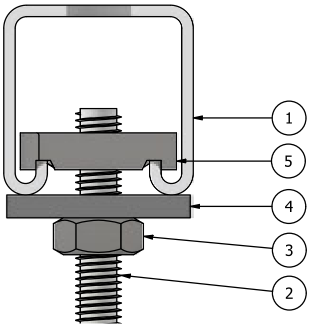


TORQUE 25Nm

MIDFIX MX TRAPEZE BRACKETS

HEADER RAIL CONNECTION LOADS

ROD SIZE	TORQUE NM	MAX SAFE LOAD F_Z (KG)
M8	10	400
M10	25	584
M12	25	584

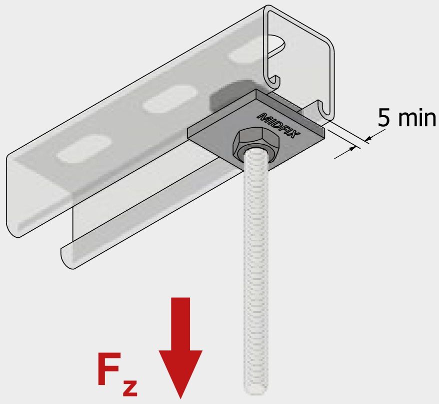


PARTS LIST	
ITEM	**DESCRIPTION**
1	MX 2.5mm Channel
2	MX Threaded Rod
3	DIN 934 Nut - Class 8
4	FB101 MX Channel Washer
5	MX Channel Nut

MAXIMUM SAFE LOADS

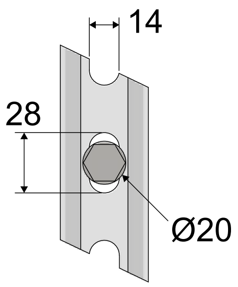
Loads apply to connection design illustrated with:

1) **Components as specified**
2) **Torque values as specified**

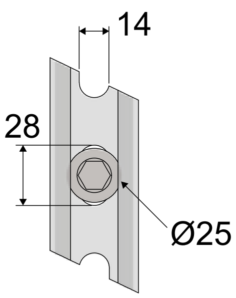


ANCHOR HEAD PULL-THROUGH LOADS

REFERENCE	FIXING OPTIONS		*MAX SAFE LOAD F_Z (KN)	*MAX SAFE LOAD F_Z (KG)
	FIXING	WASHER		
D20-APT	M10 Hexagon Set Screw	M10 DIN 125	4.57	466
	M10 Throughbolt	M10 DIN 125		
	MCS10-HX MIDFIX Concrete Screw	Not Required		



REFERENCE	FIXING OPTIONS		*MAX SAFE LOAD F_Z (KN)	*MAX SAFE LOAD F_Z (KG)
	FIXING	WASHER		
D25-APT	MCS6-HX MIDFIX Concrete Screw	M8x25x1.5 Penny Washer	5.17	527
	MCS8-HX MIDFIX Concrete Screw	M10x25x1.5 Penny Washer		
	MCS6-LP MIDFIX Concrete Screw	M8x25x1.5 Penny Washer		



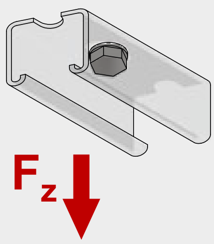
MAXIMUM SAFE LOADS

These loads solely apply to the head of the fixing or anchor pulling through the slot of the channel.

IT IS ALSO ESSENTIAL TO CONSIDER THE APPROVED LOAD FOR THE ANCHOR TO DETERMINE THE LIMITING FACTOR THAT APPLIES.

Loads apply to:

1) **The fixing/washer combinations listed**
2) **MX 2.5mm slotted channel**



MX THREADED ROD LOADS

SIZE	*1 MAX SAFE LOAD F_Z (KG)	*2 MAX SAFE LOAD F_Z (KG)
M8	447	400
M10	793	584
M12	1443	584

For **MX THREADED ROD PRODUCT DATA** see page 35

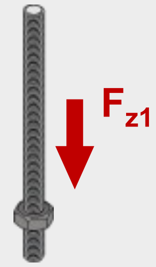
MAXIMUM SAFE LOADS

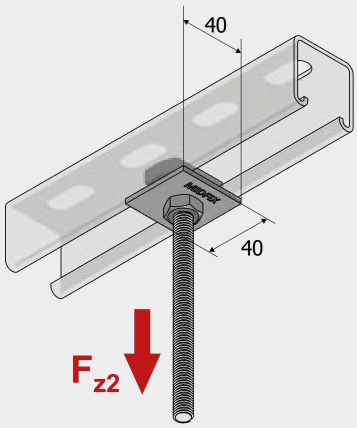
FOR MX THREADED ROD WITH ZINC PLATED AND GALVANISED FINISHES.

*1 Load – safe static tensile load for MX threaded rod combined with DIN 934 Grade 8 nut.

*2 Load – safe static tensile load for MX threaded rod combined with:

1) **MX 2.5mm channel**
2) **MX Channel Nut**
3) **MX FB101 Channel Plate Washer**
4) **DIN 934 Class 8 Nut**





MIDFIX

Anchor Fixings System

MIDFIX ANCHOR PROGRAMME

Anchors and fixings are critical components in building services supports. Using the right products that have been correctly installed is vital to guarantee the safety of the installation.

The MIDFIX Anchor Programme is specifically designed to meet the needs of the M&E sector and includes a complete package of products, testing and training.

This means high quality anchors with suitable approvals, site testing to prove and evidence anchor performance, technical support, and industry leading training for supervisors and installers.

The MIDFIX Anchor System integrates with the MX Channel System meaning the supports and anchors can be considered together and specified from a single source.

ANCHOR COMPLIANCE

With legislation driving unprecedented change in the construction industry, the requirement for anchor compliance is no longer an option. This is understandable when we consider the 'safety critical' nature of anchors and the services that depend on them.

What is 'Safety Critical'?

If the failure of an anchor could lead to collapse of the services and injury, death, or significant material or economic damage to the building, then the situation is classified as 'safety critical'.

With the majority of building services installations being suspended in overhead applications, the anchors are clearly 'safety critical' components and covered in BS 8539: 2012.

ANCHOR COMPLIANCE CONT.

What is BS 8539:2012 ?

BS 8539:2012 is the code of practice for the selection and installation of anchors. It has become the industry standard for achieving safe and compliant anchor installations and sets out the responsibilities of everyone involved from the anchor specifier to the installer.

Some key requirements within the standard are:

- Approved anchors should be used whenever there is one available.
- Training for supervisors and installers to ensure the anchors are installed correctly.

MIDFIX delivers CPD's and training to assist contractors with implementing BS 8539. 'The MIDFIX Guide to a Compliant BS:8539 Fixing Installation' provides comprehensive information on the route to achieving compliance.

The Building Safety Act 2022

This new legislation has huge implications for the whole construction industry. The purpose of the act is to ensure the safety of buildings for all who use them. This represents a step change in compliance and a culture change across the whole industry.

A common misconception is that it applies to just higher risk buildings, such as residential tower blocks. However, this legislation has significant implications for all buildings.

Competence Requirements

A key part of the legislation is 'competence requirements' for everyone involved in the building process. This means that everyone must have the 'skills, knowledge, experience and behaviours' necessary for their role and be able to demonstrate their competence.

For those involved with anchors this gives added importance to implementing and following BS 8539. In doing so they will develop important skills and knowledge for their role and a recognised way of demonstrating competence.

Golden Thread

This is the name given to the information that allows someone to understand a building and keep it safe, both now and in the future. This is a requirement for higher risk buildings but will inevitably extend more widely throughout the building sector.

In result this is leading to increased awareness of the need for reliable product data and information to document the installation. Using a tested support system with approved anchors provides valuable evidence for substantiating the safety of the installation.

MIDFIX APPROVED ANCHORS

BS 8539 states that approved anchors should be used whenever there is one available for the application.

This means the anchors have undergone rigorous testing and have a UK or European Technical Assessment (UKTA/ETA) and carry the UKCA or CE mark.

What are the benefits of using ‘Approved Anchors’?

- Comply with the recommendations of BS 8539 safeguarding the liabilities of the parties involved.
- All parties to the construction process can be confident in the long-term security of the fixings.
- Comprehensive load data is provided to evidence the installation.
- Site testing is not required for most applications.

Anchors in the MIDFIX Anchor System are of the highest quality and suitably approved for safety critical fixing applications.

MIDFIX ANCHOR TRAINING

The single biggest cause of anchor failure is installer error. BS 8539 addresses this by requiring installers and supervisors to be suitably trained and provided with the necessary instructions and tools to carry out the installation correctly. This is hugely important in reducing risk and eliminating bad practice in anchor installations.

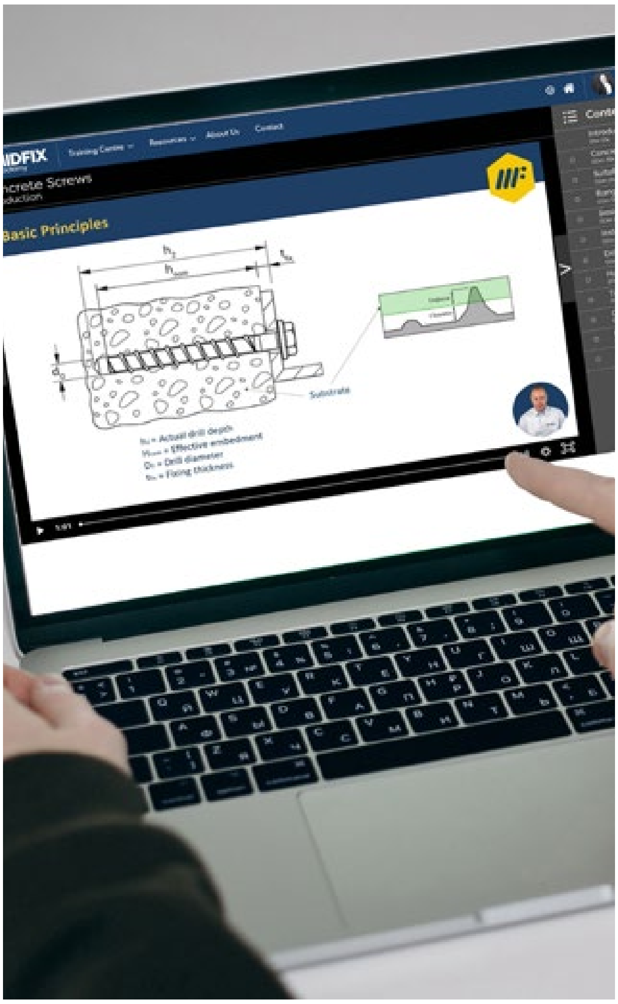
The difficulty this presents to the contractor is how to deliver the appropriate training across a large number of operatives and maintain records to prove the training has been delivered and the necessary competence achieved.

MIDFIX have addressed this difficulty by introducing the MIDFIX Academy to allow contractors to successfully embed anchor compliance at site level.

What is the ‘MIDIFX Academy’?

This is our online learning platform for upskilling the M&E sector. Through this platform installers can access the training they need to install anchors to the correct standards.

Training is delivered through a series of tutorial videos covering the theory of the different types of anchors and demonstrating the correct tools and installation methods to achieve a compliant installation. Trainees successfully completing the training and online assessment tests receive digital certification for a record of training.



MIDFIX ANCHOR TESTING

Anchor testing is the process where an anchor is tested to a designated test load so that its performance can be quantified. BS 8539 sets out the criteria for testing anchors.

One of the key benefits of using 'approved anchors', as stated in BS 8539, is that site testing is not required when the manufacturer provides load data for the relevant base material and the anchors are installed by competent persons working under supervision. In this case the anchors have already been tested more stringently than is possible at site level and further testing is not necessary.

When following BS 8539 site testing is usually only necessary when the exact nature of the base material is unknown such as in refurbishment projects.

BS 8539 covers two types of anchor testing:

Allowable Load Tests

An allowable load test is carried out where the application is not covered by a relevant UKTA or ETA or the strength and condition of the base material is unknown. Anchors are tested to failure to determine the loads they can safely hold.

Proof Tests

Proof tests are undertaken to check the quality of the installation. The installed anchors are tested to no more than 1.5 times the recommended load.

BS 8539 requires that anybody carrying out anchor testing should be qualified by the Construction Fixings Association (CFA).

MIDFIX technical representatives all hold the CFA Advanced Testing qualification to perform allowable load tests and proof tests to BS 8539 standards.

MCS-RH MIDFIX ROD HANGERS

Features

- Thread cutting anchors with dual M8/M10 internal thread
- For hanging building services from solid and hollow concrete ceilings
- High load capacity in cracked and uncracked concrete
- Two lengths – standard and short for reduced embedment
- Advantages – small drill diameter, non-expanding, fast installation

Testing & approvals

- European Technical Assessments ETA-15/0514 & ETA-16/0123
- Approved for use as a multiple fixing in cracked and uncracked concrete
- Approved for use as a multiple fixing in pre-stressed concrete floor slabs
- Approved for use as a single fixing in uncracked concrete
- Fire resistance tested in concrete

ETA-15/0514
For use in cracked and non-cracked concrete

ETA-16/0123
For multiple use in concrete for non-structural applications

R 30 - R 120

MCS-RH Rod Hangers

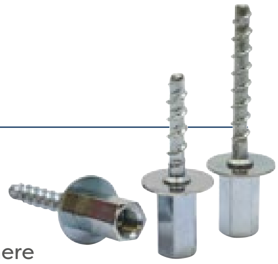
CODE	MF CODE	ANCHOR LENGTH	DRILL Ø x DEPTH	BOX QTY
MCS6x35RH	0293735	35	6 x 40	100
MCS6x55RH	0293755	55	6 x 60	100

Installation Tool

- Magnetic drive socket with ¼″ shank
- Suits cordless drills and impact drivers

CODE	MF CODE	SIZE	DRIVE	PACK QTY
MOP13	2394213	13	¼″ Hex	1

MCS-RH MIDFIX ROD HANGERS



TECHNICAL DATA

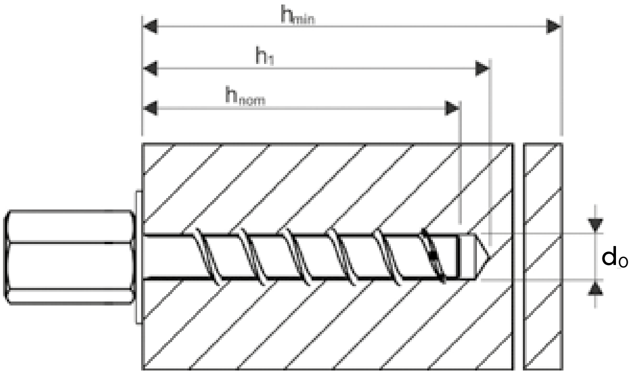
For cracked and non-cracked concrete

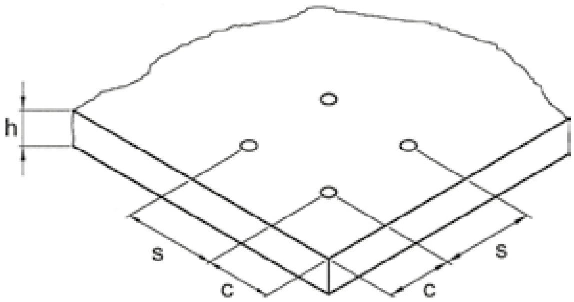
Extract from Permissible Service Conditions of European Technical Assessment ETA-16/0123
For anchors used in multiple for non-structural applications. Typical of building services installations where the load of the installation is shared between multiple fixings. Total safety factor as per ETAG 001 included. For anchor design, loads at reduced edge and spacing distances and loads under fire exposure the full ETA has to be considered.

ETA-16/0123
For multiple use in concrete for non-structural applications

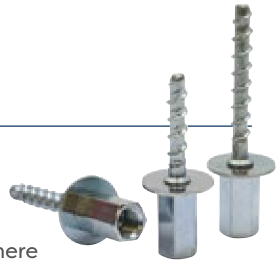
LOADS AND PERFORMANCE DATA (CONCRETE C20/25)			6×35	6×55
Cracked and non-cracked concrete				
Permissible tension load		[kN]	1.4	3.6
Spacing and edge distance				
Nominal embedment depth	h_{nom}	[mm]	35	55
Required spacing*	S	[mm]	81	132
Required edge distance*	C	[mm]	41	66
Minimum thickness of concrete	h_{min}	[mm]	80	100
Installation parameters				
Drill hole diameter	d_0	[mm]	6	6
Depth of drill hole	h_1	[mm]	40	60
Installation torque		[Nm]	10	10
Maximum torque (with impact screwdriver)		[Nm]	160	160

*For maximum loads





MCS-RH MIDFIX ROD HANGERS



TECHNICAL DATA

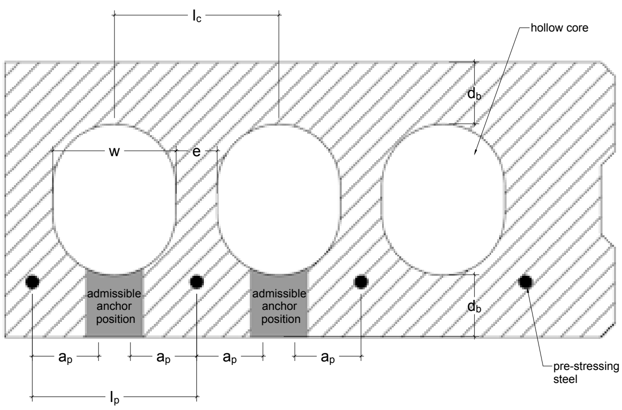
For precast pre-stressed hollow core slabs

Extract from Permissible Service Conditions of European Technical Assessment ETA-16/0123
For anchors used in multiple for non-structural applications. Typical of building services installations where the load of the installation is shared between multiple fixings. Total safety factor as per ETAG 001 included.
For full design information consult ETA-16/0123.

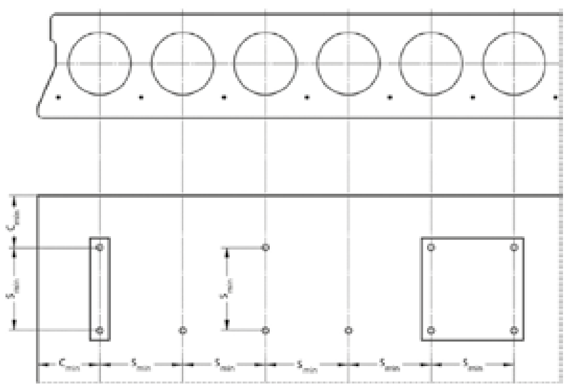
ETA-16/0123
For multiple use in concrete for non-structural applications

LOADS AND PERFORMANCE DATA			6×35		
Flange thickness	d_b	[mm]	min 25	min 30	min 35
Permissible tension load		[kN]	0.5	1.0	1.4
Spacing and edge distance					
Minimum spacing	S	[mm]		100	
Minimum edge distance	C	[mm]		100	
Minimum hollow core centres	l_c	[mm]		100	
Minimum reinforcement distance	l_p	[mm]		100	
Minimum distance between anchor & reinforcement	a_p	[mm]		50	
Maximum hollow core/bridge width ratio	w/e			< 4,2	
Installation parameters					
Drill hole diameter		[mm]		6	
Depth of drill hole		[mm]	30	35	40
Installation torque		[Nm]		10	
Maximum torque (with impact screwdriver)		[Nm]		160	

Admissible anchor positions



Minimum spacing and edge distance



MCS-HX MIDFIX CONCRETE SCREWS

Features

- Hexagon head thread cutting anchors
- European manufactured
- High load capacity in cracked and uncracked concrete
- Zinc flake coating for good corrosion resistance
- Fast installation using impact wrench
- Head markings for product identification
- ETA approval on all sizes including short embedment versions

Testing & approvals

- European Technical Assessments ETA-15/0514 & ETA-16/0123
- Approved for use in cracked and uncracked concrete
- 6 x 40mm version approved for use as a multiple fixing in pre-stressed concrete floor slabs
- Fire resistance approval

ETA-15/0514 For use in cracked and non-cracked concrete

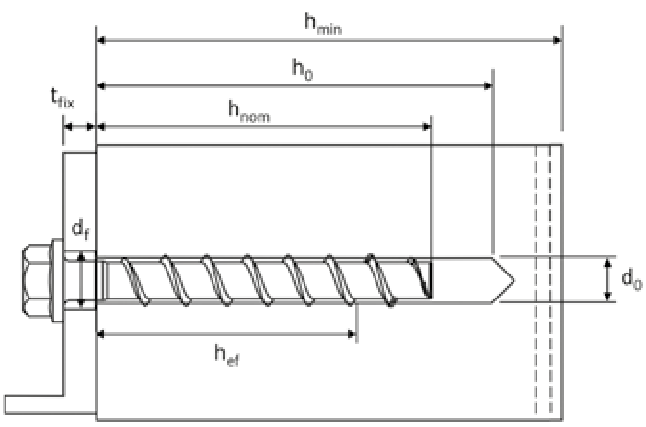
ETA-16/0123 For multiple use in concrete for non-structural applications

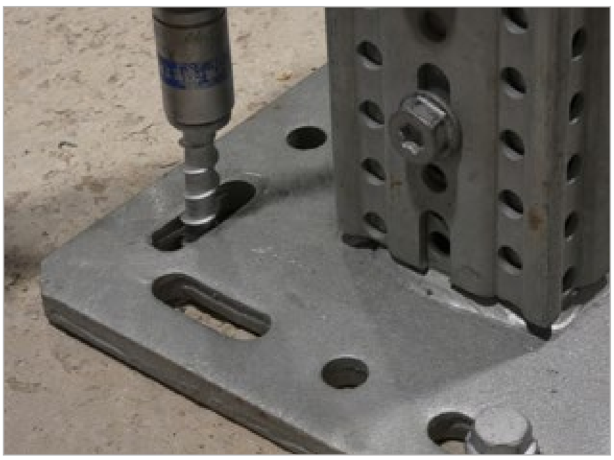
R 30 - R 120

CODE	MF CODE	DRILL Ø	DRIVE	HEAD Ø	BOX QTY
MCS6x40HX	02938220	6	HEX 13	15	100
MCS8x50HX	02938325	8	HEX 13	16	50
MCS8x70HX	02938335	8	HEX 13	16	50
MCS10x60HX	02938430	10	HEX 15	20	50
MCS10x80HX	02938440	10	HEX 15	20	50

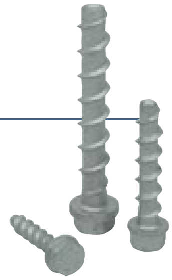
Fixing Thickness and Embedment Options

CODE	FIXING THICKNESS			EMBEDMENT DEPTH OF ANCHOR			DRILL DEPTH		
	t_{fix1}	t_{fix2}	t_{fix3}	h_{nom1}	h_{nom2}	h_{nom3}	h_1	h_2	h_3
MCS6x40HX	5	-	-	35	-	-	40	-	-
MCS8x50HX	5	-	-	45	-	-	55	-	-
MCS8x70HX	25	15	5	45	55	65	55	65	75
MCS10x60HX	5	-	-	55	-	-	65	-	-
MCS10x80HX	25	5	-	55	75	-	65	85	-





MCS-HX MIDFIX CONCRETE SCREWS



TECHNICAL DATA

For cracked and non-cracked concrete

MCS8 & MCS10 - Maximum permissible loads according to ETA-15/0514 for single anchors without spacing or edge distance considerations.
MCS6 - Maximum permissible loads according to ETA-16/0123. Only approved for multiple use for non-structural applications. Typical of building services installations where the load is shared between multiple fixings.

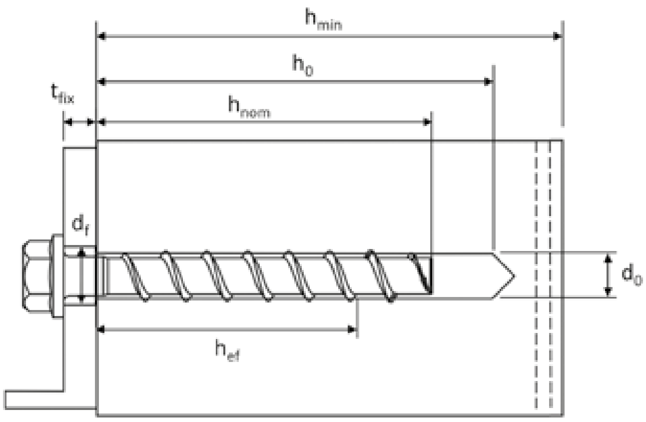
For anchor design, loads at reduced edge and spacing distances and loads under fire exposure the full ETA must be considered.

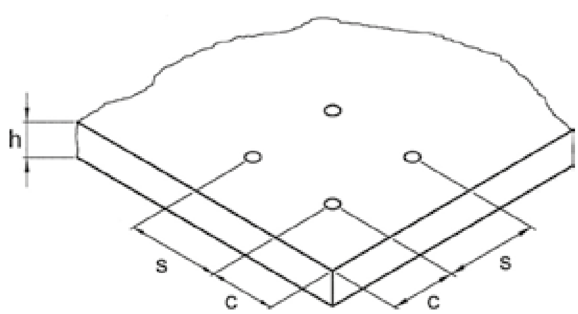
ETA-15/0514
For use in cracked and non-cracked concrete

ETA-16/0123
For multiple use in concrete for non-structural applications

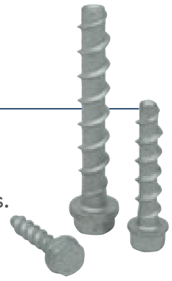
LOADS AND PERFORMANCE DATA (CONCRETE C20/25)			MCS6	MCS8			MCS10	
Embedment Depth	h_{nom}		h_{nom1}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}
		[mm]	35	45	55	65	55	75
Permissible tension load in Cracked Concrete		[kN]	1.4	2.4	4.3	5.7	4.3	7.6
Permissible shear load in Cracked Concrete		[kN]	2.4	3.5	4.6	6.1	4.6	15.2
Permissible tension load in Non-cracked Concrete		[kN]	1.4	3.6	5.7	7.6	5.7	9.5
Permissible shear load in Non-cracked Concrete		[kN]	3.4	5.0	6.6	8.8	6.6	19.4
Spacing and edge distance								
Required spacing*	S	[mm]	81	105	129	156	129	180
Required edge distance*	C	[mm]	41	53	65	78	65	90
Minimum thickness of concrete	h_{min}	[mm]	80	100	100	120	100	130
Installation parameters								
Drill hole diameter	d_o	[mm]	6		8		10	
Depth of drill hole	h_o	[mm]	40	55	65	75	65	85
Installation torque		[Nm]	10		20		40	
Maximum torque (with impact screwdriver)		[Nm]	160		300		400	

*For maximum loads





MCS-HX MIDFIX CONCRETE SCREWS



TECHNICAL DATA

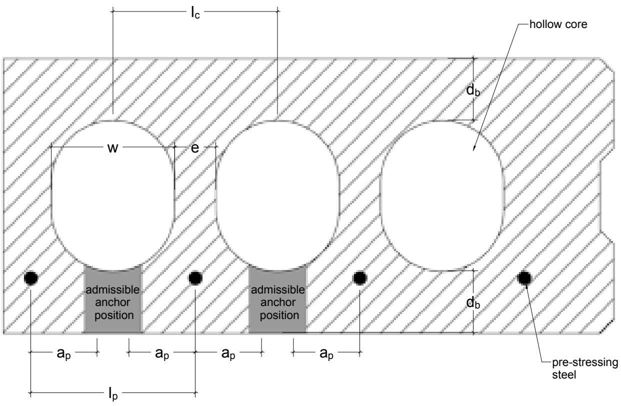
For precast pre-stressed hollow core slabs

Maximum permissible loads according to ETA-16/0123 for anchors used in multiple for non-structural applications. Typical of building services installations where the load of the installation is shared between multiple fixings.

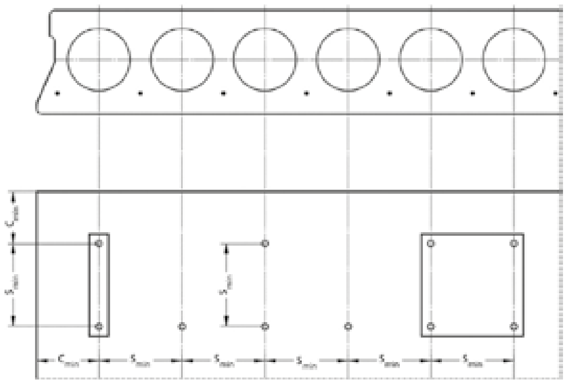
ETA-16/0123
For multiple use in concrete for non-structural applications

LOADS AND PERFORMANCE DATA			MCS6×40HX		
Maximum fixing thickness		[MM]		5.0	
Flange thickness	d_b	[mm]	min 25	min 30	min 35
Permissible tension load		[kN]	0.5	1.0	1.4
Spacing and edge distance					
Minimum spacing	S	[mm]		100	
Minimum edge distance	C	[mm]		100	
Minimum hollow core centres	l_c	[mm]		100	
Minimum reinforcement centres	l_p	[mm]		100	
Minimum distance between anchor & reinforcement	a_p	[mm]		50	
Maximum Hollow core/bridge width ratio	w/e			< 4,2	
Installation parameters					
Drill hole diameter		[mm]		6	
Depth of drill hole		[mm]		40	
Installation torque		[Nm]		10	
Maximum torque (with impact screwdriver)		[Nm]		160	

Admissible anchor positions



Minimum spacing and edge distance



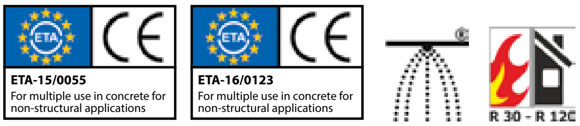
MCS-LP MIDFIX CONCRETE SCREWS

Features

- Thread cutting anchors for cracked and uncracked concrete
- 17mm large pan head with torx drive – ideal for fixing slotted channel
- Two lengths - 28mm shallow embedment version for low risk of reinforcement hits
- Small drill diameter and fast installation

Testing & approvals

- European Technical Assessments ETA-15/0055 & ETA-16/0123
- Approved for use as a multiple fixing in cracked and uncracked concrete
- 40mm version approved for use as a multiple fixing in pre-stressed concrete floor slabs
- Fire resistance tested in concrete



MCS-LP Concrete Screws

CODE	MF CODE	MAX THICKNESS	DRILL Ø	DRIVE	BOX QTY
MCS6x28LP	0293928	3	6	TX 30	100
MCS6x40LP	0293940	5	6	TX 30	100

MCS-LP MIDFIX CONCRETE SCREWS

TECHNICAL DATA

For cracked and non-cracked concrete

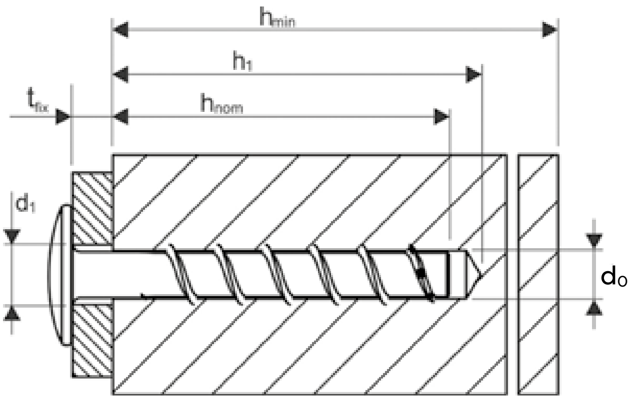
Extract from Permissible Service Conditions of European Technical Assessments ETA-15/0055 & ETA-16/0123
For anchors used in multiple for non-structural applications. Typical of building services installations where the load of the installation is shared between multiple fixings. Total safety factor as per ETAG 001 included. For anchor design, loads at reduced edge and spacing distances and loads under fire exposure the full ETA has to be considered.

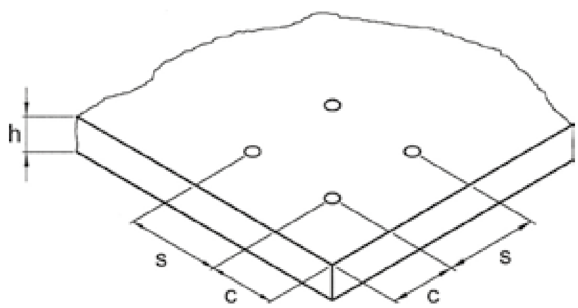
ETA-15/0055 For multiple use in concrete for non-structural applications

ETA-16/0123 For multiple use in concrete for non-structural applications

LOADS AND PERFORMANCE DATA (CONCRETE C20/25)			**6×28**	**6×40**
Cracked and non-cracked concrete				
Permissible tension load		[kN]	0.43	1.4
Spacing and edge distance				
Nominal embedment depth	h_{nom}	[mm]	25	35
Required spacing*	S	[mm]	57	81
Required edge distance*	C	[mm]	29	41
Minimum thickness of concrete	h_{min}	[mm]	80	80
Installation parameters				
Drill hole diameter	d_o	[mm]	6	6
Depth of drill hole	h_1	[mm]	28	40
Installation torque		[Nm]	10	10
Maximum torque (with impact screwdriver)		[Nm]	**	160

*For maximum loads ** Impact screwdriver should not be used





MCS-LP MIDFIX CONCRETE SCREWS

TECHNICAL DATA

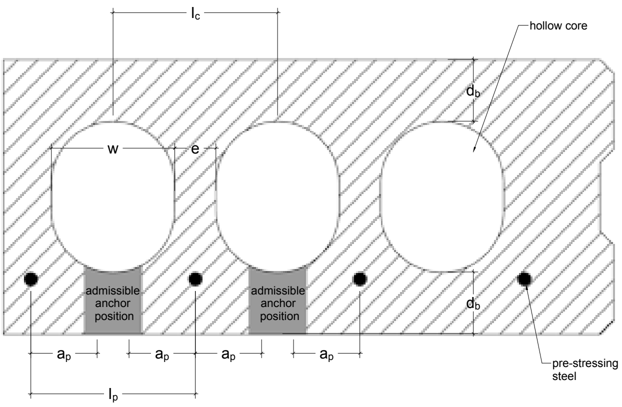
For precast pre-stressed hollow core slabs

Extract from Permissible Service Conditions of European Technical Assessment ETA-16/0123
For anchors used in multiple for non-structural applications. Typical of building services installations where the load of the installation is shared between multiple fixings. Total safety factor as per ETAG 001 included. For full design information and loads under fire exposure consult ETA-16/0123.

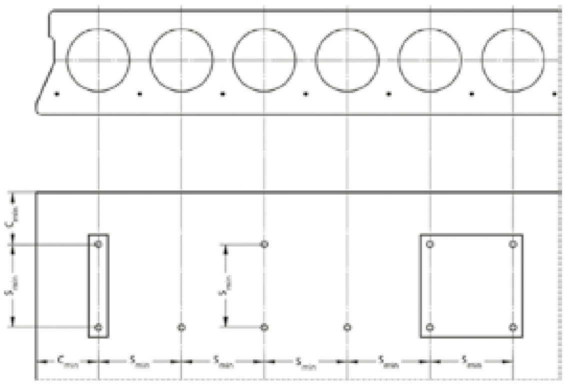
ETA-16/0123
For multiple use in concrete for non-structural applications

LOADS AND PERFORMANCE DATA			6×40		
Flange thickness	d_b	[mm]	min 25	min 30	min 35
Permissible tension load		[kN]	0.5	1.0	1.4
Spacing and edge distance					
Minimum spacing	S	[mm]	100		
Minimum edge distance	C	[mm]	100		
Minimum hollow core centres	l_c	[mm]	100		
Minimum reinforcement centres	l_p	[mm]	100		
Minimum distance between anchor & reinforcement	a_p	[mm]	50		
Maximum Hollow core/bridge width ratio	w/e		< 4,2		
Installation parameters					
Drill hole diameter		[mm]	6		
Depth of drill hole		[mm]	40		
Installation torque		[Nm]	10		
Maximum torque (with impact screwdriver)		[Nm]	160		

Admissible anchor positions



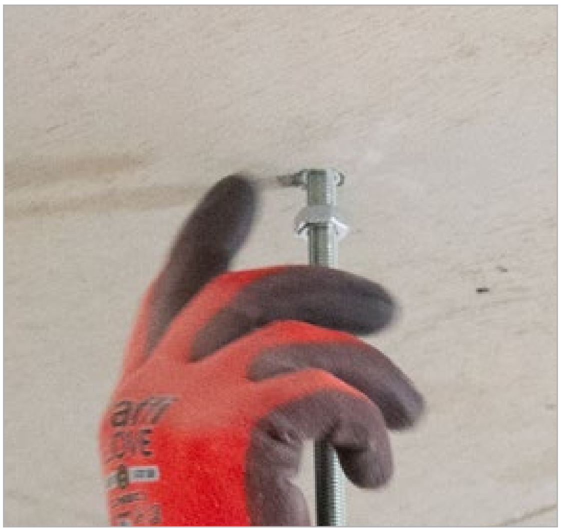
Minimum spacing and edge distance



MWA MIDFIX WEDGE ANCHORS

Features

- High performance internally threaded anchors for concrete
- 25mm shallow embedment versions for low risk of reinforcement hits
- Rimmed design for flush setting
- Reliably set by means of manual or SDS setting tools
- Brilliant SDS stop-drill bit with plug-on setting tool for quick and effortless, high volume installations



Testing & approvals

- European Technical Assessments ETA-02/0020 & ETA-05/0116
- Approved for use as a multiple fixing in cracked and uncracked concrete
- Approved for use as a multiple fixing in pre-stressed concrete floor slabs
- Approved for use as a single fixing in uncracked concrete
- Fire resistance tested in concrete

ETA-02/0020
For use in non-cracked concrete

ETA-05/0116
For multiple use in concrete for non-structural applications

R30-R120

FM approved

MWA Wedge Anchors

CODE	MF CODE	DRILL Ø x DEPTH	THREAD Ø x LENGTH	BOX QTY
MWA6x25	02120625	8 x 25	M6 x 12	100
MWA8x25	02120825	10 x 25	M8 x 12	100
MWA8x30	02120830	10 x 30	M8 x 13	100
MWA10x25	02121025	12 x 25	M10 x 12	100
MWA10x30	02121030	12 x 30	M10 x 12	100
MWA12x25	02121225	15 x 25	M12 x 12	100
MWA12x50	02121250	15 x 50	M12 x 18	100

MBB SDS Stop-Drill Bits

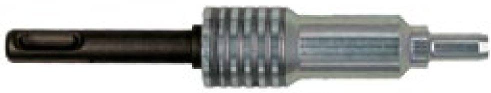
- Facilitate repetitive drilling to correct hole depth
- Reduced risk of reinforcement hits

CODE	MF CODE	SUITS WEDGE ANCHORS	SUITS PLUG-ON SETTING KIT	PACK QTY
MBB10x25	0216310	MWA8x25	MSK8x25	1
MBB10x30	0216320	MWA8x30	MSK8x30	1
MBB12x25	0216312	MWA10x25	MSK10x25	1
MBB12x30	0216322	MWA10x30	MSK10x30	1
MBB15x25	0216315	MWA12x25		1

MWA MIDFIX WEDGE ANCHORS

MSK Plug-on Setting Kit

- Comprises of MBB SDS stop-drill with plug-on setting tool for drilling and setting in one easy and effortless operation
- Use just one drilling machine to drill and set the anchors without changing over – drill, plug-on and set.
- Specially recommended for repetitive overhead installations
- Just replace MBB Stop-drills when worn

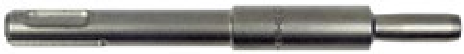


CODE	MF CODE	SUITS WEDGE ANCHOR	PACK QTY
MSK8X25	02160825	MWA8x25	1
MSK8X30	02160830	MWA8x30	1
MSK10X25	02161025	MWA10x25	1
MSK10X30	02161030	MWA10x30	1

MSD SDS Setting Tool

- Standard SDS tools for hammer drill setting

CODE	MF CODE	SUITS WEDGE ANCHOR	PACK QTY
MSD8x25	0216385	MWA8x25	1
MSD8x30	0216390	MWA8x30	1
MSD10x25	0216415	MWA10x25	1
MSD10x30	0216420	MWA10x30	1
MSD12x25	0216525	MWA12x25	1
MSD12x50	0216550	MWA12x50	1



MSS Safety Setting Tool

- Manual setting tool with safety handle

CODE	MF CODE	SUITS WEDGE ANCHOR	PACK QTY
MSS6x25	0216706	MWA6x25	1
MSS8x25	0216708	MWA8x25	1
MSS8x30	0216718	MWA 8x30	1
MSS10x25	0216710	MWA10x25	1
MSS10x30	0216720	MWA10x30	1
MSS12x25	0216712	MWA12x25	1
MSS12x50	0216732	MWA 12x50	1

MWA MIDFIX WEDGE ANCHORS

TECHNICAL DATA

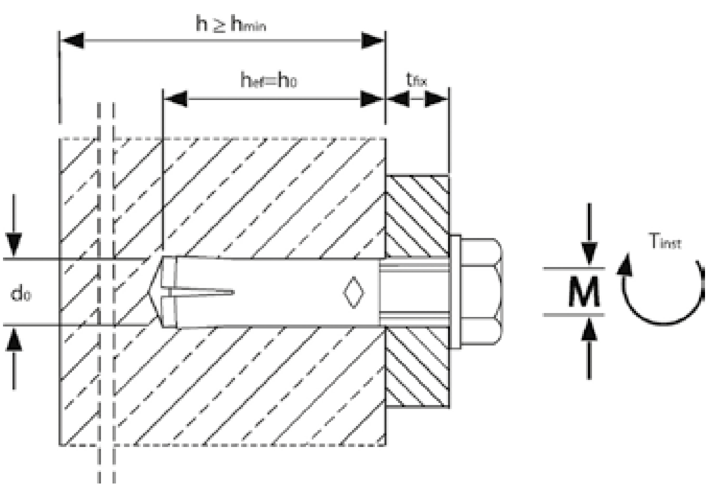
For cracked and non-cracked concrete

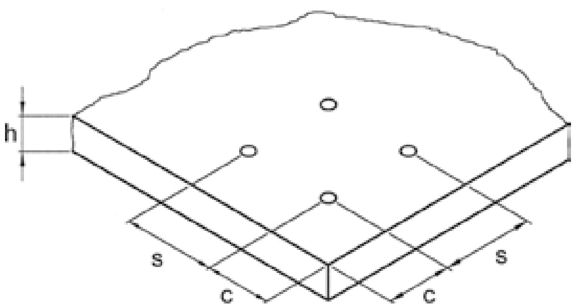
Extract from Permissible Service Conditions of European Technical Assessment ETA-05/0116
For anchors used in multiple for non-structural applications. Typical of building services installations where the load of the installation is shared between multiple fixings. Total safety factor as per ETAG 001 included. For anchor design, loads at reduced edge and spacing distances and loads under fire exposure the full ETA has to be considered.

ETA-05/0116
For multiple use in concrete for non-structural applications

LOADS AND PERFORMANCE DATA			M6×25	M8×25	M8×30	M10×25	M10×30	M12×25	M12×50
			Cracked and non-cracked concrete (C20/25 to C50/60)						
Permissible tension load		[kN]	1.7	1.9	1.7	2.1	2.0	2.1	2.4
Spacing and edge distance									
Effective anchorage depth	h_{ef}	[mm]	25	25	30	25	30	25	50
Required spacing*	S	[mm]	75	75	180	75	230	75	170
Required edge distance*	C	[mm]	38	38	90	38	115	38	85
Minimum thickness of concrete	h_{min}	[mm]	100	100	100	100	120	100	130
Installation parameters									
Drill hole diameter	d_o	[mm]	8	10	10	12	12	15	15
Diameter of clearance hole in the fixture	d_r	[mm]	7	9	9	12	12	14	14
Depth of drill hole	h_0	[mm]	25	25	30	25	30	25	50
Maximum installation torque	$T_{inst} \leq$	[Nm]	4	8	8	15	15	35	35
Minimum screwing depth		[mm]	6	8	9	10	10	12	13
Maximum screwing depth		[mm]	12	12	13	12	12	12	18

*For maximum loads





MWA MIDFIX WEDGE ANCHORS

TECHNICAL DATA

For precast pre-stressed hollow core slabs

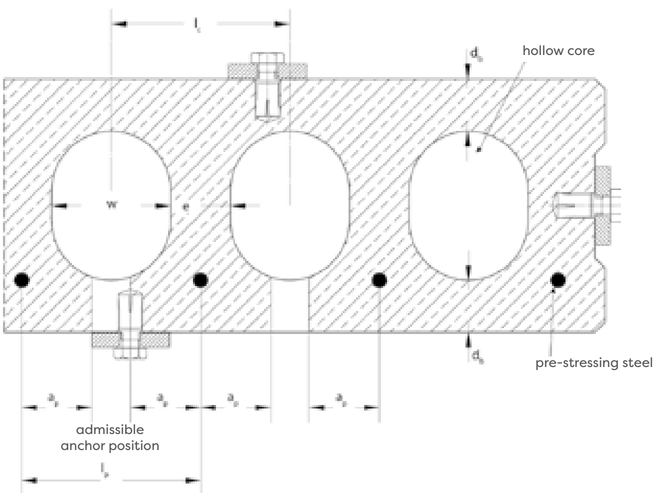
Extract from Permissible Service Conditions of European Technical Assessment ETA-05/0116
For anchors used in multiple for non-structural applications. Typical of building services installations where the load of the installation is shared between multiple fixings. Total safety factor as per ETAG 001 included. For full design information consult ETA-05/116.

ETA-05/0116
For multiple use in concrete for non-structural applications

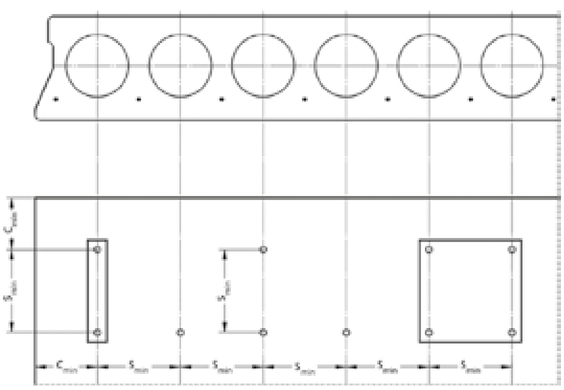
LOADS AND PERFORMANCE DATA			M6×25	M8×25	M10×25	M12×25
Flange thickness	d_b	[mm]	35*			
Permissible tension load		[kN]	1.7	1.9	2.1	2.1
Spacing and edge distance						
Minimum spacing	S	[mm]	200			
Minimum edge distance	C	[mm]	150			
Minimum hollow core centres	l_c	[mm]	100			
Minimum reinforcement centres	l_p	[mm]	100			
Minimum distance between anchor & reinforcement	a_p	[mm]	50			
Maximum hollow core/bridge width ratio	w/e		2			
Installation parameters						
Drill hole diameter	d_o	[mm]	8	10	12	15
Diameter of clearance hole in the fixture	dr	[mm]	7	9	12	14
Depth of drill hole*	ho	[mm]	25	25	25	25
Maximum installation torque	$T_{inst} \leq$	[Nm]	4	8	15	35
Minimum screwing depth		[mm]	6	8	10	12
Maximum screwing depth		[mm]	12	12	12	12

*Drill hole must not enter hollow core

Admissible anchor positions



Minimum spacing and edge distance



R-HPT THROUGHBOLTS – ZINC FLAKE

Features

- High performance throughbolt for safety critical applications
- Suitable for overhead fixings into cracked concrete
- Zinc flake coating for extra corrosion resistance
- Through fixing for easy installation

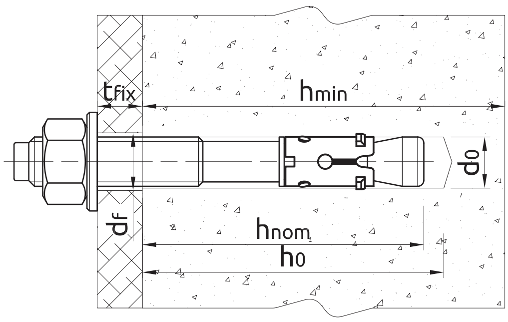
Testing & approvals

- European Technical Assessment ETA-17/0184
- Approved for structural use in cracked and non-cracked concrete
- Fire resistance tested up to 120 minutes

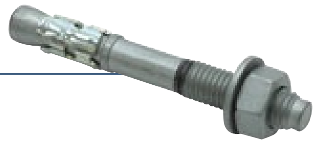
ETA-17/0184
For use in cracked and non-cracked concrete

R 30 - R 120

SIZE	MF CODE	FIXING THICKNESS t_{fix1}	FIXING THICKNESS t_{fix2}	DRILL Ø	BOX QTY
M8 X 65	02442332	15	-	8	100
M10 X 65	02442432	5	-	10	50
M10 X 80	02442440	20	-	10	50
M10 X 95	02442447	35	15	10	50
M10 X 115	02442452	55	35	10	50
M12 X 80	02442540	5	-	12	50
M12 X 100	02442550	25	5	12	50
M12 X 120	02442554	45	25	12	50
M16 X 140	02442658	40	20	16	25



R-HPT THROUGHBOLTS – ZINC FLAKE



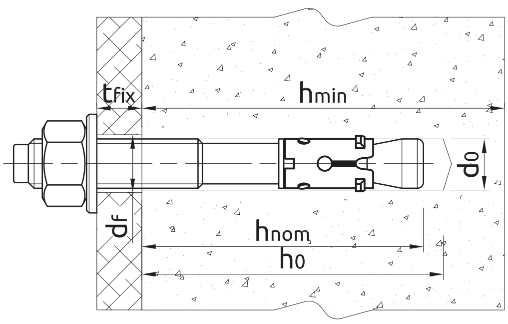
TECHNICAL DATA
For cracked and non-cracked concrete

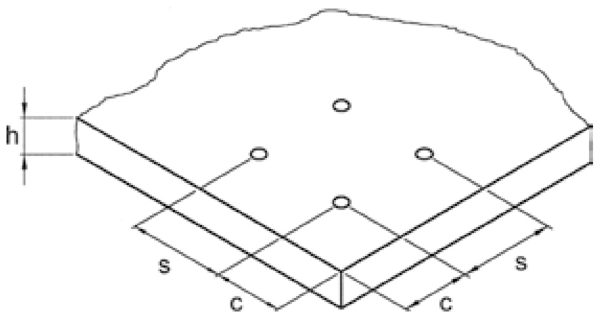
Maximum allowable loads for single anchor in C20/25 concrete without spacing or edge distance considerations. For anchor design, loads at reduced edge and spacing distances and loads under fire exposure the full ETA has to be considered.

ETA-17/0184
For use in cracked and non-cracked concrete

LOADS AND PERFORMANCE DATA (CONCRETE C20/25)			M8		M10		M12		M16	
Embedment Depth	h_{nom}		t_{fix1}	t_{fix2}	t_{fix1}	t_{fix2}	t_{fix1}	t_{fix2}	t_{fix1}	t_{fix2}
		[mm]	40	55	49	69	60	80	80	100
Permissible tension load in Cracked Concrete		[kN]	1.2	2.0	2.4	4.3	4.3	5.7	7.6	9.5
Permissible shear load in Cracked Concrete		[kN]	3.0	5.2	4.0	7.4	5.5	13.5	17.2	25.7
Permissible tension load in Non-cracked Concrete		[kN]	3.0	3.6	3.6	5.7	5.7	9.5	12.3	16.6
Permissible shear load in Non-cracked Concrete		[kN]	4.2	5.2	5.7	9.0	7.8	13.5	24.6	26.9
Spacing and edge distance										
Minimum spacing*	S	[mm]	55	50	75	70	150	90	190	160
Minimum edge distance*	C	[mm]	45	40	60	50	80	65	110	90
Minimum thickness of concrete	h	[mm]	100	100	100	120	100	140	130	170
Installation parameters										
Drill hole diameter	d_o	[mm]	8		10		12		16	
Depth of drill hole	h_o	[mm]	50	65	59	79	70	90	90	110
Installation torque		[Nm]	10		20		40		100	

*For maximum loads





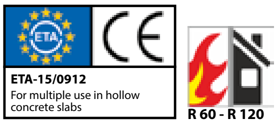
HCA HOLLOW CONCRETE ANCHORS

Features

- High load performance anchors for hollow concrete ceiling slabs
- High expansion capacity
- Female thread for accepting bolts and threaded rod
- Ideal for building services installations

Testing & approvals

- European Technical Assessment ETA-15/0912
- Approved for use as a multiple fixing in pre-stressed concrete floor slabs
- Fire resistance tested



HCA Hollow Concrete Anchors

CODE	MF CODE	ANCHOR LENGTH	DRILL Ø	BOX QTY
HCA M8	0211308	44	12	50
HCA M10	0211310	53	16	25

HCA HOLLOW CONCRETE ANCHORS

TECHNICAL DATA

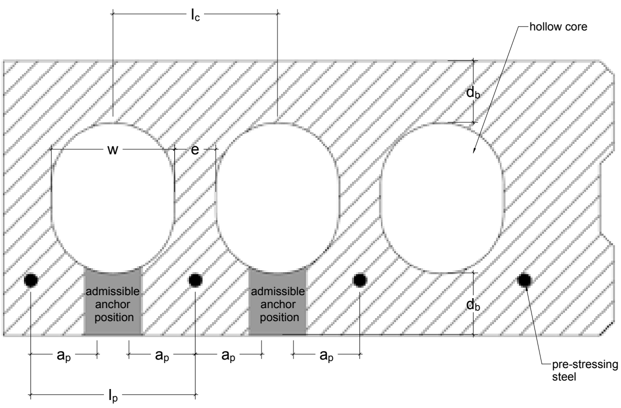
For precast pre-stressed hollow core slabs

Extract from European Technical Assessment ETA-15/0912
For anchors used in multiple for non-structural applications. Typical of building services installations where the load of the installation is shared between multiple fixings. Total safety factor as per ETAG 001 included. For full design information consult ETA-15/0912.

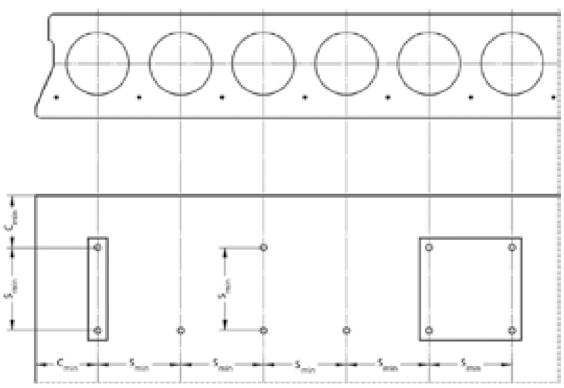
ETA-15/0912
For multiple use in hollow concrete slabs

LOADS AND PERFORMANCE DATA			HCA M8	HCA M10
Permissible tension load	d_b - min 25mm	[kN]	1.98	3.17
	d_b - min 30mm	[kN]	3.96	3.96
	d_b - min 40mm	[kN]	4.56	5.55
Spacing and edge distance				
Minimum spacing	S	[mm]	200	200
Minimum edge distance	C	[mm]	100	100
Minimum hollow core centres	l_c	[mm]	100	100
Minimum reinforcement centres	l_p	[mm]	100	100
Minimum distance between anchor & reinforcement	a_p	[mm]	50	50
Maximum Hollow core/bridge width ratio	w/e		2	2
Installation parameters				
Drill hole diameter ≥		[mm]	12	16
Depth of drill hole		[mm]	50	60
Installation torque		[Nm]	20	30
Minimum class of bolt		[Nm]	6.8	

Admissible anchor positions



Minimum spacing and edge distance



MX User Guide

CONTENTS

MX INSTALLATION PROCEDURES

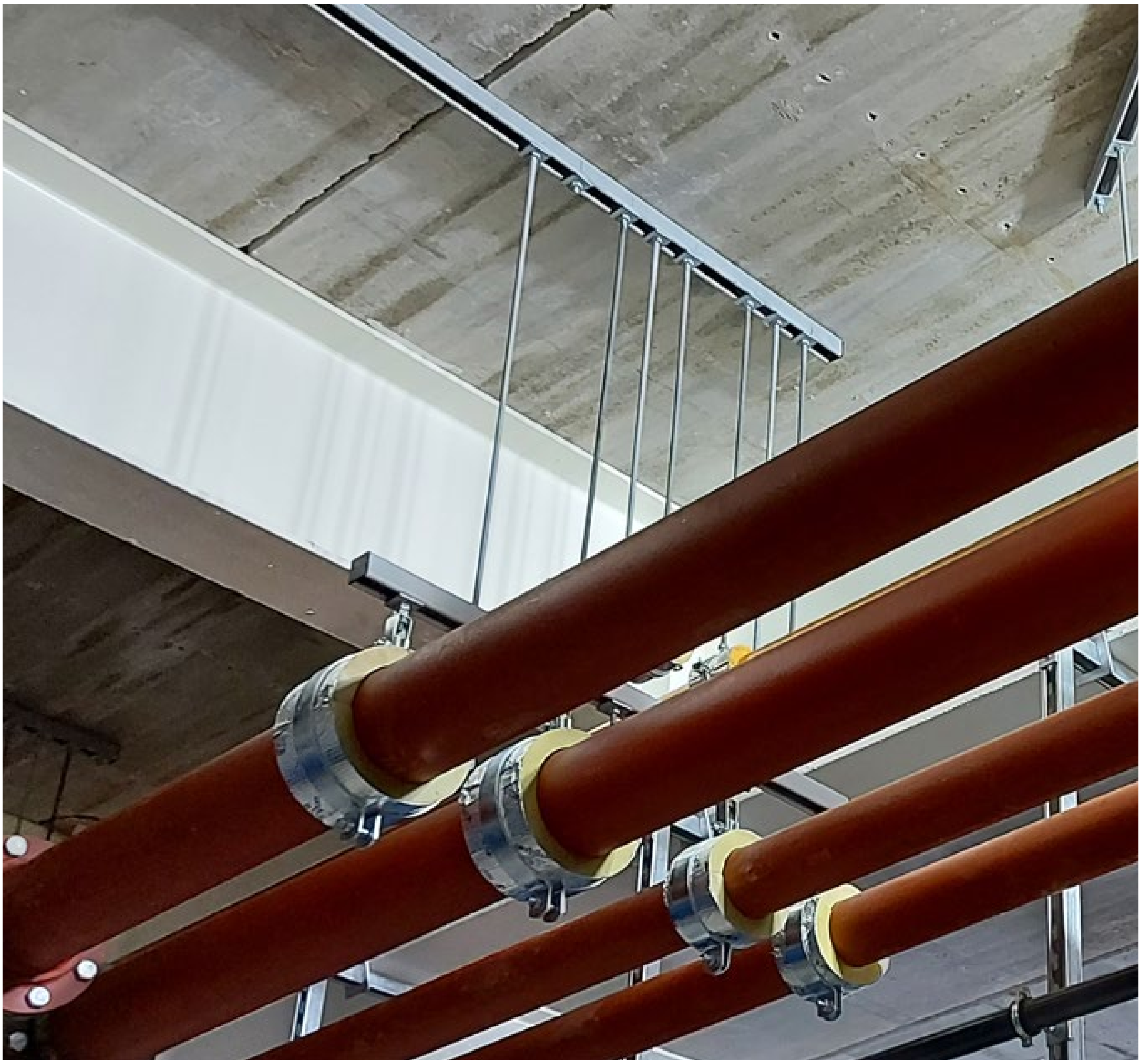
THE IMPORTANCE OF CORRECT INSTALLATION

These instructions describe the correct methods and procedures to be followed by installers of the MX channel system and correspond with the installer training programme available to installers through the MIDFIX Academy website.

To understand the importance of installer training we need to consider that building services supports are very often carrying significant loads of pipework and electrical services in overhead applications and are very clearly 'safety critical'. Failure of just one support can lead to a 'domino effect' and the collapse of a whole service run, posing a significant risk to the safety of the occupants and extensive damage to the building.

Often the largest variation with the supports is due to differences in the installation methods. To ensure the supports are fit for purpose and able to carry the required loads it is important for installers to understand the basic principles of a support system and how to install the supports or brackety correctly.

Following these 'best practice' installation methods is not difficult or time consuming and brings valuable benefits of standardisation and consistency across the installation.



PRIMARY CONSIDERATIONS

Understanding Products

It is common for supports to be made by combining products of unproven performance from a variety of sources into the installation. This leads to the unsatisfactory situation where it is impossible to prove that the supports and fixings are fit for purpose and can safely carry the loads being applied to them.

The MX channel system has comprehensive and dependable load data to evidence the suitability of the supports. MX channel and brackets are tested as a system meaning the load data and guarantees are only valid when genuine MX products are used. These can be identified by the MIDFIX or MX name stamped on all genuine system components.

Fasteners

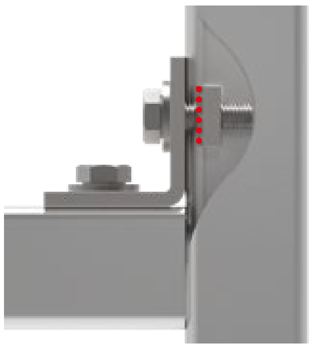
Set screws, nuts and washers used with the MX channel system are standard industry parts and any manufacturer's products to the relevant standards and grades can be used. To achieve the design loads it is important to use the fastener sizes specified in the MX Technical book. A summary of these can be found in the tables on pages 131-132.

- Set Screws – DIN 933 Grade 8.8
- Nuts – DIN 934 – Class 8
- Washers – DIN 125

Torque Values

Channel connections use frictional forces between the channel, brackets, and channel nuts to bear the slip load applied to the connection. This is assisted by the knurling on the in-turned lips of the channel and serrations in the grooves of the channel nuts. Frictional force is developed in the connection by the tension that is produced as the bolts are tightened. Correct torque settings are very important to ensure the optimum load is achieved. Too little torque will prevent the connection achieving its full load capacity. Over-tightening can damage or deform the components and likewise reduces the load in the connection.

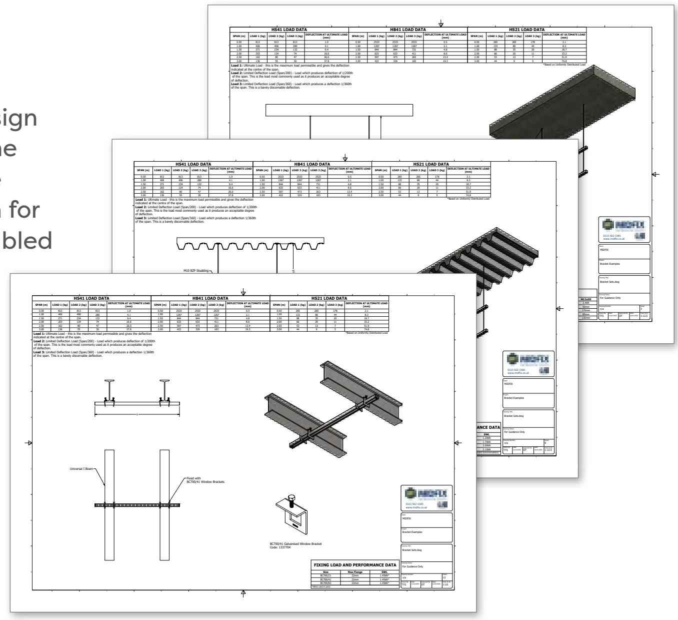
To achieve the design load of an MX bracket connection, use a calibrated torque wrench set to the specified torque value to ensure the fasteners are correctly and evenly tightened. A summary of torque values can be found in the tables on pages 131-132



PRIMARY CONSIDERATIONS CONT.

Design

It is becoming increasingly common there will be a design requirement for even basic supports. This is because the design gives important evidence that the supports are adequate for the loads they are carrying. It is common for supports and bracketry designed this way to be assembled off-site. When manufacturing on site it is equally important to make sure the supports are built to the design and are installed at the centres specified.



CHANNEL SECTIONS

Quality

MX channel is manufactured to BS 6946: 1988 and stamped with the British Standard and the MIDFIX name.

Profiles

MX channel is available in all the standard 41mm wide channel profiles and in 2.5mm and 1.5mm thicknesses.

Lengths

MX channel is available in 30 different lengths as standard as well as the regular 3m and 6m lengths.

CHANNEL SECTIONS CONT.

Finishes

MX channel comes in two finishes: pre-galvanised and hot dip galvanised.

Pre-galvanised

MX pre-galvanised channel is made from steel that is pre-coated with approximately 20 microns of zinc. This finish is recognised by its smooth, even appearance. Pre-galvanised channel is the standard product for all normal indoor environments and some low corrosion outdoor environments. The ends and edges are uncoated but receive a degree of corrosion protection from the proximity of the zinc coated surfaces, known as cathodic corrosion protection.

Hot dip galvanised

MX hot dip galvanised channel is galvanised after manufacture. This has a thicker zinc coating of at least 55 microns and all the edges are coated. Hot dip galvanised channel gives good corrosion protection in indoor and outdoor environments up to C4 corrosion classification. When this finish is specified it is important not to confuse the two products on site. Pre-galvanised channel has a smooth and shiny finish compared to the matt and less even appearance of hot dip galvanised.

Cutting Channel

It is increasingly common for channel to be pre-cut offsite and delivered ready to install. Pre-cut lengths are either manufactured to the finished size or cut in a fabrication shop. This is a much more efficient process than cutting on site, especially where large quantities of a size are required. Using pre-cut channel wherever possible reduces time and labour, wastage and the risks associated with cutting and handling long lengths on site.

Where it is necessary to cut channel on site the preferred cutting tools for this are:

1. Metal cutting chopsaws – these have TCT blades and are more accurate, safer, and produce less heat than abrasive chopsaws.
2. Cordless metal cutting saws - these are useful for cutting channel in confined spaces.

For any cutting operation it is important that all the necessary PPE is used for eye, hearing, and hand protection.

Chopsaws should be positioned at a safe working height on a suitable workbench with the channel properly supported on each side of the saw. Working at floor level should be avoided as it gives less control over the cutting operation and increases operator fatigue. A cutting station is the preferred choice because it confines sparks and reduces noise generated by the cutting operation. A cutting station will usually provide a good source of light for better visibility. Channel must be securely clamped in the chopsaw vice and a *maximum of two interlocked lengths cut at a time.*

CHANNEL SECTIONS CONT.

Dressing

After cutting, any sharp burrs should be removed from the ends of the channel. This can be done by hand using a file or with a wire wheel brush in a cordless drill.

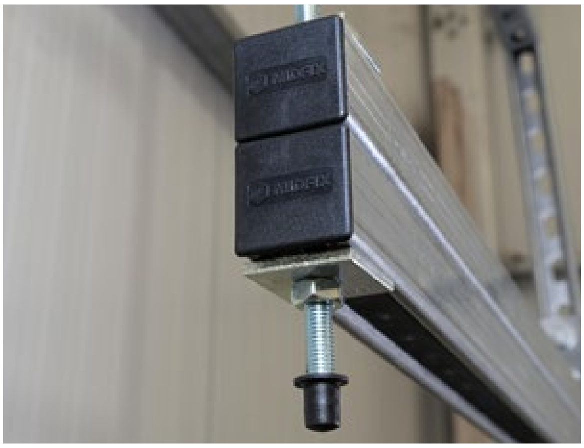
Painting Ends

With pre-galvanised channel the ends and edges are uncoated, and these get a measure of cathodic corrosion protection from the proximity of the zinc coated surfaces. For normal use it is not necessary to paint the cut ends of pre-galvanised channel.

Hot dip galvanised channel is typically used for external applications and where enhanced corrosion protection is required. It is galvanised after manufacture meaning all the edges are coated with zinc. When cutting HDG channel it is important to protect the ends of the channel with a suitable zinc-rich paint. This can be applied by brush or more often with an aerosol paint. When selecting paint, it is important to be aware that the corrosion protection is proportional to the zinc content of the paint, and this can vary considerably between products.

End Caps

Channel end caps and stud protection caps should always be fitted as standard good practice. Primarily they help reduce injury from the ends of channel and threaded rod especially during installation. Additionally, these low-cost parts make an important aesthetic contribution to the quality of the project



CHANNEL TO CHANNEL BRACKET CONNECTIONS

Channel nuts are a key component in the performance of a bracket connection.
How they work is often not understood and it is critical they are correctly installed.

Installation

Channel Nuts with Springs: The function of the spring is to retain the channel nut in position during installation

1. Insert the channel nut anywhere along the length of the channel.
2. Turn the nut 90° clockwise to align the grooves in the nut with the lips of the channel
3. Position the bracket in the desired position on the channel. Insert the specified set screw with a washer and hand tighten.

Channel Nuts without Springs

1. Pre-assemble the brackets with the specified set screws, washers and channel nuts with the grooves facing upwards.
2. Position the bracket in the desired position on the channel.
3. Turn the set screws by hand to rotate the channel nuts through 90° and hand tighten.

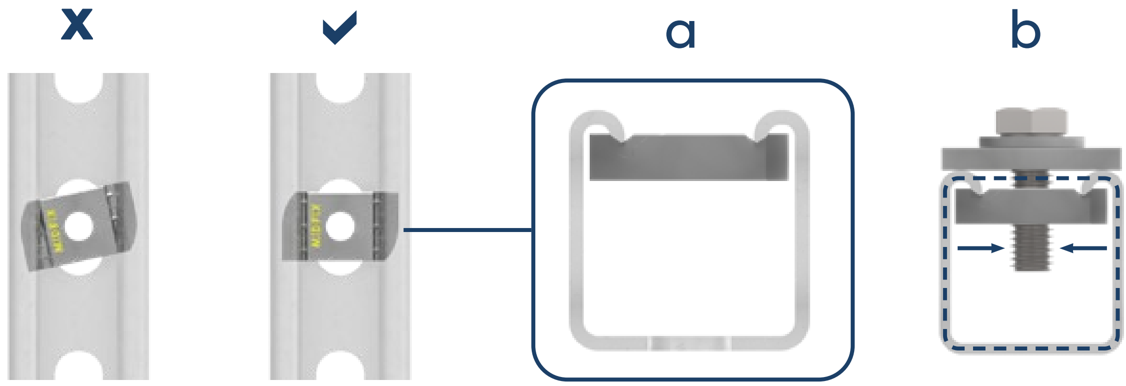
CHANNEL TO CHANNEL BRACKET CONNECTIONS CONT.

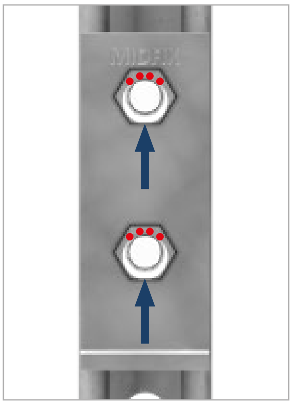
Tightening the Set Screws

Prior to final tightening, it is important to check that the grooves in the channel nuts are properly aligned with the lips of the channel. This is essential for two reasons:

a) The serrations in the grooves must grip the lips of the channel to prevent slippage in the connection

b) The grooves in the channel nut are designed to tie the sides of the channel together to form a strong box section

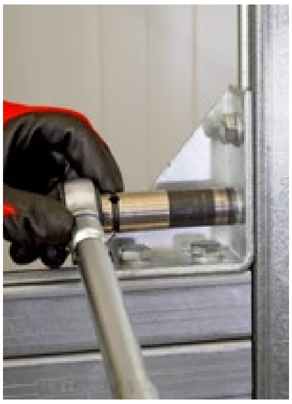




Position the set screws so that they touch the top edge of the bracket holes. This is to prevent movement of the bracket within the hole.

To make safe channel connections it is important that screws are installed in every hole position in the brackets.

Using a cordless impact wrench speeds up the installation and helps maintain alignment of the brackets during tightening. The impact wrench must be set to tighten the screws to less than the final torque requirement.



Finally, using a calibrated torque wrench tighten all the screws to the torque value specified in the MX Technical Book.

CHANNEL TO STEELWORK CONNECTIONS

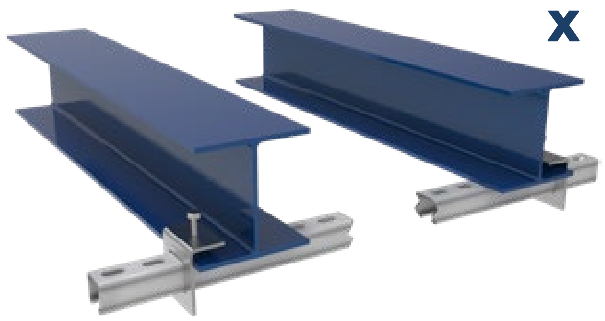
Channel connections to steelwork are critical elements in a support system. This is where the weight of the services is transferred to the building structure.

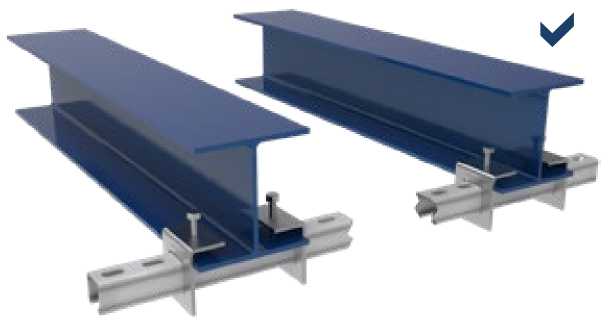
There are several beam clamp types for clamping channel to steelwork each with different load bearing capacities. In selecting a suitable product, it is important to consider:

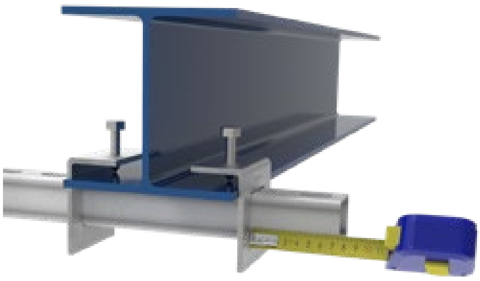
1. The maximum safe load of the beam clamps
2. The maximum steel flange thickness – this must not be exceeded.

Installation

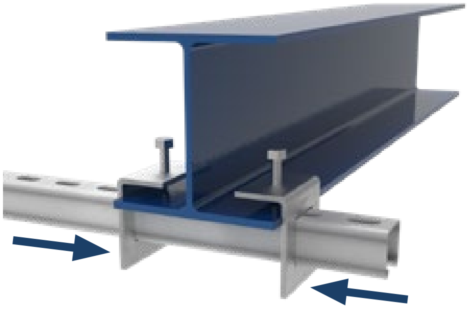
Important – for connections to structural steelwork the ***beam clamps must always be used in pairs*** with one on each side of the beam. This is essential to maintain a parallel connection between the channel and steel flange and achieve the load rating of the connection.



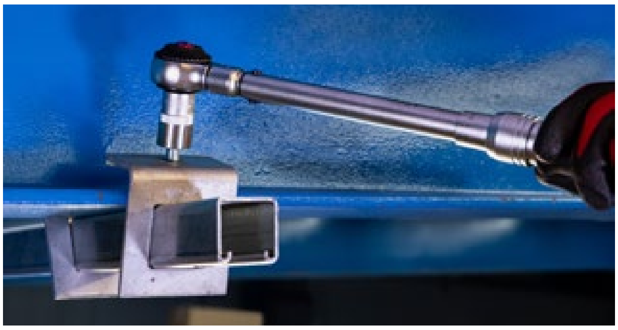




The channel must extend beyond the beam clamp by a minimum of 75mm.



Position the beam clamps close to the flanges of the steel.



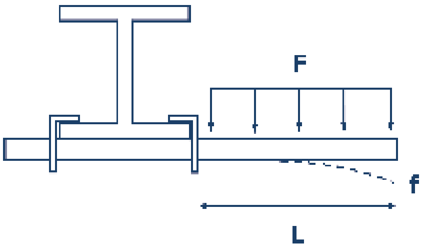
Tighten the bolts or nuts to the torque value specified in the MX Technical Book. This is especially important for cone-pointed screws which bite into the surface of the steel. These are liable to be overtightened which reduces the clamping strength of the connection.

CHANNEL TO STEELWORK CONNECTIONS CONT.

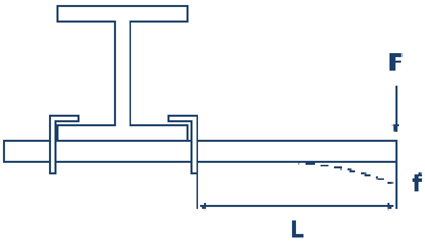
Cantilever applications

MX beam clamps are tested for use in cantilever applications. This is where one end of the channel is unsupported. In this situation the maximum cantilever load for the channel has to be considered as well as the load for the beam clamps.

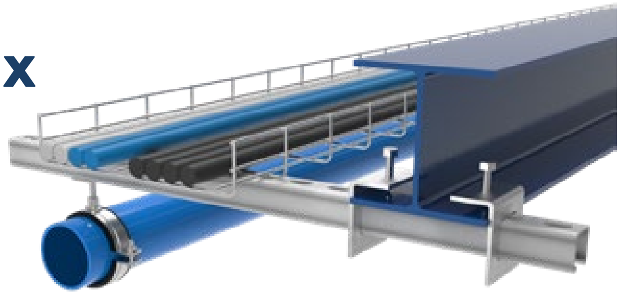
Load 1 – Uniformly Distributed Load



Load 2 – Point Load

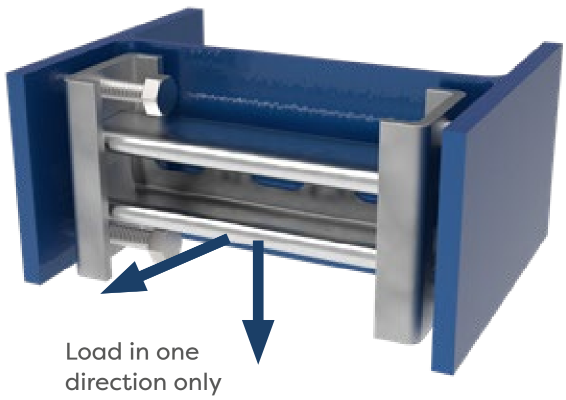


As a matter of course, loads on cantilevers should be positioned as close as practically possible to the steelwork.



Internal Flange Connections

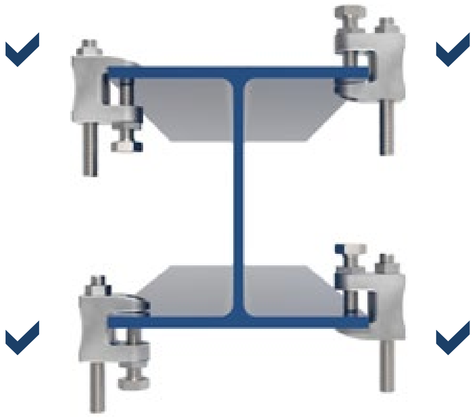
Beam clamps used for clamping channel within the flanges of steelwork are designed to take loads in one direction only.



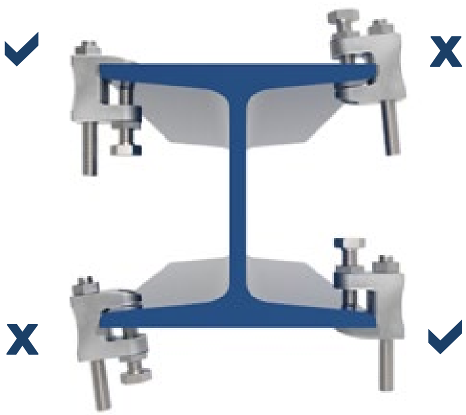
THREADED ROD TO STEELWORK CONNECTIONS

MX malleable iron beam clamps are used for suspending threaded rod from the flanges of structural steel. These use a cup point screw for a secure grip on the steel flanges. To ensure a reliable connection it is important to follow the installation instructions:

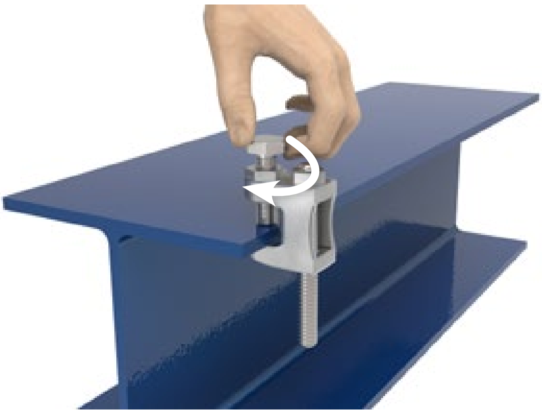
Parallel Steel Flanges – the beam clamp can be installed either way up.

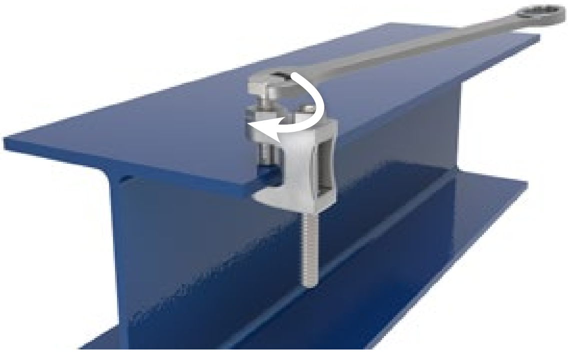


Tapered Steel Flanges – the screw has to grip on the inside of the flange.



Tighten by hand + ½ turn with a spanner

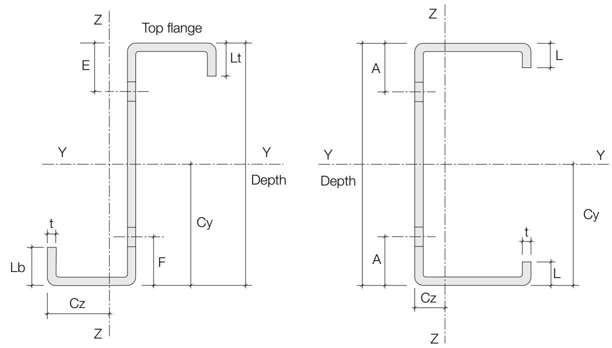




CHANNEL TO PURLIN CONNECTIONS

Special consideration should be given to the subject of supporting loads from purlins. Services are often supported from Z and C-section purlins when the main steels are too far apart, and it is important to understand the limitations around fixing to purlins.

In the first place, permission to support the required load should always be given by the structural engineer or purlin manufacturer.

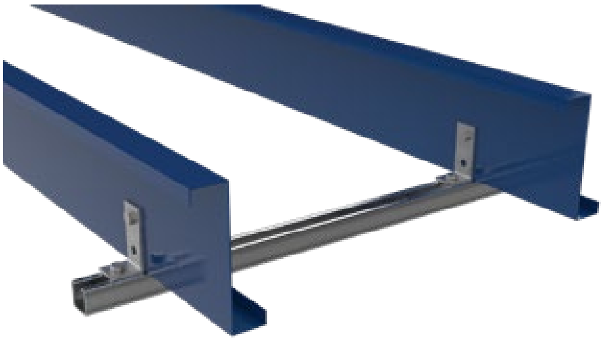


Safe loads that can be applied to the purlin flanges are relatively low and often no more than 15kg -20kg depending on the size of the purlin. When approved, purlin clips should only be used for lightweight services and the clips must be adequately spaced to prevent overloading the purlin flange.

Manufacturer's published loads for spring steel purlin clips can be misleading. These are safe loads for the clips and do not consider the maximum load for the purlin flange. The smaller of these two loads applies to the suspension.

Spring clips do not mechanically lock to the purlin and can detach if they are subject to an upwards force. When there are dynamic loads or the possibility of supports being hit by forklift masts, spring clips should be avoided.

Subject to approval, it is preferable to connect to purlins by drilling the purlin web and using a bracket. This transfers the load to the body of the purlin rather than to the purlin flange. Brackets fixed this way can be used for suspending threaded rod or for channel spanning between purlins.

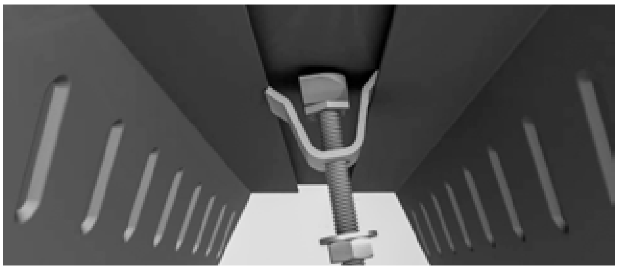


FIXING TO COMPOSITE METAL DECKING

The standard approach for fixing to composite metal deck floor systems is to use proprietary wedge nuts. Wedge nuts may consist of either one or two pieces – two-piece wedge nuts have a wedge and a locking plate.

There are several metal deck systems each with slightly different profiles and slots, and it is important to use the corresponding wedge nut.

Examples of decking profiles and wedge nuts



Assemble the wedge nut, locking plate and hexagon nut on the end of threaded rod and inset into the decking slot.

Turn the wedge part by 90° to engage with the slot

The wedge nut is locked by tightening the nut against the locking plate.

IMPORTANT – to achieve the design load it is important to tighten the nut to the manufacturer's specified torque value.

TRAPEZE BRACKETS

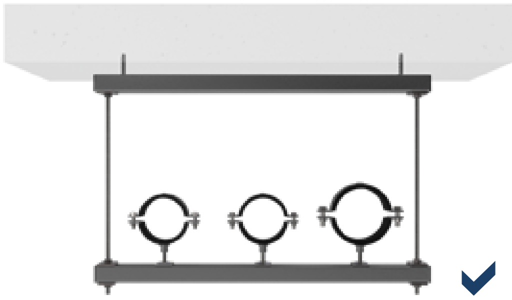
Trapeze brackets are commonly installed using threaded rod. There are many different qualities of threaded rod in the market, often of inferior quality without any testing or load data. MX threaded rod is tested as part of the MX channel system, so it is important to make sure that MX threaded rod is used in the installation.

The MX Technical Book illustrates a range of threaded rod to channel connections with different load capacities. Each design has a unique reference number for inclusion on the bracket drawing.
This reference informs the bracket builder which components to use for the connection and the torque setting for the nuts.

TRAPEZE BRACKETS CONT.

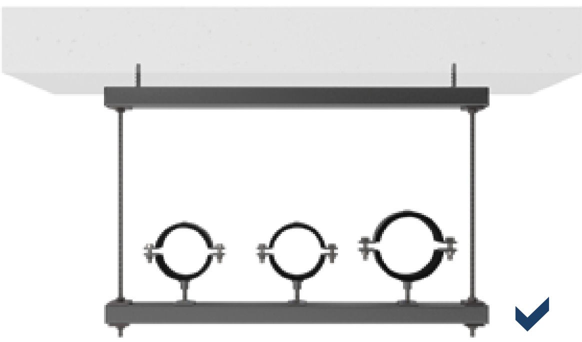
Channel Header Rails

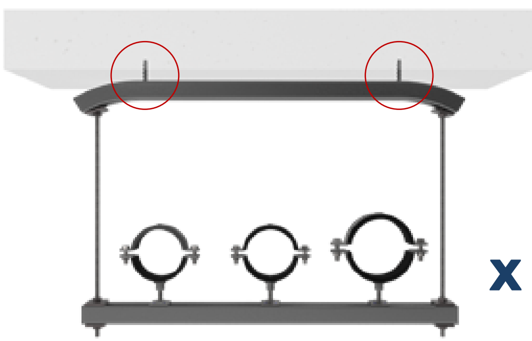
When supporting from channel header rails, make sure the load is distributed as evenly as possible across the header.



The anchors are critical components and should be specified by the relevant project engineer. The installer should make sure they have this information together with the appropriate number of anchors for each header rail.

Install the anchors as close as possible to the drop rods to avoid lever arm loads acting on the header rail and anchors.





CANTILEVER ARMS

Loads on cantilever arms create significant leverage on the back plate. This increases in proportion to the distance of the load from the back plate. The limiting factor for cantilever loads is almost always the strength of the back plate.

As a rule, larger pipes and service loads should always be positioned as near to the back plate as possible.

MX cantilever loads apply to arms fixed directly to load bearing substrates or to channel. To achieve the safe loads, the following must be observed:

1. When fixing arms to channel use the fasteners that are specified in the cantilever arm pages of the MX Technical Book.
2. When fixing to a load bearing substrate the anchors must be adequate for the loads applied to the arms.

ANCHOR CONSIDERATIONS

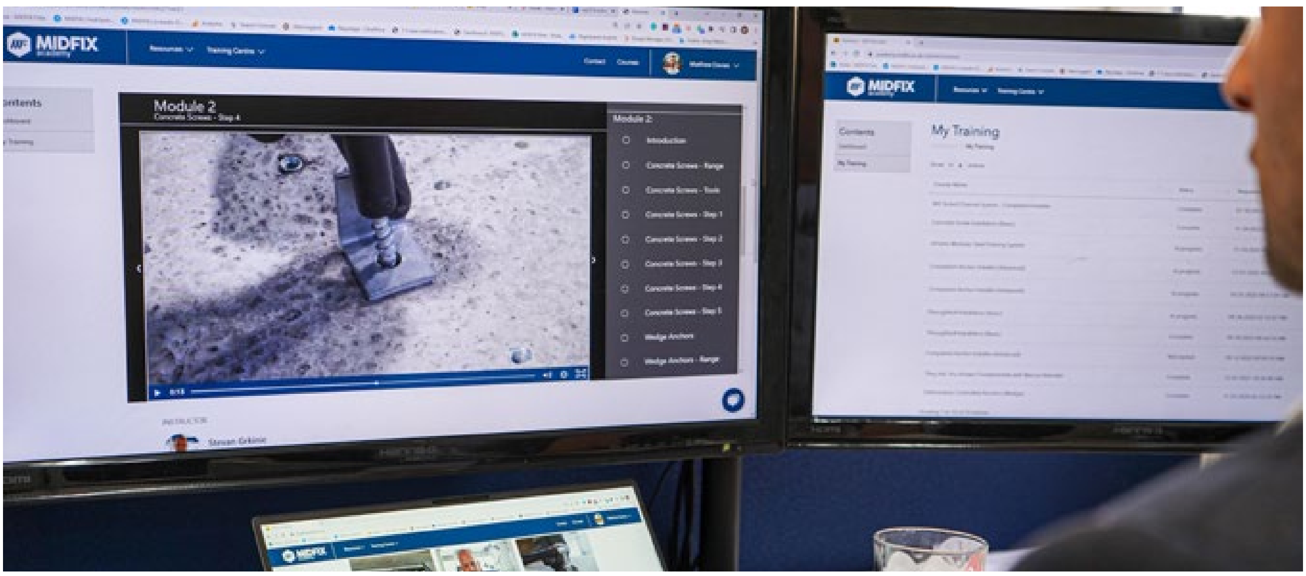
Anchors connect the supports to the building structure and are critical components in the installation.

Anchors are currently the only products in terms of building services supports where there is a specific standard that applies. BS 8539:2012 is the ‘code of practice for the selection and installation of anchors’ and is now widely adopted by the industry.

MIDFIX provides specific anchor training through the MIDFIX Academy programme for BS: 8539 compliance.

For installers of MX channel support systems, there are some important points to be aware of:

1. Incorrect installation is the most common reason for anchors failing.
2. BS 8539: 2012 specifies that ‘Approved Anchors’ should be used wherever possible. This means the anchor needs to have UKTA (UK Technical Assessment) or ETA (European Technical Assessment) approvals.
3. It is important that the anchors are suitable for the application and can support the required loads. The project engineer is responsible for selecting the appropriate anchors for the installation.
4. The installer should be aware of which anchors have been specified and make sure these are being used. Using an alternative or unapproved anchor will invalidate the installation and could lead to costly remedial work.
5. BS 8539 requires that anchors are installed by competent persons that are trained in anchor installation and familiar with the correct installation procedure. This is made easy through the MIDFIX Academy which provides online training for installation of the common anchor types.



MX PRODUCT SELECTION

Large amounts of channel, brackets and threaded rod are used in the building services industry every day. In a competitive market, these products have largely become commodity items purchased solely on price.

It is very common to see building services installations using untested products of unproven performance which have come from many different sources. In this situation it is impossible to verify the load bearing capacity of the supports and prove they are fit for purpose. When product literature is provided it is usually no more than a description of the physical properties of a component with no load data available.

MX channel products are manufactured to MIDFIX product specifications for consistently high quality. MX is intended to be used as a system and extensively tested in physical tests.

With MX, the engineer has reliable load data to use for designing the supports and the integrity of the installation can be proven. This makes it important at procurement and site level to be sure that genuine MX products are specified and installed and for this reason all MX channel products carry the MIDFIX stamp.

STEEL GRADES

BS 6946: 1988 Metal channel cable support systems for electrical installations

This is the British Standard for channel and brackets used to make load bearing supports. While BS 6946 specifically relates to electrical supports, in the absence of other British or European standards, it is generally used as 'the standard' for all types of building services supports.

Perhaps the most important aspect of this standard relates to the dimensions and steel specification used for the manufacture of the channel sections. Non-compliant channel is becoming increasingly common in the market and is generally manufactured from lower strength steel than required by BS 6946. This means that channel not carrying the BS stamp is likely to have inferior performance when compared to compliant channel. All MX channel sections are made to the British Standard and stamped with BS 6946:1988 and the MIDFIX brand as required by the standard.

WHICH FINISH?

When specifying supports it is important to select the correct finish to give the required service life in the particular environment.

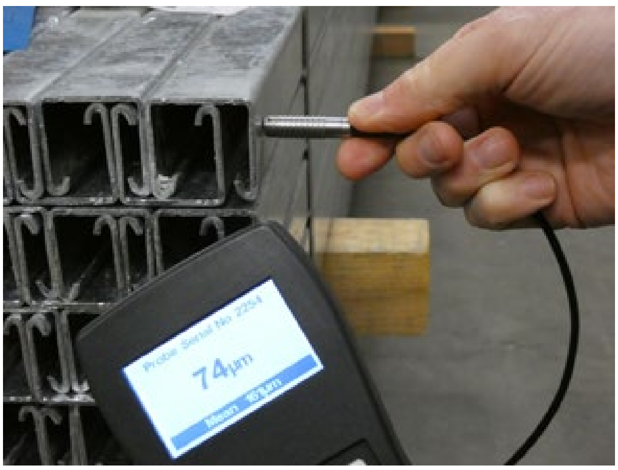
ISO 9223: 2012 'Corrosion of Metal and Alloys' establishes a classification system for the corrosivity of different environments on metals. Environments are classed from C1 to CX in order of corrosivity based on key environmental factors. The estimated service life of a galvanised coating relates directly to the thickness of the coating and the corrosion rate in the particular corrosion classification.

Some environments may need special consideration and it is recommended that a qualified engineer is consulted. Examples of these include:

- Industrial processing plants
- Swimming pools
- Coastal locations
- Tunnels

Pre-galvanised MX channel is made from pre-galvanised steel manufactured to BS EN 10346. In this process steel coil is passed through a galvanising bath and the excess zinc removed to produce a smooth galvanised finish of approximately 20 microns. The ends and edges of the channel are uncoated but receive a degree of corrosion protection from the proximity of the zinc coated surfaces, known as cathodic corrosion protection. Pre-galvanised channel is the standard product for all normal indoor environments and some low corrosion outdoor environments.

Hot dip galvanised MX channel is made from uncoated steel and hot dipped in molten zinc after manufacture to BS EN 1461. This gives a thicker zinc coating of at least 55 microns and means there are no uncoated edges. HDG is a tough finish and gives good corrosion protection in indoor or outdoor environments up to C4 corrosion classification.



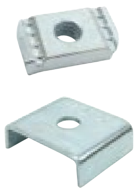
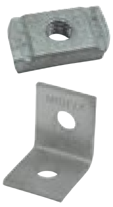
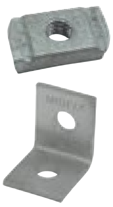
WHICH FINISH? CONT.

MX Components

MX channel brackets are hot dip galvanised to a minimum coating thickness of 55 microns and suitable for use with both PG and HDG channel.

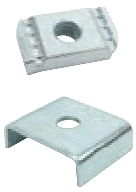
Standard MX channel nuts and some channel washers are electro zinc plated (BZP). Zinc plated parts have a minimum coating thickness of 5 microns and are suitable for indoor applications up to C2 corrosion classification. For indoor applications above C2 and all outdoor installations, hot dip galvanised channel nuts, channel plates and fasteners should be used.

MX PRODUCT FINISHES FOR CORROSION CLASSIFICATIONS C2 – C4

CORROSION CLASSIFICATION (ISO 9223:2012)	EXAMPLES		MX PRODUCT FINISH			*ESTIMATED LIFE
	INDOORS	OUTDOORS	CHANNEL	COMPONENTS	FASTENERS	
UP TO C2 INDOORS	Heated and unheated buildings with low condensation e.g. Offices, schools, hotels, warehouses, sports halls		 Pre-Galvanised	 Zinc Plated	 Zinc Plated	Up to 50 years
UP TO C3	Spaces with moderate condensation and pollution e.g. food-processing, laundries, breweries, dairies	Urban areas with medium pollution	 Pre-Galvanised	 Hot Dip Galvanised	 Hot Dip Galvanised	10 - 29 years
			 Hot Dip Galvanised	 Hot Dip Galvanised	 Hot Dip Galvanised	24 - 70 years
UP TO C4	Spaces with high condensation and pollution from production processes e.g. industrial plants.	Urban areas with high pollution or substantial effect of chlorides e.g. industrial areas, coastal areas without salt spray	 Hot Dip Galvanised	 Hot Dip Galvanised	 Hot Dip Galvanised	12 - 25 years

*Estimated life to first maintenance according to ISO 14713.1:2009

CORROSION CLASSIFICATIONS FOR MX PRODUCTS

FINISH		CORROSION CLASSIFICATION	*ESTIMATED LIFE
Pre-Galvanised Channels		Up to C3	**10 - 29 years**
Hot Dip Galvanised Channels		Up to C4	**13 - 26 years**
Zinc Plated Components		Up to C2 indoors	**up to 50 years**
Hot Dip Galvanised Components		Up to C4	**13 - 26 years**
Zinc Plated Fasteners		Up to C2 indoors	**up to 50 years**
Hot Dip Galvanised Fasteners		Up to C4	**12 - 25 years**

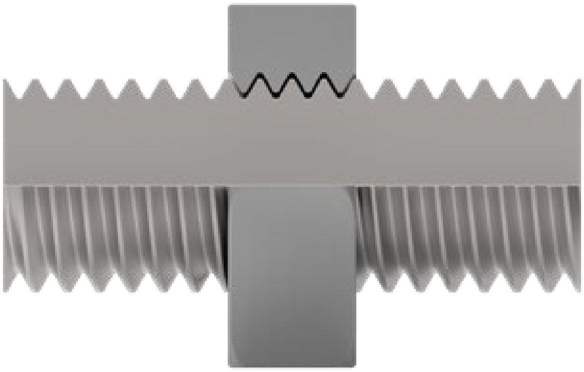
*Estimated life to first maintenance according to ISO 14713.1:2009

THREADED ROD

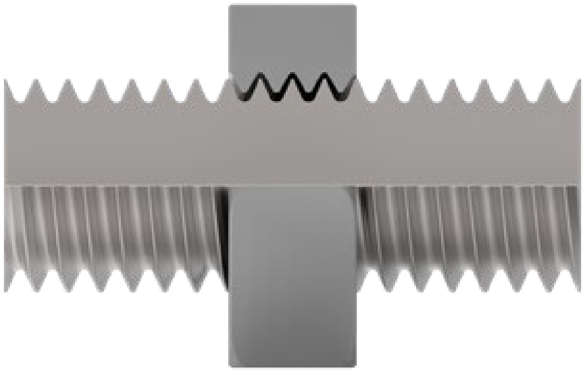
Threaded rod is used in vast quantities for suspending building services supports and is often used as a benchmark product for checking prices. In result this has driven down quality to the point where it often bears little resemblance to the original standards.

Threaded rod can be made more cheaply by using smaller diameter steel wire and increasing the depth of the threads. The outside diameter of the rod remains the same, but the core diameter is smaller, and the thread angle reduced.

This means the threads are taller and thinner, making them weak and liable to stripping under load. Tell-tale signs are threads that are visibly thin, rod that is bendy and nuts that are loose and wobbly.



Normal thread engagement



Engagement with reduced thread angle

There is undoubtedly a lot of threaded rod which is potentially unfit for purpose and where the true performance and load bearing capacity is not known.

In contrast, MX threaded rod is manufactured to established MIDFIX specifications and independently tested. MX threaded rod is tested with standard nuts and channel nuts to replicate how it is actually used and establish meaningful safe working loads.

All design loads for MX supports are based on using MX threaded rod. MX threaded rod has a distinctive coloured wrapping and MIDFIX product labels to distinguish it from other products in the market.

FASTENERS

It is important to make sure the right fasteners are used with the MX channel system. These are standard industry parts and any manufacturer's products made to the specified standards and grades can be used. It is also important to choose between zinc plated and hot dip galvanised finishes depending on the corrosion requirements of the installation.

MX Fastener Standards

FASTENERS		STANDARD	GRADE/CLASS	FINISH
 	Hexagon Set Screws	DIN 933	8.8	Bright Zinc Plated/ Hot Dip Galvanised
 	Hexagon Nuts	DIN 934	8	Bright Zinc Plated/ Hot Dip Galvanised
 	Washers	DIN 125		Bright Zinc Plated/ Hot Dip Galvanised

ANCHORS

Anchors are the most critical components in building services supports installations. Selecting the right anchors is usually the responsibility of the project engineer often with advice from the anchor manufacturer.

The selection process identifies anchors with the required load capacity for the application. Where the exact nature of the substrate is unknown, it is necessary to test the anchors on site. To satisfy the requirements of BS 8539:2012, it is also important that the anchor has suitable approvals for the applications in question.

Once the anchors are selected it is important to specify this information at site level and through the procurement process. Fixings specification boards are an effective way of creating awareness on site of the approved anchors.

Changing from the specified anchors, even to another manufacturer's product of the same size and type, will necessitate repeating the selection and site testing process.

MX DESIGN CONSIDERATIONS

These instructions describe how to read the information contained within the MX Technical Book and the steps that can be followed to design routine building services supports using the MX channel system.

The MX load data allows a competent person to design a range of common supports such as trapeze brackets, goal posts, and simple 2D and 3D frames.

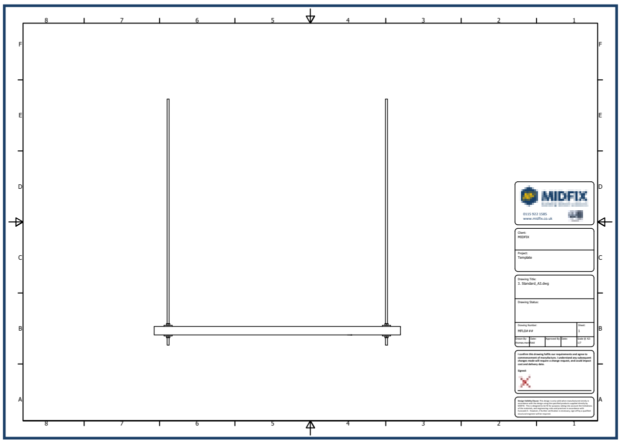
Firstly, it is important for the support bracket designer to understand the maximum loads that can be applied to the channel sections (bearers). Secondly, the designer must be aware of how the connections (joints) perform and the maximum applied loads for the different connections.

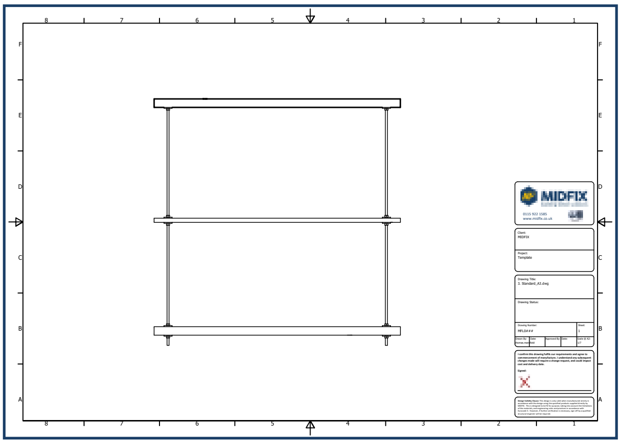
When all the channel and connection loads are known, the final consideration is the loads for the anchors or fixings. MX incorporates both the channel and anchors in one system making it simple to consider all the loads together. The lowest of all these loads will equate to the maximum allowable load for the support.

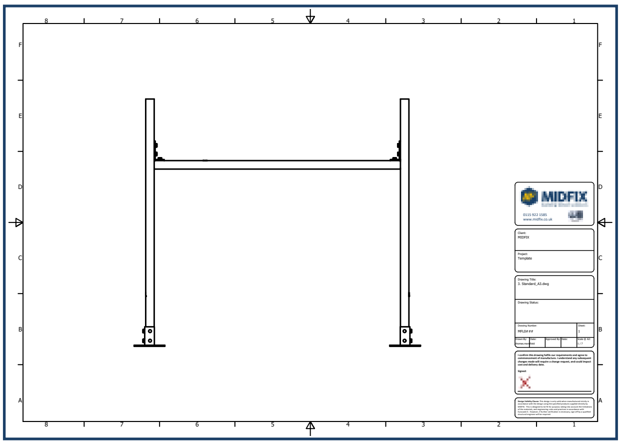
Notes:

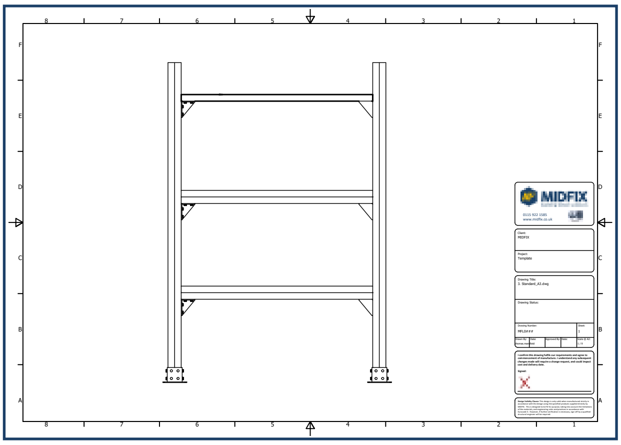
1. *MX channel system load data is published as weights. i.e., Kilograms. The intention is to make the loads relevant and understandable at site level.*
2. *Where supports require more complex considerations these should be referred to the MIDFIX Design and Engineering team or another suitably qualified engineer. Examples of these include: high service loads; wind and other dynamic loads including pipe expansion; roof foot pressure calculations; taller support frames where stability must be considered.*

Examples of common building services supports designed using MX load data









PRE-DESIGN CONSIDERATIONS

Environment

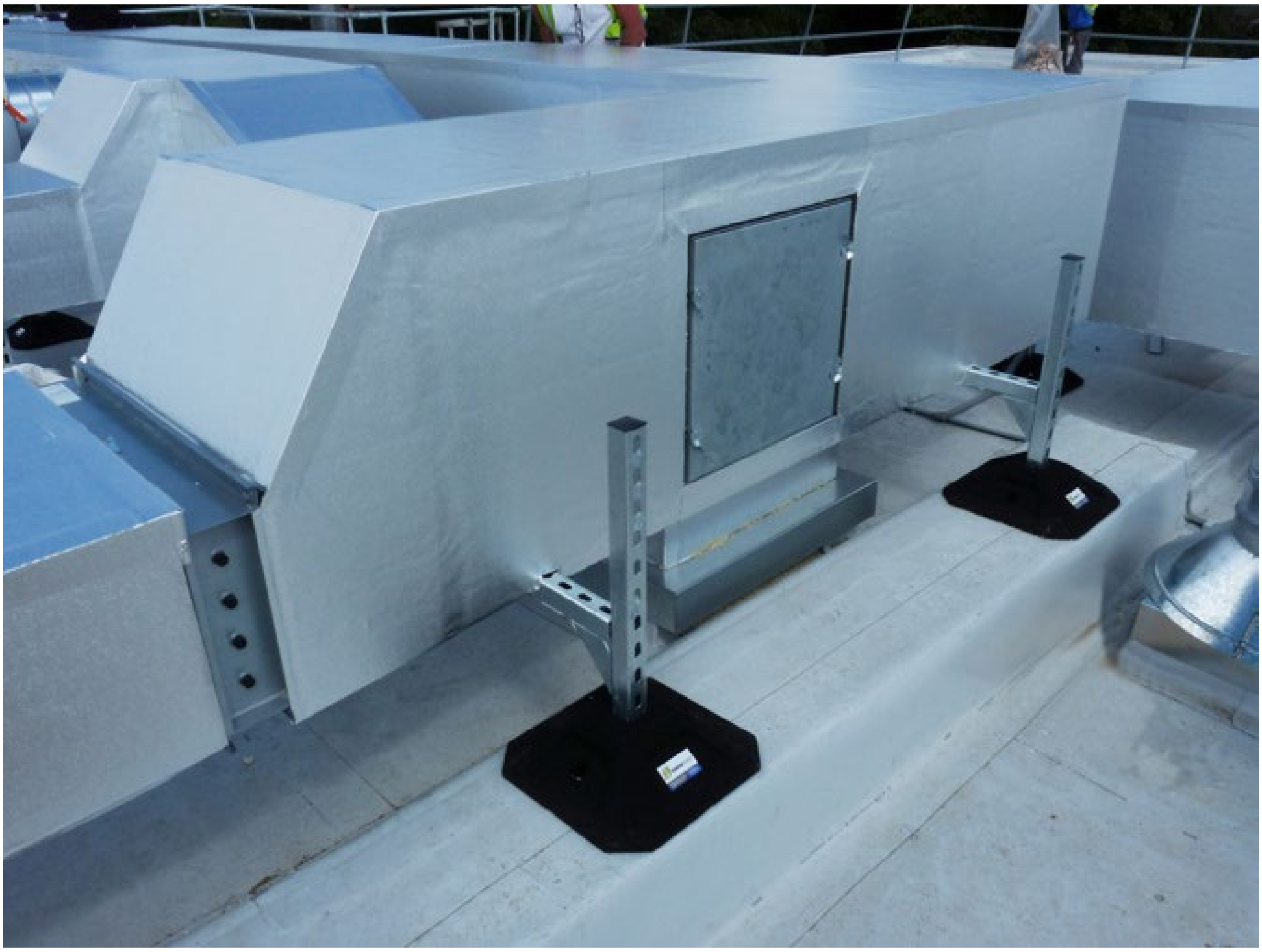
Before designing the supports it is important to consider the environment in which they are being used to select the correct product finish to give the required service life.

MX channel is available in pre-galvanised and hot dip galvanised finishes. MX components are available in electro zinc plated and hot dip galvanised finishes.

In general, the finish is selected according to the ISO 9223: 2012 corrosion classification of the project. Some environments will need special consideration and it is recommended that a qualified engineer is consulted. Examples of these include:

- Industrial processing plants
- Swimming pools
- Coastal locations
- Tunnels

For help with selecting the correct finish, consult the detailed product information and MX corrosion classification tables on pages 108-111.



PRE-DESIGN CONSIDERATIONS CONT.

Applied Loads

Before any kind of support bracket can be designed you will need to understand the applied loads.

An applied load is the total force acting on the support. The total applied load will be needed to ascertain the channel profile, the connection details and finally this information will be needed for the anchor specification.

Total loads will include cable weights, and for pipework, filled weights and insulation.

The positioning of the applied load also needs considering. Loads are often biased to one side of a support frame. If this is the case the worst-case values should always be used so that one side of the support frame does not become overloaded.

When designing supports it is always recommended to build a redundancy factor into the design. This allows capacity should additional services be added and importantly some margin to cover loads that could be applied during installation from cable pulling for example.

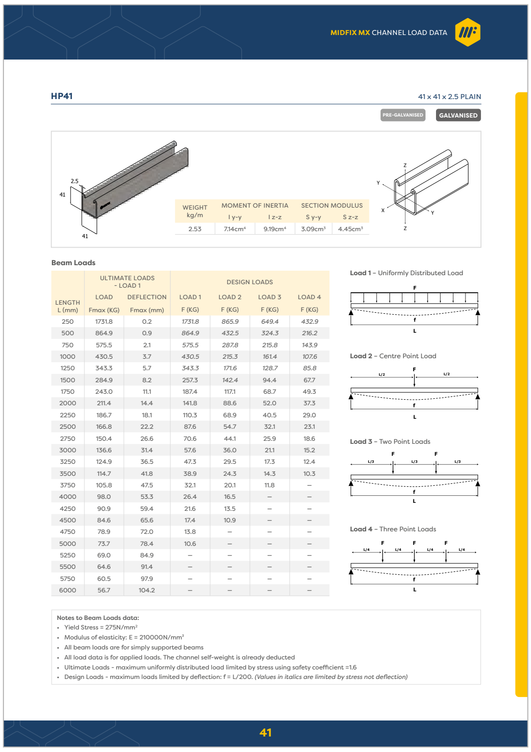
NOTE: All MX published load data is for static and quasi-static loads. For dynamic loads you should consult MIDFIX Design and Engineering.

CHANNEL LOAD DATA

Understanding how the channel performs under load is vitally important as this area is often the weakest link in the support bracket.

The MX channel load data section on pages 40-55 gives comprehensive load data for Beam Loads, Cantilever Loads and Column Loads.

NOTE: For simplicity, all MX channel loads are for applied loads. (i.e. the self-weight of the channel is already deducted from the published loads)



MIDFIX MX CHANNEL LOAD DATA

HP41 — 41 x 41 x 2.5 PLAIN

PRE-GALVANISED GALVANISED

WEIGHT kg/m	MOMENT OF INERTIA I y-y	MOMENT OF INERTIA I z-z	SECTION MODULUS S y-y	SECTION MODULUS S z-z
2.53	7.14cm⁴	9.19cm⁴	3.09cm³	4.45cm³

Beam Loads

LENGTH L (mm)	ULTIMATE LOADS - LOAD 1: LOAD Fmax (KG)	ULTIMATE LOADS - LOAD 1: DEFLECTION Fmax (mm)	DESIGN LOADS: LOAD 1 F (KG)	DESIGN LOADS: LOAD 2 F (KG)	DESIGN LOADS: LOAD 3 F (KG)	DESIGN LOADS: LOAD 4 F (KG)
250	1731.8	0.2	*1731.8*	*865.9*	*649.4*	*432.9*
500	864.9	0.9	*864.9*	*432.5*	*324.3*	*216.2*
750	575.5	2.1	*575.5*	*287.8*	*215.8*	*143.9*
1000	430.5	3.7	*430.5*	*215.3*	*161.4*	*107.6*
1250	343.3	5.7	*343.3*	*171.6*	*128.7*	*85.8*
1500	284.9	8.2	257.3	*142.4*	94.4	67.7
1750	243.0	11.1	187.4	117.1	68.7	49.3
2000	211.4	14.4	141.8	88.6	52.0	37.3
2250	186.7	18.1	110.3	68.9	40.5	29.0
2500	166.8	22.2	87.6	54.7	32.1	23.1
2750	150.4	26.6	70.6	44.1	25.9	18.6
3000	136.6	31.4	57.6	36.0	21.1	15.2
3250	124.9	36.5	47.3	29.5	17.3	12.4
3500	114.7	41.8	38.9	24.3	14.3	10.3
3750	105.8	47.5	32.1	20.1	11.8	–
4000	98.0	53.3	26.4	16.5	–	–
4250	90.9	59.4	21.6	13.5	–	–
4500	84.6	65.6	17.4	10.9	–	–
4750	78.9	72.0	13.8	–	–	–
5000	73.7	78.4	10.6	–	–	–
5250	69.0	84.9	–	–	–	–
5500	64.6	91.4	–	–	–	–
5750	60.5	97.9	–	–	–	–
6000	56.7	104.2	–	–	–	–

Load 1 – Uniformly Distributed Load

Load 2 – Centre Point Load

Load 3 – Two Point Loads

Load 4 – Three Point Loads

Notes to Beam Loads data:
- Yield Stress = 275N/mm²
- Modulus of elasticity: E = 210000N/mm²
- All beam loads are for simply supported beams
- All load data is for applied loads. The channel self-weight is already deducted
- Ultimate Loads - maximum uniformly distributed load limited by stress using safety coefficient =1.6
- Design Loads - maximum loads limited by deflection: f = L/200. *(Values in italics are limited by stress not deflection)*

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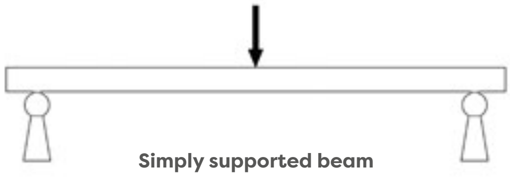
CHANNEL LOAD DATA CONT.

Beam Loads

A channel acts as a beam when it is spanning two points and is loaded perpendicular to its length.

Applying a beam load will cause the channel to deflect (sag). We need to ensure that the maximum stress for the profile is not exceeded, and the deflection is kept within an acceptable limit. Therefore, for any given length the maximum allowable load must not be exceeded.

NOTE: MX load data is for simply supported beams – this is where the channel is provided with adequate lateral restraint to resist buckling but is not rigidly fixed in a way that resists the channel deflecting. This gives a cautious load situation most suited for general application.



Simply supported beam

How do we determine the maximum allowable load for a given length of channel?

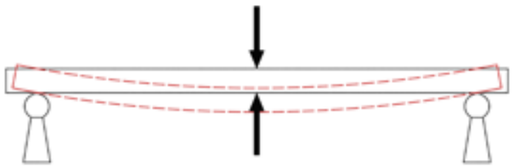
The MX channel load tables give beam load data for all channel profiles from 250mm to 6m span in most cases. Load data is provided in two formats:

- Ultimate Loads
- Design Loads

Ultimate Loads are the absolute maximum loads that can be applied to the channel where deflection is not a consideration. Ultimate Loads are limited by the maximum stress that can be applied to the section and include a factor of safety (FOS) determined in the steelwork design codes.

Design Loads are limited by the deflection of the channel section. The maximum permitted deflection is 1/200 of the span. This is recognised as a visually acceptable level of deflection and prevents excessive movement of the services that are being supported.

Therefore, the clue is in the name, when designing use the 'Design Loads'



Deflection limited to L/200

CHANNEL LOAD DATA CONT.

Beam Loads cont.

The MX channel load tables provide the designer with 4 load variants:

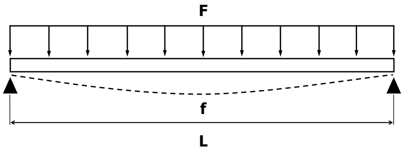
- Load 1. Uniformly distributed load. (UDL)
- Load 2. Centre point load.
- Load 3. Two point loads.
- Load 4. Three point loads.

A load concentrated onto a very small length of the beam is a point load. An example of these is pipes, and in practice the majority of building services loads are point loads.

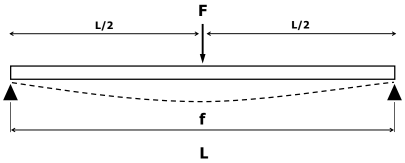
A load spread evenly over the length of the beam is a uniform load. Cable trays with an even distribution of cables are usually treated as uniform loads. However, cable ladders are different because the sides of the ladder apply point loads to the beam.

When there are multiple services supported on the same beam, or a combination of point loads and uniform loads, the load analysis can be quite complex. However, a simplified approach can be followed by adding up all the weights and applying the total weight as a centre point load. This gives a 'worst case' result and ensures the channel will not be overloaded.

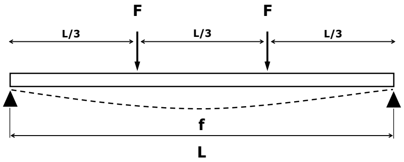
Load 1 – Uniformly Distributed Load



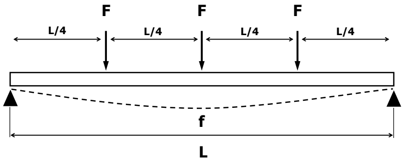
Load 2 – Centre Point Load



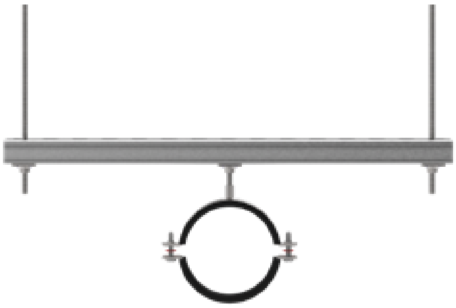
Load 3 – Two Point Loads



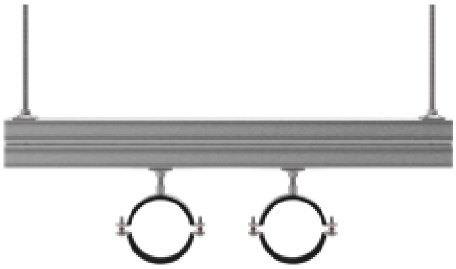
Load 4 – Three Point Loads



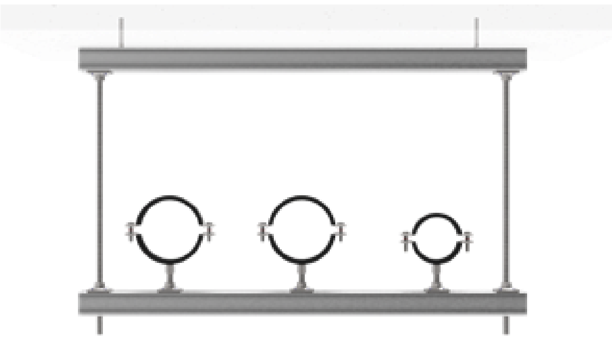
Examples of how to consider different service loads



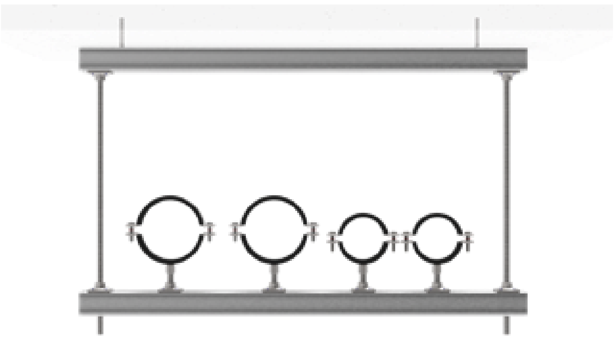
Centre Point Load



2 Point Load

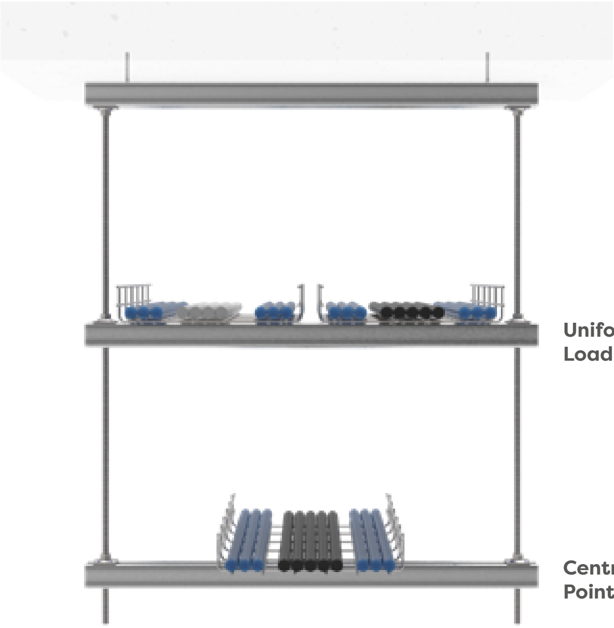


3 Point Load



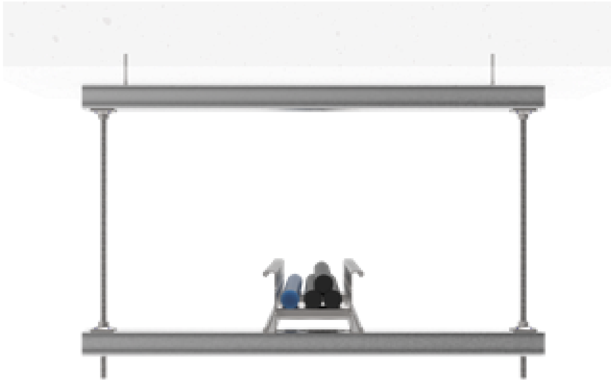
Multiple Point Loads – apply total load as centre point load

CHANNEL LOAD DATA CONT.

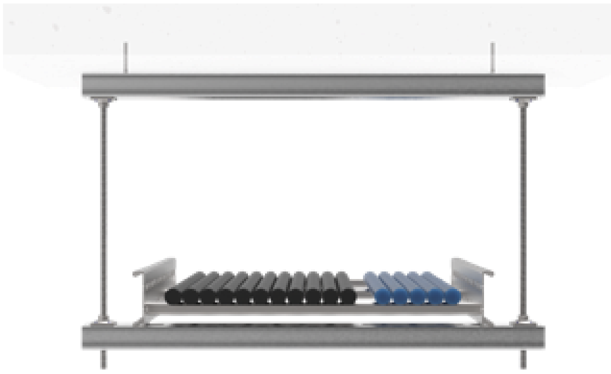


Uniform Load

Centre Point Load



Centre Point Load – applies when the cable ladder is inside the 2-point load positions



2 Point Load (applies when the cable ladder is on or outside the 2 point load positions)

CHANNEL LOAD DATA CONT.

Cantilever Beam loads

A cantilever beam is a fixed-end beam that is supported at one end only. Channel which is clamped at one end to steelwork using a pair of beam clamps is a common example of a cantilever beam.

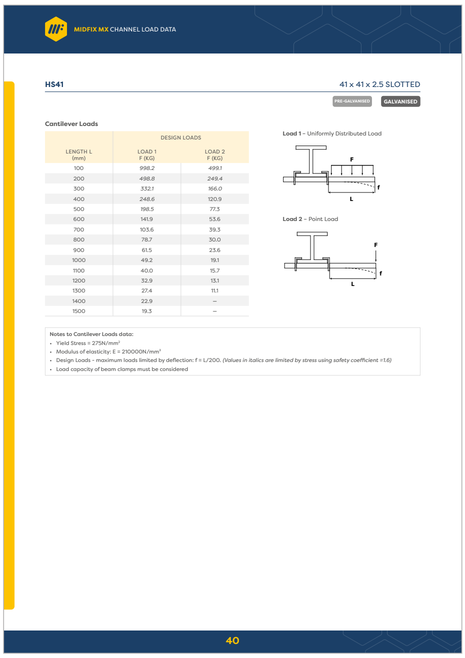
The MX cantilever beam load tables give design loads for:

- Load 1. Uniformly distributed load. (UDL)
- Load 2. End point load

Cantilever design loads have a maximum permitted deflection of 1/150 of the length of the arm.

When there are several loads applied to the cantilever beam, these should be added together and applied as a 'worst case' end point load.

For cantilever loads it is also important to consider the load capacity of the beam clamps and the primary steel.



MIDFIX MX CHANNEL LOAD DATA

HS41 — 41 x 41 x 2.5 SLOTTED

PRE-GALVANISED GALVANISED

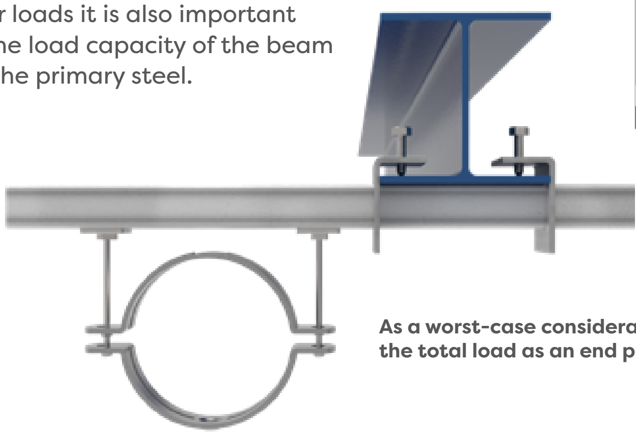
Cantilever Loads

LENGTH L (mm)	DESIGN LOADS LOAD 1 F (KG)	LOAD 2 F (KG)
100	*998.2*	*499.1*
200	*498.8*	*249.4*
300	*332.1*	*166.0*
400	*248.6*	120.9
500	*198.5*	77.3
600	141.9	53.6
700	103.6	39.3
800	78.7	30.0
900	61.5	23.6
1000	49.2	19.1
1100	40.0	15.7
1200	32.9	13.1
1300	27.4	11.1
1400	22.9	–
1500	19.3	–

Notes to Cantilever Loads data:

- Yield Stress = 275N/mm^2
- Modulus of elasticity: E = 210000N/mm^2
- Design Loads - maximum loads limited by deflection: f = L/200. *(Values in italics are limited by stress using safety coefficient =1.6)*
- Load capacity of beam clamps must be considered

40



As a worst-case consideration apply the total load as an end point load

CHANNEL TO CHANNEL CONNECTIONS

A channel-to-channel connection will be required when building a frame. This applies to both 2D and 3D frame design.

Brackets used for channel connections all work on the same principle, they connect one piece of channel to another while tying the open sides of the channel into a strong box section by clamping the lips of the channel between the bracket and the channel nut.

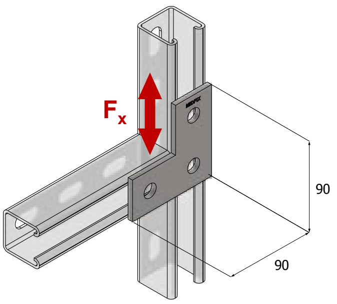
The comprehensive range of MX brackets makes it possible to design numerous support configurations. A key difference with MX is the extensive load data provided for the bracket connections making it possible to prove the load capacities of a wide range of frame designs.

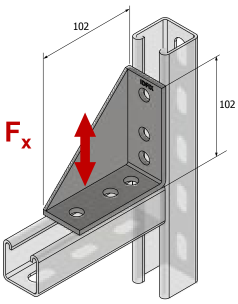
MX channel brackets can be found on pages 16-27 with drawings and load data for different connection designs.

NOTES:

1. MX load data is uniquely intended for building services supports and connections are tested with M10 fasteners as predominantly used in the industry. Connections are also tested with M12 fasteners with load data available on request.

2. Where the connection load applies in either direction, this is indicated on the drawings by a double-headed arrow.





3. To realise the maximum safe working load on all MX connections the specified fasteners and required installation torque must be used.

CHANNEL TO THREADED ROD CONNECTIONS

Connecting the bearer (channel) to threaded rod is one of the fundamental joints in building a trapeze suspension support. These connections can be either 'through connections' or 'blind connections'.

Through Connections

These are where the threaded rod passes all the way through the channel. The channel is clamped to the threaded rod with a nut and MX washer on either side of the connection.

Pages 61-63 show the through connection designs with their respective maximum safe working loads.

Each connection design has a reference number that can be included on the drawing to inform the bracket fabricator which MX components to use.

Blind Connections

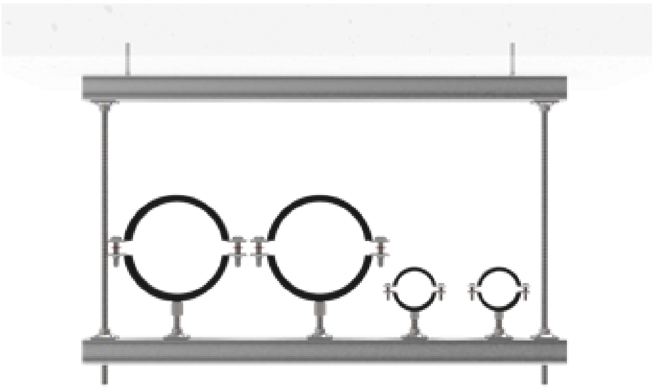
These are where the threaded rod terminates at the bearer (channel) as illustrated on page 64 in the MX Technical Book. This is typically used where the trapeze is suspended from a channel header rail.

Unlike the through connection, the channel cannot be clamped on both sides, and it is important that the "C" section is closed off using MX washers and channel nuts.

NOTES:

1. All channel to threaded rod load data is for loads in tension.

2. When the load is biased to one side of the support, a simplified 'worst-case' approach is to apply the total load on the bearer to each threaded rod.



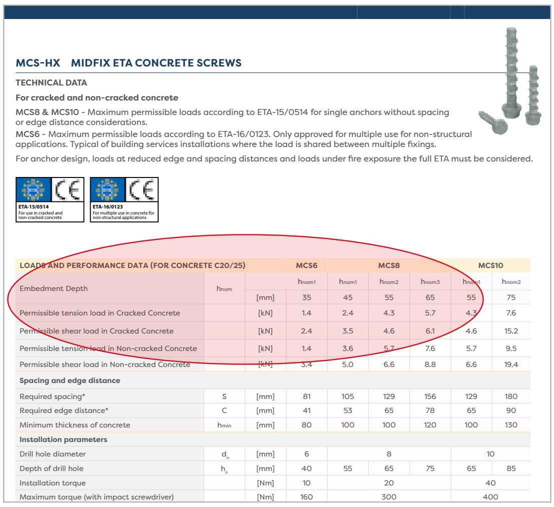
Biased load – apply total load to each threaded rod for worst-case result

CHANNEL TO SUBSTRATE CONNECTION

When fixing channel to a substrate, as for example in the case of header rails, we need to consider the following points:

1. Anchor selection - following BS 8539 and specifying the correct anchor is essential. The permissible load for the anchor in the particular substrate must exceed the applied load from the support.

NOTE: See pages 72-88 for permissible loads, spacings, embedment depths and other technical data for MIDFIX anchors.



MCS-HX MIDFIX ETA CONCRETE SCREWS

TECHNICAL DATA

For cracked and non-cracked concrete

MCS8 & MCS10 - Maximum permissible loads according to ETA-15/0514 for single anchors without spacing or edge distance considerations.

MCS6 - Maximum permissible loads according to ETA-16/0123. Only approved for multiple use for non-structural applications. Typical of building services installations where the load is shared between multiple fixings.

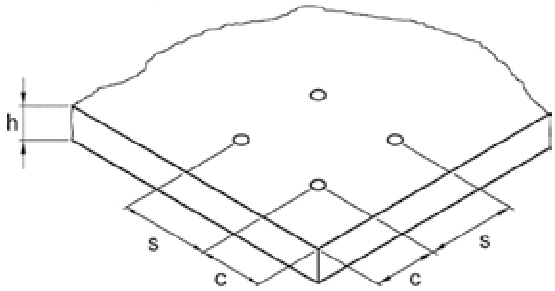
For anchor design, loads at reduced edge and spacing distances and loads under fire exposure the full ETA must be considered.

ETA-15/0514 For use in cracked and non-cracked concrete

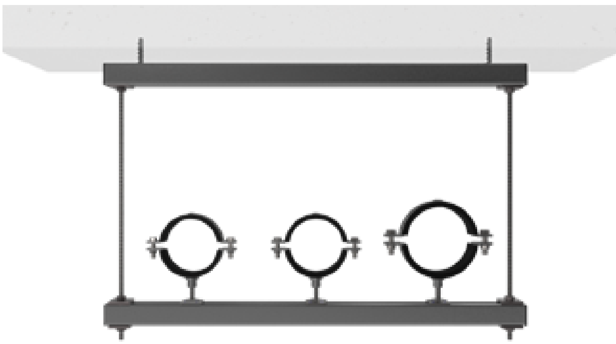
ETA-16/0123 For multiple use in concrete for non-structural applications

LOADS AND PERFORMANCE DATA (FOR CONCRETE C20/25)			MCS6	MCS8			MCS10	
Embedment Depth	h_{nom}		h_{nom1}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}
		[mm]	35	45	55	65	55	75
Permissible tension load in Cracked Concrete		[kN]	1.4	2.4	4.3	5.7	4.3	7.6
Permissible shear load in Cracked Concrete		[kN]	2.4	3.5	4.6	6.1	4.6	15.2
Permissible tension load in Non-cracked Concrete		[kN]	1.4	3.6	5.7	7.6	5.7	9.5
Permissible shear load in Non-cracked Concrete		[kN]	3.4	5.0	6.6	8.8	6.6	19.4
Spacing and edge distance								
Required spacing*	S	[mm]	81	105	129	156	129	180
Required edge distance*	C	[mm]	41	53	65	78	65	90
Minimum thickness of concrete	h_{min}	[mm]	80	100	100	120	100	130
Installation parameters								
Drill hole diameter	d_o	[mm]	6	8			10	
Depth of drill hole	h_o	[mm]	40	55	65	75	65	85
Installation torque		[Nm]	10	20			40	
Maximum torque (with impact screwdriver)		[Nm]	160	300			400	

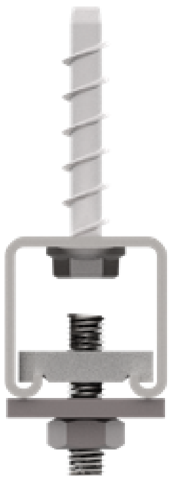
2. The number of anchors and spacings – how many anchors are required to support the overall load and the minimum spacing requirements for the anchors.



3. Anchor positions – drop rods need to be as close as possible to the fixing points to minimise any bending moments on the header rail. Additional anchors may be needed to resist the channel deflecting due to point loads.



4. Anchor pull-through – this is the load at which the head of the anchor pulls through the slots of the channel. Maximum safe loads for anchor pull through are provided on page 64.



THREADED ROD TO SUBSTRATE CONNECTION

Threaded rod can be connected directly to the substrate using either wedge anchors or concrete screw rod hangers.

Following BS 8539 and specifying the correct anchor is essential. The permissible load for the anchor in the particular substrate must exceed the applied load from the threaded rod.

NOTES:

1. See pages 72-88 for permissible loads, spacings, embedment depths and other technical data for MIDFIX anchors.

2. The threaded rod will require a locking nut to be applied to the rod-anchor connection.

DESIGN EXAMPLES

Trapeze Bracket

Designing a trapeze suspension serves two purposes:

- It allows for the applied load to be safely suspended by the trapeze through load data evidence.
- It enables the designer to optimise the design while ensuring the applied load is still carried safely.

How do we use the MX Technical Book to design a trapeze drop?

Within a trapeze suspension there are 4 key elements which need to be considered:

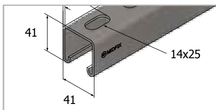
1. The load bearer (channel)
2. The threaded rod
3. The connections between the threaded rod and the load bearer (channel)
4. The connection to the substrate

When all 4 of these elements are known we can design a trapeze bracket to suit the application and provide the evidence.

1. The load bearer (channel)

For each level on the trapeze, look at the applied load to the channel. If the load distribution is not known or complex, then use the worst-case scenario and apply the total load as a centre point load.

Select the appropriate channel profile to suit the load and record the maximum safe load (design load) for the channel.



WEIGHT kg/m	MOMENT OF INERTIA I y-y	MOMENT OF INERTIA I z-z	SECTION S y-y
2.41	6.03cm⁴	9.14cm⁴	2.85cm³

Beam Loads

LENGTH L (mm)	ULTIMATE LOADS - LOAD 1: LOAD Fmax (KG)	ULTIMATE LOADS - LOAD 1: DEFLECTION Fmax (mm)	DESIGN LOADS: LOAD 1 F (KG)	DESIGN LOADS: LOAD 2 F (KG)	DESIGN LOADS: LOAD 3 F (KG)	DESIGN LOADS: LOAD 4 F (KG)
250	1597.0	0.3	*1597.0*	*798.5*	*598.9*	*399.2*
500	797.6	1.0	*797.6*	*398.8*	*299.1*	*199.4*
750	530.7	2.3	*530.7*	*265.3*	*199.0*	*132.7*
1000	396.9	4.0	*396.9*	*198.5*	*148.9*	*99.2*
1250	316.4	6.2	314.1	*158.2*	115.2	*79.1*
1500	262.6	8.9	216.6	*131.3*	79.4	57.0
1750	223.9	12.1	157.5	98.4	57.8	41.5
2000	194.8	15.7	119.0	74.4	43.6	31.3
2250	172.0	19.8	92.4	57.7	33.9	24.3
2500	153.6	24.2	73.1	45.7	26.8	19.3
2750	138.5	29.1	58.8	36.7	21.6	15.5

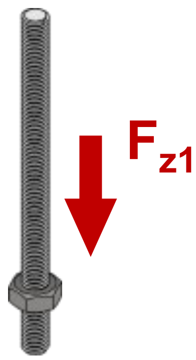
2. The threaded rod

The M&E industry tend to default to M10 rod. Using the MX trapeze data select the required rod diameter depending on your applied load.

You can optimise your design by utilising a smaller diameter if safe to do so or simply use the MX load data to reassure your M10 selection.

When the load is biased to one side of the support, a simplified 'worst-case' approach is to apply the total load on the bearer to each threaded rod.

Make a note of the maximum safe load for the threaded rod



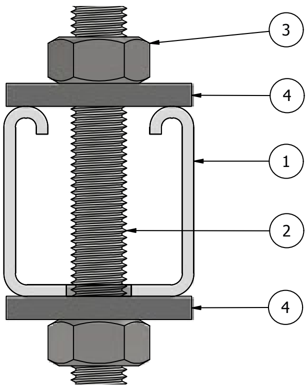
Trapeze Bracket cont.

3. The connection details

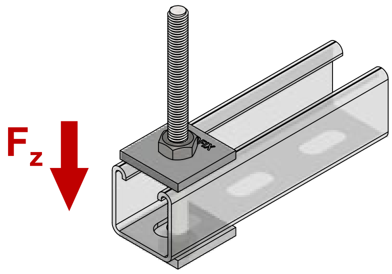
The connections between the threaded rod and channel need to be quantified. This applies to through and blind connections. Use the MX connection designs for the channel and threaded rod combination selected.

Make a note of the maximum safe loads for the connections.

CONNECTION REFERENCE	MAX SAFE LOAD F_Z (KG)
M12TBC3	689



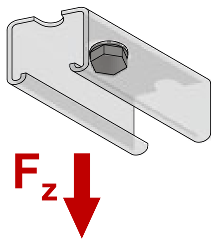
PARTS LIST	
ITEM	DESCRIPTION
1	HS41 MX Channel
2	M12 MX Threaded Rod
3	M12 DIN 934 Nuts - Class 8
4	FB101/12 MX Channel Washer



4. The connection to the substrate.

Using your specified anchor information:

Make a note of the permissible load for each anchor. For header rails make a note of the pull through load for the anchors.



Overall Safe Load for the Trapeze

You now have the maximum safe loads for each element of your trapeze. The overall safe load for the support is whichever is the lowest value.

DESIGN EXAMPLES

Frames

Goal posts and H-Frames are examples of common building services support frames that can be easily designed using the MX load data. Simple bird-cage type frames can be similarly designed. Another example is a trapeze style frame where the frame is anchored to the ceiling.

NOTE: Frames which are carrying high loads should be referred to MIDFIX Design and Engineering or a qualified engineer. This also applies to taller frames, typically over 2m in height, and any frames where stability, bracing and wind loads need to be considered.

How do we use the MX Technical Book to design a simple frame:

There are 5 elements which need to be considered:

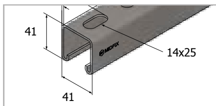
1. The horizontal channels (load bearers)
2. The vertical channels (columns)
3. The channel-to-channel connections
4. The base plates
5. The connection to the substrate

When each of these elements are known we can design a support frame that meets the load requirements and provide the evidence.

1. The horizontal channels (load bearers)

The frame may have single or multiple levels. For each level, look at the applied load to the channel. If the load distribution is not known or complex, then use the worst-case scenario and apply the total load as a centre point load.

Select the appropriate channel profile to suit the load and make a note of the maximum safe load (design load) for the channel.



WEIGHT kg/m	MOMENT OF INERTIA I y-y	MOMENT OF INERTIA I z-z	SECTION S y-y
2.41	6.03cm⁴	9.14cm⁴	2.85cm³

Beam Loads

LENGTH L (mm)	ULTIMATE LOADS - LOAD 1: LOAD Fmax (KG)	ULTIMATE LOADS - LOAD 1: DEFLECTION Fmax (mm)	DESIGN LOADS: LOAD 1 F (KG)	DESIGN LOADS: LOAD 2 F (KG)	DESIGN LOADS: LOAD 3 F (KG)	DESIGN LOADS: LOAD 4 F (KG)
250	1597.0	0.3	*1597.0*	*798.5*	*598.9*	*399.2*
500	797.6	1.0	*797.6*	*398.8*	*299.1*	*199.4*
750	530.7	2.3	*530.7*	*265.3*	*199.0*	*132.7*
1000	396.9	4.0	*396.9*	*198.5*	*148.9*	99.2
1250	316.4	6.2	314.1	*158.2*	115.2	*79.1*
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1750	223.9	12.1	157.5	98.4	57.8	41.5
2000	194.8	15.7	119.0	74.4	43.6	31.3
2250	172.0	19.8	92.4	57.7	33.9	24.3
2500	153.6	24.2	73.1	45.7	26.8	19.3
2750	138.5	29.1	58.8	36.7	21.6	15.5
3000	125.8	34.3	47.7	29.8	17.5	12.6
3250	114.9	39.8	38.9	24.3	14.3	10.3

2. The vertical channels (columns)

Vertical channels are usually selected on practical considerations rather than for their column loads. For building services supports, applied loads that exceed channel column loads would be excessively large and not usually suited to a channel-based support system.

The load limitation for channel-based frames is usually the horizontal channels or the connections between the horizontal and vertical channels. However, where there are multiple tiers, significant loads, and taller columns typically 2m and above, check the accumulated loads do not exceed the channel column loads in the channel load data.

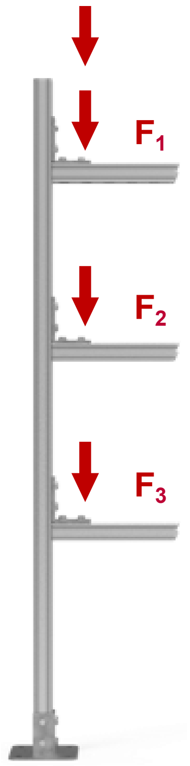
The following basic rules help guide the selection:

i) 41 x 21 channel profiles are not recommended for vertical channels (columns)

ii) For taller freestanding frames using back-to-back channel profiles gives extra rigidity to the frame even where single channel is adequate for the loads.

iii) Tip – for lightweight services, particularly on roof-tops, using back-to-back channel adds ballast to the installation.

Select the appropriate channel profile.



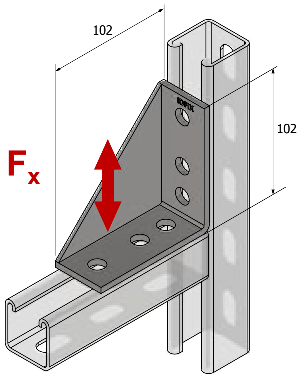
$F_1 + F_2 + F_3$

For column load checks apply the accumulated loads as a single load to the top of the column.

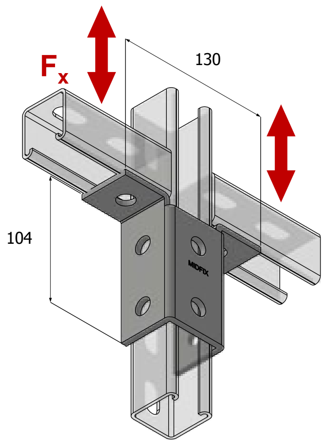
3. The channel-to-channel connections

Using the MX bracket pages select channel connections to suit the frame design. Using gusseted angle brackets and framing brackets will give greater rigidity to the frame, even if the connection loads are higher than required for the applied load.

Make a note of the maximum safe loads for the connections.



Gusseted Angle Bracket



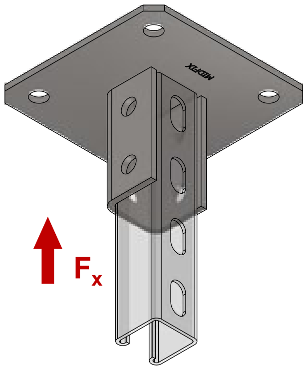
Framing Bracket example

4. The base plates

MX offers a choice of base plates for channel frames. Standard base plates are suitable for low level frames that have minimal leverage. Gusseted base plates extend up the leg of the frame and give additional bracing for taller frames. MX four-hole base plates are designed to give good stability in all directions and are load rated for fixing frames to ceilings.

For roof-top mounted frames it is normal practice to use rubber roof support feet to protect the roof membrane. Alternatively, steel base plates can be used and mounted on rubber pads.

Select the appropriate base plate. For trapeze type channel frames in overhead applications, use four-hole base plates and record the maximum safe load.



5. The connection to the substrate

For floor mounted frames not subject to leverage or lateral loads, the anchors should be adequate to support the frame during installation and prevent other unintentional movement. Concrete screws or Throughbolts of the appropriate diameter and embedment depth to suit the holes in the base plates are usually the best choice for concrete. Frames subject to lateral forces should always be referred to a competent design engineer.

For frames mounted overhead to concrete soffits, specifying the correct anchors is critical. With base plates there can be up to 4 anchors per plate making it important to ensure the minimum anchor spacings are observed.

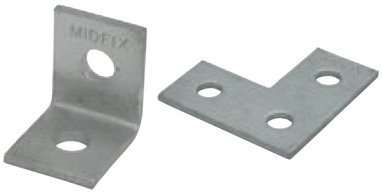
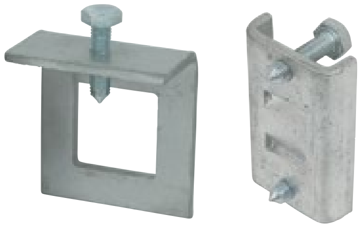
The permissible load for the anchors in the particular substrate must exceed the applied load from the support. Decide how many anchors are required to support the overall load and ensure the minimum spacing requirements for the anchors is achieved.

Make a note of the permissible load for the anchor combination.

Overall Safe Load for the Frame

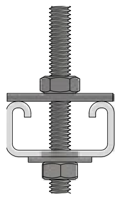
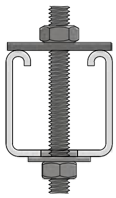
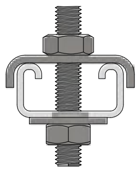
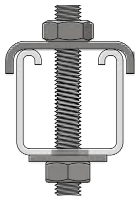
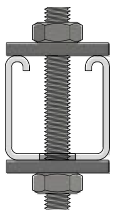
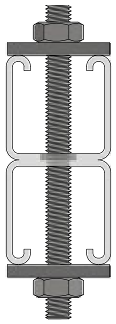
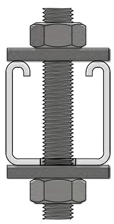
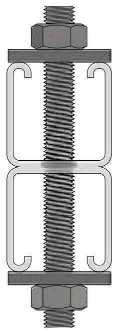
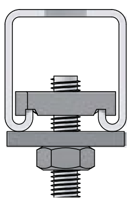
You now have the maximum safe loads for each element of your frame. The overall safe load for the support is whichever is the lowest value.

MX FASTENER SIZES & TORQUE SETTINGS TABLE

MX PRODUCT TYPES		FASTENERS	TORQUE SETTING
All MX Brackets		M10 DIN 933 Grade 8.8 Set Screws M10 DIN 125 Washers	**55Nm**
Beam Clamps (with conepoint screws)		M10 x 40 Conepoint Screws	**10Nm**
Beam Clamps (with nuts)		M10 Nuts	**20Nm**
Cantilever Arms (to channel)		M12 DIN 933 Grade 8.8 Set Screws M12 DIN 125 Washers	**60Nm**
Qwikstuds/Qwiknuts		M10	**12Nm**

Summary of information from the MX product pages

MX FASTENER SIZES & TORQUE SETTINGS TABLE

MX PRODUCT TYPES			FASTENERS	TORQUE SETTING
Trapeze Brackets (for components see pages 61-63)	 M8TBC1	 M8TBC2	M8 MX Threaded Rod M8 DIN 934 Class 8 Nuts	5Nm
	 M10TBC1	 M10TBC2	M10 MX Threaded Rod M10 DIN 934 Class 8 Nuts	10Nm
	 M10TBC3	 M10TBC4	M10 MX Threaded Rod M10 DIN 934 Class 8 Nuts	25Nm
	 M12TBC3	 M12TBC4	M12 MX Threaded Rod M12 DIN 934 Class 8 Nuts	25Nm
Header Rails (for components see page 64)			M8 MX Threaded Rod M8 DIN 934 Class 8 Nuts	10Nm
			M10/M12 MX Threaded Rod M10/M12 DIN 934 Class 8 Nuts	25Nm

Summary of information from the MX product pages

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