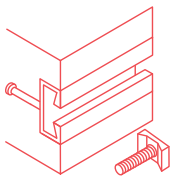


**Ancon**<sup>®</sup>

## **Ancon Channel, Bolts and Fixings**



**Anchoring & Fixing**  
**Cast-in Channels, T-Bolts & Accessories**

# Leviat®

A CRH COMPANY

We imagine, model and make engineered products and innovative construction solutions that help turn architectural visions into reality and enable our construction partners to build better, safer, stronger and faster.

**Leviat is a world leader in connecting, fixing, lifting and anchoring technology.**

From the build of new schools, hospitals, homes and infrastructure, to the repair and maintenance of heritage structures, our engineering skills are making a difference around the world.

We provide technical design assistance at every stage of a project, from initial planning to installation and beyond.

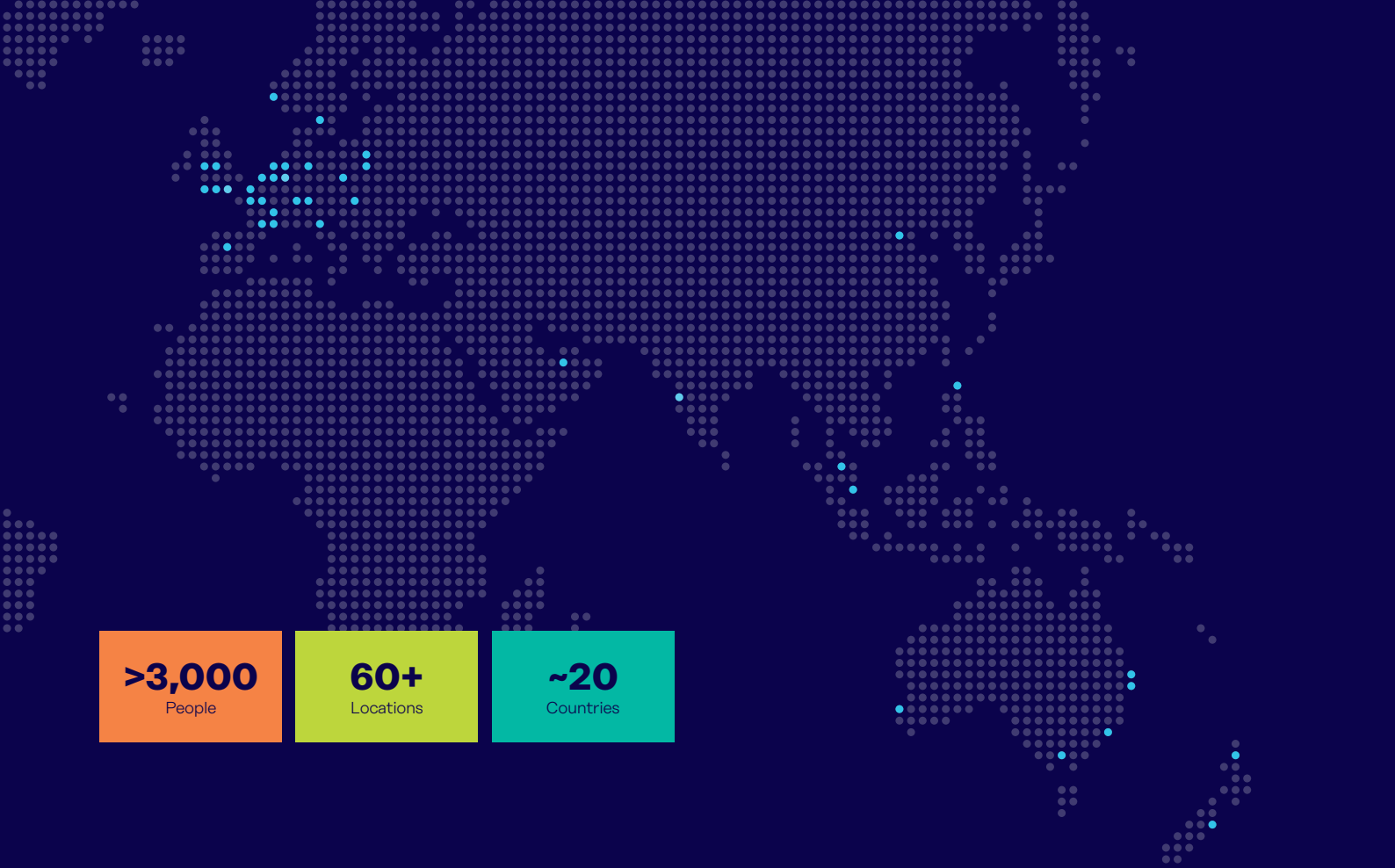
Our technical support services range from simple product selection through to the development of a fully customised project-specific design solution.

Every promise we make locally, has the commitment and dedication of our global team behind it. We employ almost 3,000 people at 60 locations across North America, Europe and Asia-Pacific, providing an agile and responsive service worldwide.

**Leviat, a CRH company, is part of the world's leading building materials business.**



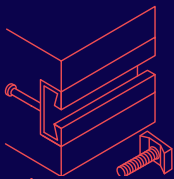




**>3,000**  
People

**60+**  
Locations

**~20**  
Countries

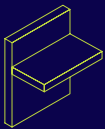


### Anchoring & Fixing

Systems for fixing secondary fixtures to concrete, including anchor channels, bolts and inserts; also tension rod systems for roofs and canopies.

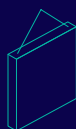
- Cast-in Channels, T-Bolts & Accessories
- Threaded Inserts
- Rod Systems
- Attachment Points
- Post Installed Anchor Systems

### Other areas of expertise:



#### Structural Connections

Systems to form robust, efficient connections, and continuity of concrete reinforcement as necessary, between walls, slabs, columns, beams and balconies, providing structural integrity as well as enhanced thermal and acoustic performance.



#### Lifting & Bracing

Systems for the safe and efficient transportation, lifting and temporary bracing of cast concrete elements and tilt-up panels before permanent structural connections are made.



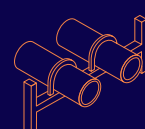
#### Façade Support & Restraint

Systems for the safe and thermally-efficient fixing of the external building envelope, including brick and natural stone, insulated sandwich panels, curtain walling and suspended concrete façades, and also the repair and strengthening of existing masonry installations.



#### Formwork & Site Accessories

Non-structural accessories that complement our engineered solutions and help keep your construction environment operating safely and efficiently, including moulds for casting standard and special concrete elements and construction essentials such as reinforcing bar spacers.



#### Industrial Technology

Mounting channels, pipe clamps and other versatile framing systems that provide safe fixing in a wide range of industrial applications.

### Leviat product ranges:

Ancon | Aschwanden | Connolly | Halfen | Helifix | Isedio | Meadow Burke | Modersohn | Moment | Plaka | Scaldex | Thermomass

# Ancon Channel, Bolts and Fixings

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## Building Information Modelling

BIM objects of Ancon products are now available to download from either [www.ancon.co.uk/BIM](http://www.ancon.co.uk/BIM) or NBS Source.



## Cast-in Channels

Cast-in Channels range from simple self-anchoring slots for accepting restraint fixings to large capacity channels with integral anchors (pages 9-10). They provide the necessary adjustment required when fixing to concrete and can eliminate site drilling. Nail holes aid the fixing of channels to timber formwork and an infill prevents the ingress of concrete during casting.

Cast-in fixings do not generate expansive forces in the concrete. They can therefore be used at close centres and can often be used closer to the edges than expansion fixings.

Ancon Cast-in Channels have been independently certified. The anchor shapes of Ancon Channels are outside current European Technical Assessment documents and therefore these products cannot be UKCA or CE marked.

## Ancon Omega

The Ancon Omega 21/18 Channel is a self-anchoring channel for use with Ancon Wall Ties referenced \_ \_21. The shallow depth of 18mm allows the channel to be used where there is reduced cover to the reinforcement. Nail holes aid the fixing of the channel to timber formwork.

## Ancon 30/20

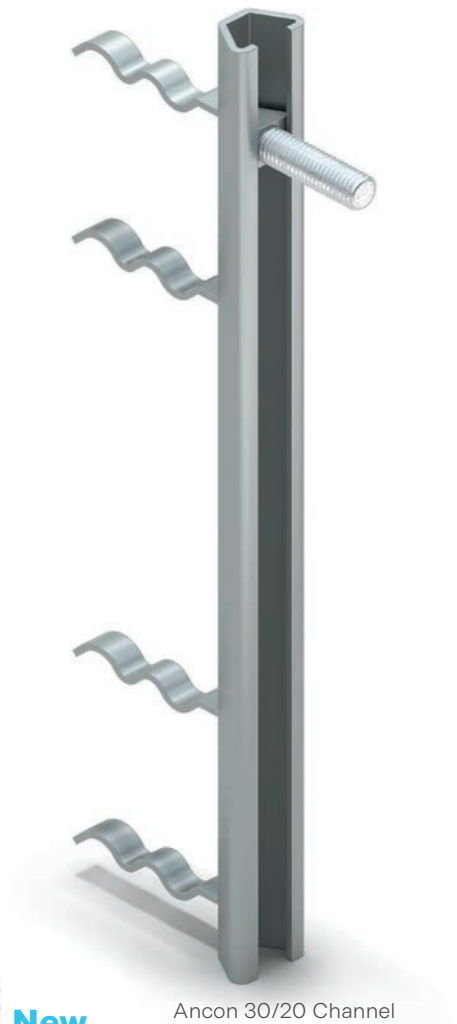
### Patent No: EP0882164B

Ancon 30/20 is a high performance channel. Its unique shape allows the applied load to be fed directly from the channel lips to the anchors and the more compact section size improves its fit between reinforcement. Specially designed T-head bolts ride up the sloping sides of the channel and securely lock behind the front lips. This channel also accepts standard 20mm wide wall ties. Ancon 30/20 is filled with continuously extruded closed-cell PE-LD foam. This material is removed easily in long sections and is 100% recyclable.

Ancon 30/20 should be used in preference to Ancon 38/17 channel as Ancon 30/20 is a high performance channel and its lower material content offers considerable cost benefits.

## Ancon 30/20 T-Head Bolt with Integrated Spring

Standard Ancon 30/20 M12 x 50mm T-head bolts are supplied with an integral spring fixed to the bolt head. The spring ensures the bolts are held firmly in the channel and prevents them from being dislodged, enabling quicker and easier installation of our masonry support systems.



Ancon 30/20 Channel



Ancon 30/20 T-Head Bolt with Intergrated Spring

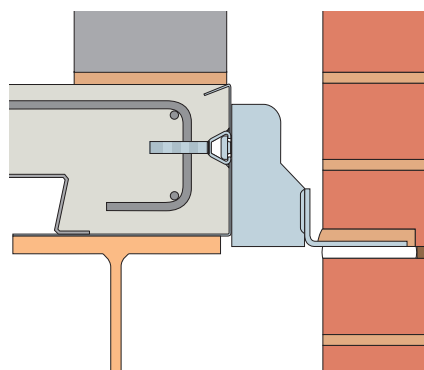
New



Ancon SD21 Channel Tie Fixed to Ancon Omega 21/18 Slot and Ancon MDC Support System Bolted to Ancon 30/20 Channel

**Ancon CombiDeck**

Ancon CombiDeck has been developed for use with the permanent metal deck shuttering of steel frame structures. Ancon CombiDeck edge support is supplied with an integral channel section, usually Ancon 30/20 Channel, built into the side to accept Ancon 'T' head bolts. More information on this product can be found in the Ancon Masonry Support Systems literature.



Ancon MDC Support System Fixed to Ancon CombiDeck Featuring Ancon 30/20 Channel



# Ancon Channel, Bolts and Fixings

## Surface-Fixed Channels

Plain-backed channels can be surface-fixed to steel, concrete and in some instances, masonry (page 12).

### Ancon 25/14

Ancon 25/14 Channel has been designed to tie a masonry leaf to steel, timber or concrete frames through a layer of insulation. The channel accepts Ancon Wall Ties referenced \_ \_ 25, typically SD25, and is fixed with either CFS+ or CFS concrete screws (page 19) or HTSS high-thread self-drilling screws (page 17). A compression sleeve around the fixings may be required. 25/14 channel features alternate 5.3mm and 9.5mm diameter holes to accommodate both fixing types and a 16mm opening to accept a drive socket. It can be cut to length on site.

## Bolt Fixings

### Expansion Bolts

High Performance Expansion Bolts (FAZ II Plus) suitable for cracked and uncracked concrete (Page 13).

### Bonded Anchors

These fixings create a strong chemical bond between the anchor and the host material. Resin is supplied in either ready-mixed capsules or mixed on application from a cartridge (page 14).

### Fixings for Steelwork

The Ancon Steelgrip simplifies the fixing of support systems to hollow steel sections where access is only available from one side (page 15). Stainless steel set screws and self-drilling screws are also available (page 16-17).

### Concrete Fixing Screws

CFS+ and CFS Concrete Fixing Screws are available to fix Ancon 25/14 concrete through a layer of insulation (page 19).

### Plug and Screw Fixings

Plug and screw fixings complete the range (page 18).

## Product Approvals & Certifications

### UKCA Marking

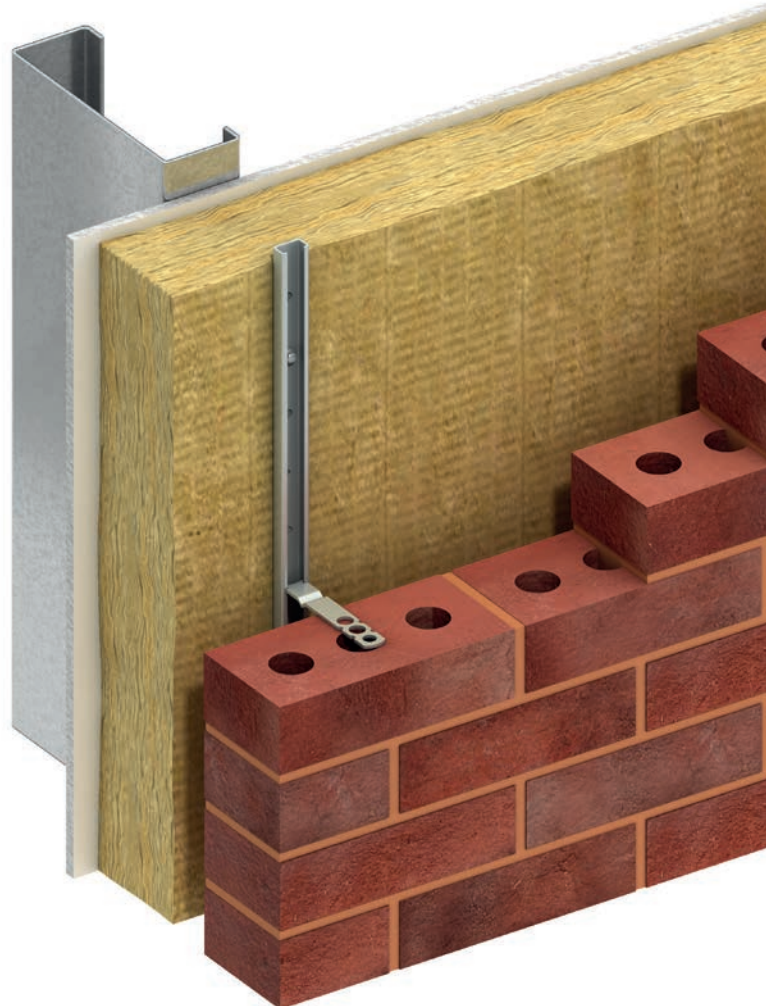
The UKCA (UK Conformity Assessed) marking is the new UK product marking that will be used for goods being placed on the market in Great Britain.

### CE UKNI Marking

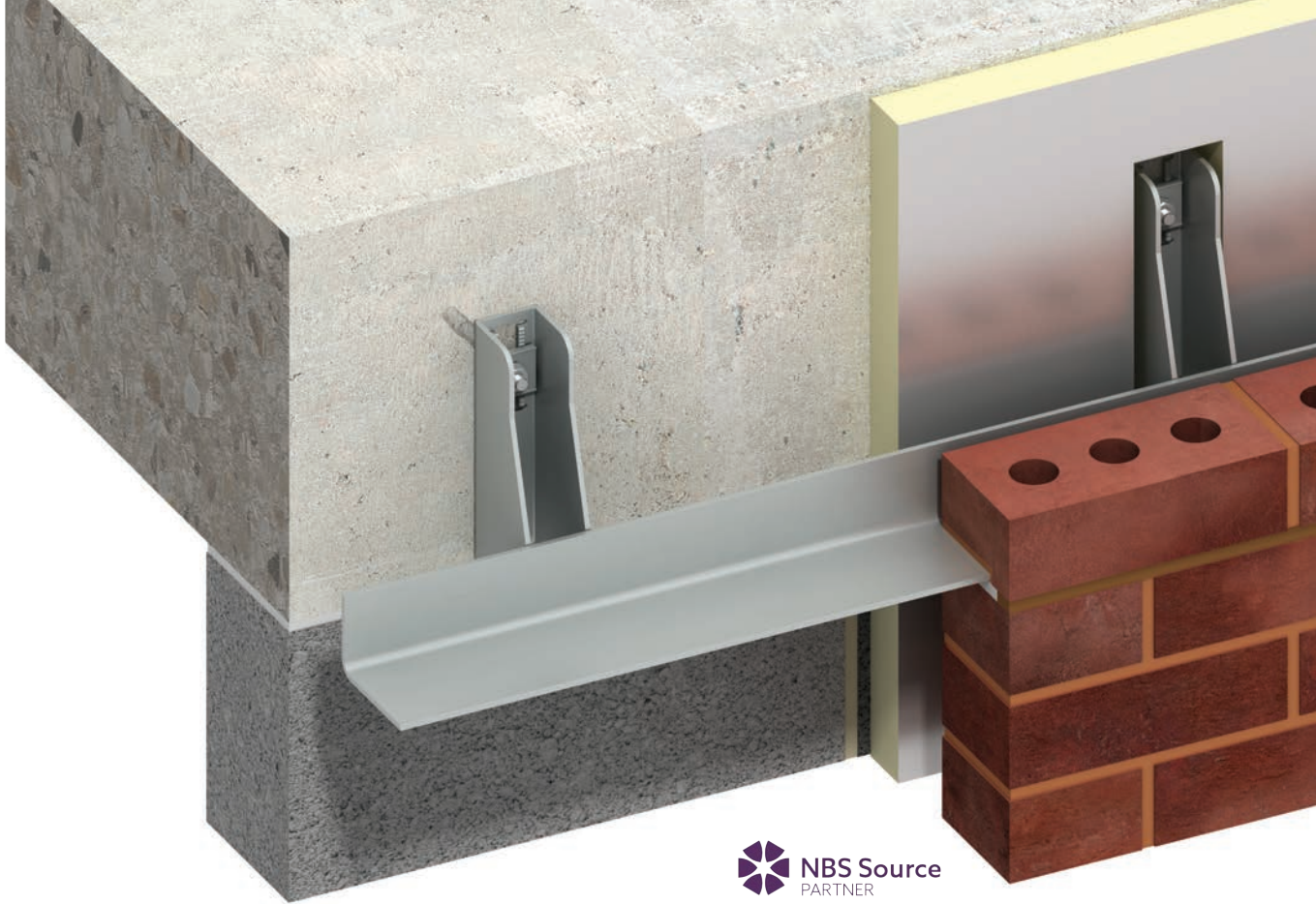
The UKNI marking is a new conformity marking for products placed on the market in Northern Ireland which will be used on products that have undergone mandatory third-party conformity assessment by a body based in the UK.

### CE Marking

For products used in Europe the existing CE mark will still remain. Our DoPs have been updated, please visit [www.ancon.co.uk/approvals](http://www.ancon.co.uk/approvals) for the latest versions.



Ancon 25/14 Channel System complete with Ancon SD25 Wall Tie and Self-Drilling Screw



Ancon MDC System Fixed to Concrete with High Performance Expansion Bolts

### Ancon Corner Guards

Ancon Corner Guards offer protection to exposed edges of columns and walls in areas of high traffic such as car parks, warehouses, hospitals etc. Leviat manufactures Ancon Corner Guards in a standard length of 1250mm in either stainless steel, galvanised steel or untreated mild steel. Stainless steel provides the greatest corrosion resistance and, where aesthetics are important, can be supplied with a satin-polished surface finish. Ancon Corner Guards can be either cast-in to concrete or post-fixed to almost any material. For more information please contact us.



Ancon Corner Guards

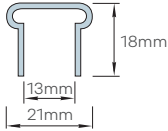


# Ancon Channel, Bolts and Fixings

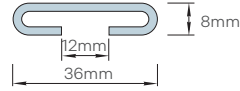
## Ancon Channel

Ancon Channels are produced in a range of profiles, as illustrated. Other profiles are available from the Halfen range of channels. Please contact Leviat for more information.

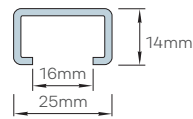
### 21/18 - Omega



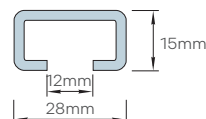
### 36/8



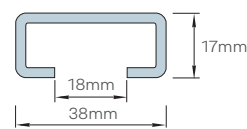
### 25/14



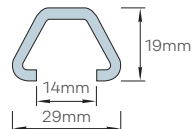
### 28/15



### 38/17\*/\*\*



### 30/20\*



\*\* only surface fixed versions



The table below shows channel lengths, availability and, where appropriate, the 'T' bolt required.

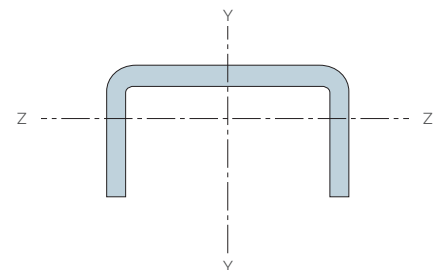
## Product Range

Channel Reference	Standard Bolts	Preferred 'T' Bolt Length (mm)	Tightening Torque (Nm)	Other Size Bolts	Preferred Lengths (mm)	Stainless Steel	
						304	316
21/18	-	-	-	-	100, 3000	✓	✗
36/8	-	-	-	-	1000, 2400, 3400	✓	✗
25/14	-	-	-	-	2700, 3000	✓	✓
28/15	M10	50, 80	20	-	100, 150, 3000	✓	✓
38/17*	M12	50, 100	30	M16 x 50	100, 150, 3000	✓	✓
30/20*	M12	50, 90	50	-	100, 150, 3000	✓	✗

**Notes:** The recommended tightening torque is for the standard bolts. \*Ancon 30/20 should be used in preference to Ancon 38/17 Channel. Ancon 30/20 is a high performance channel and its lower material content offers considerable cost benefits.

## Section Properties

Channel References	25/14	28/15	36/8	38/17
Mass (Kg/m)	0.51	1.08	0.63	1.73
Area (cm <sup>2</sup> )	0.64	1.36	0.79	2.19
I <sub>y</sub> (cm <sup>4</sup> )	0.60	1.37	1.13	3.93
I <sub>z</sub> (cm <sup>4</sup> )	0.16	0.38	0.09	0.74
W <sub>el,y</sub> (cm <sup>3</sup> )	0.48	0.98	0.63	2.07
W <sub>el,z</sub> (cm <sup>3</sup> )	0.17	0.43	0.16	0.74





## Cast-in Channels

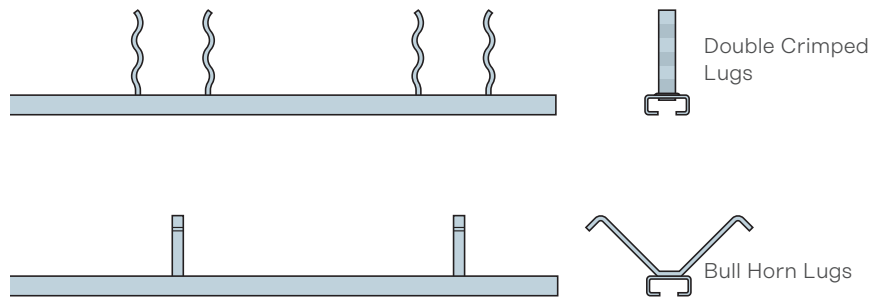
### Channel Lugs

Channels are supplied with integral double crimped lugs as standard. 'Bull Horn' lugs are welded at 90° to the line of the channel and can be specified as an alternative to the standard double crimped lugs.

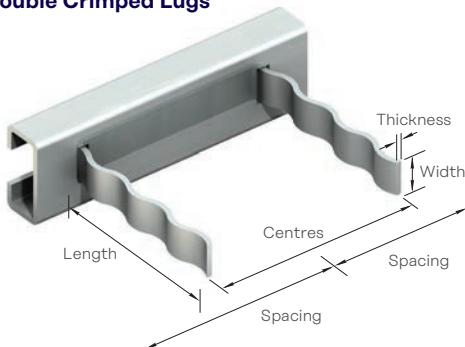
Ancon Cast-in Channels have been independently certified. The anchor shapes of Ancon Channels are outside current European Technical Assessment documents and therefore these products cannot be UKCA or CE marked.

### Channel Infill

All Ancon channels are supplied filled to help stop the ingress of concrete during casting. Ancon 28/15 and 30/20 are filled with continuously extruded closed-cell PE-LD foam. This material is removed easily in long sections and is 100% recyclable.

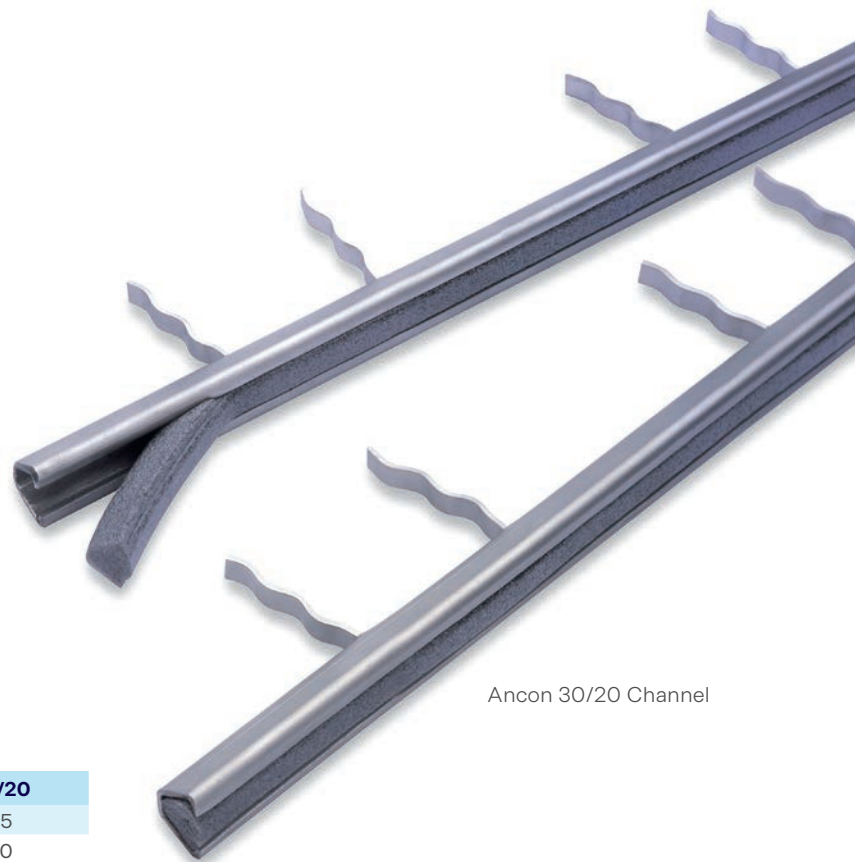


### Double Crimped Lugs



### Dimensions

Channel Ref	28/15	38/17	30/20
Length (mm)	65	65	65
Centres (mm)	70	70	70
Width (mm)	11	15	11
Thickness (mm)	2.5	2.5	2.5
Spacings (mm)	235	235	220

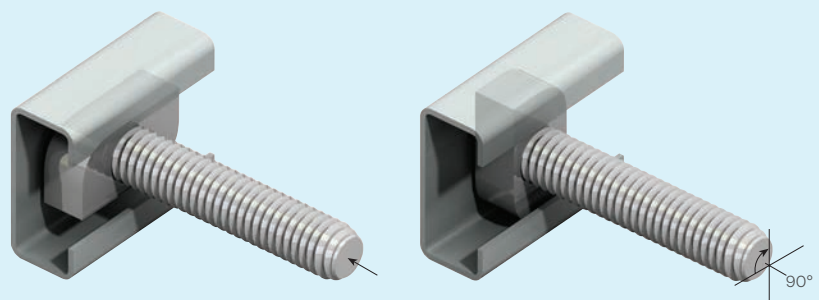


Ancon 30/20 Channel

### Fixing to Channels

Fixing to channels is by 'T' head bolts. These are inserted into the channel and turned through 90°. The bolt must then be tightened to the correct torque. Tapped plate washers can be used as an alternative to 'T' bolts where non-standard bolt lengths or diameters are required.

T-Head Bolts Inserted into Channel and Turned Through 90°

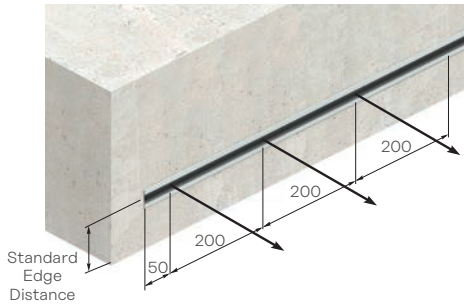


# Ancon Channel, Bolts and Fixings

## Design Resistances

The design resistances are based on channels with standard anchors (page 9), cast into concrete with a strength of C30/37.

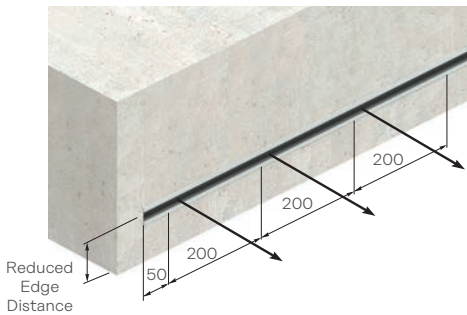
Longitudinal loads are achieved by friction using fully-tightened stainless steel or grade 4.6 bolts.



### Design Resistances at Standard Edge Distances

Channel Reference	Edge Distance (mm)	Tension (kN)	Shear (kN)	Longitudinal (kN)
28/15	50	5.8	5.8	1.4
38/17*	75	9.5	10.8	2.7
30/20*	75	10.1	10.8	2.7
30/20 CombiDeck	Top 55	8.8	9.5	2.7
	Bottom 75			

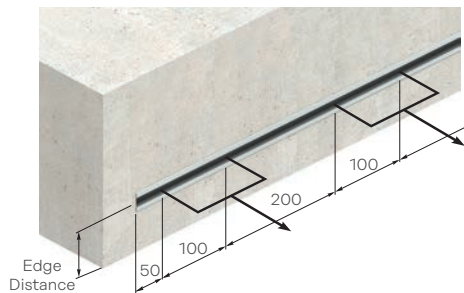
**Note:** The above values should be used in conjunction with the appropriate Eurocode safety factors.  $\gamma_G=1.35$   $\gamma_Q=1.5$



### Design Resistances at Reduced Edge Distances

Channel Reference	Edge Distance (mm)	Tension (kN)	Shear (kN)	Longitudinal (kN)
28/15	40	5.4	5.4	1.4
38/17*	60	6.8	8.1	2.7
30/20*	60	8.1	8.1	2.7

**Note:** The above values should be used in conjunction with the appropriate Eurocode safety factors.  $\gamma_G=1.35$   $\gamma_Q=1.5$

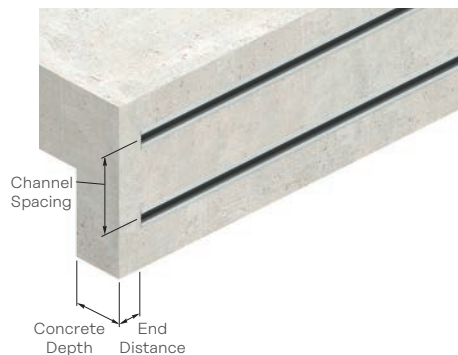


### Design Resistances Bolt Pairs

Channel Reference	Edge Distance (mm)	Tension (kN)	Shear (kN)
28/15	50	9.5	9.5
38/17*	75	12.2	12.2
30/20*	75	13.5	16.2

\*\* Longitudinal Load

**Note:** The above values should be used in conjunction with the appropriate Eurocode safety factors.  $\gamma_G=1.35$   $\gamma_Q=1.5$



### Minimum Channel Position Dimensions

Channel Reference	End Distance (mm)	Spacing (mm)	Concrete Depth (mm)
28/15	50	100	95
38/17*	50	150	95
30/20*	50	150	95

**Notes:** The design resistances shown in the tables above are for channels using the standard bolts. \*Ancon 30/20 should be used in preference to Ancon 38/17 Channel. Ancon 30/20 is a high performance channel and its lower material content offers considerable cost benefits.



### Design Example

#### Ancon Cast-in channel with combined tension and shear loads

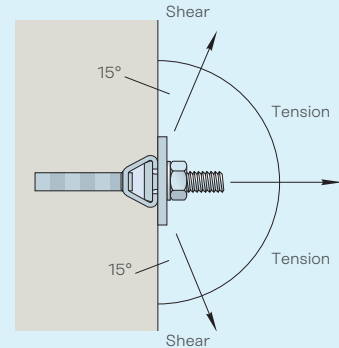
Design Action Tension	=	3.7kN	
Design Action Shear	=	4.2kN	
Design Resistance Tension	=	10.1kN	
Design Resistance Shear	=	10.8kN	
Resultant Action	=	$\sqrt{3.7^2 + 4.2^2}$	= 5.60kN
Angle	=	$\text{Tan}^{-1}x(3.7/4.2)$	= 41.38°

**Note:** Angle greater than 15° therefore compare Resultant Action with Design Resistance Tension.

Proof:

Design Action Tension	≤	Design Resistance Tension	OK
Design Action Shear	≤	Design Resistance Shear	OK
Resultant Action	≤	Design Resistance Tension	OK

Therefore use: Ancon 30/20 Cast-in Channel with Ancon M12 T-head Bolts.



## Installation Guidance

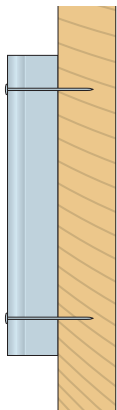
### Cast-in Channels

#### Fixing to Timber Formwork

Ancon Cast-in Channels are normally supplied in 3000mm lengths with welded anchors, nail holes, and infill. Incorrect installation is likely to result in expensive remedial work. All nail holes need to be utilised (except with Ancon Omega Channel), to prevent excessive ingress of concrete fines between the formwork and the channel during casting.

Both nail holes should be utilised when fixing Ancon 21/18 Omega Channel 100mm long to timber formwork. Longer lengths of this channel should be nailed at each end and then fixed at 300mm centres.

Nails with a plain shank should be installed perpendicular to the channel to ensure the easy removal of the formwork and the retention of the channel in the concrete.



Ancon Channel Nailed to Formwork

#### Fixing to Steel Formwork

Channels can be secured to steel formwork by using standard 'T' head bolts in pre-drilled holes. Where metal deck floors are being used, Ancon CombiDeck has a built-in channel and will replace the standard edge trim.

#### Welded Fabrications

Where channels with welded anchors are cut on site, it is important to ensure that there is a whole anchor within 50mm from the end of the channel.

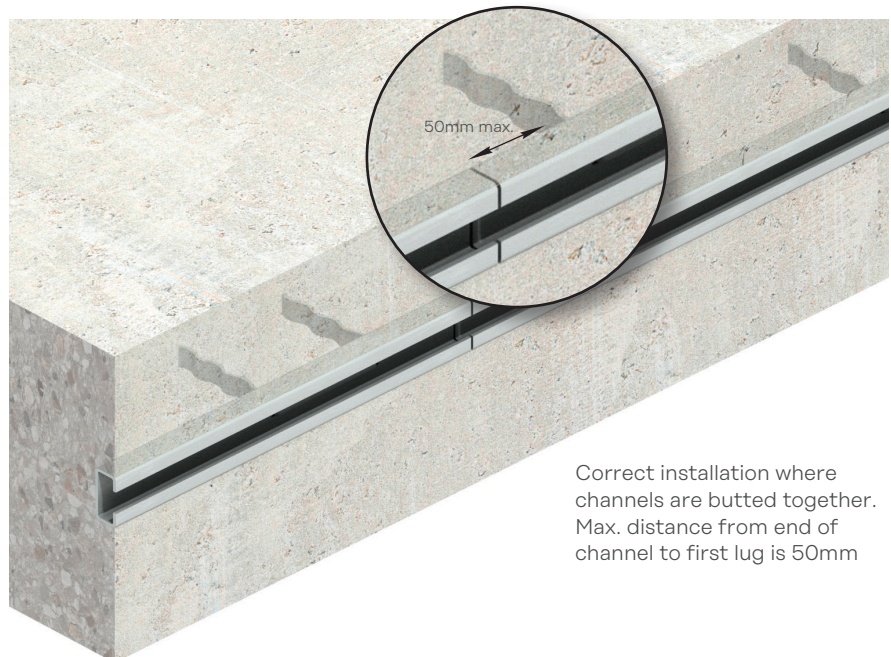
Where horizontal cast-in channel is used in conjunction with brickwork support systems, all external corners must incorporate a Welded Corner Fabrication. Release oil must not be applied to either the channel or the anchor.

#### Minimum Edge Distance

Care should be taken to ensure that the dimensions from the centre of the channel to the edges of the concrete are not less than the minimum edge distance shown on page 10. The channel must be lined and levelled correctly. In every situation, care must be taken to ensure a good fit is obtained between the face of the channel and the formwork.

#### Removal of Formwork

When the concrete is poured, care should be taken to ensure that it is fully compacted around the back of the channel and especially adjacent to anchors. After the concrete has cured and the formwork is removed, the nails should either be cut off or bent away from any tie or 'T' head bolt.



Correct installation where channels are butted together. Max. distance from end of channel to first lug is 50mm

# Ancon Channel, Bolts and Fixings



Surface-Fixed Channel with Welded Plate Bolted to Concrete

## Surface-Fixed Channels

Ancon Channels can be supplied with holes for surface fixing to concrete, steelwork and other materials. The design resistance will depend on the fixing centres, the type of fixing and the base material.

Ancon Channels are supplied plain-backed for surface fixing to either concrete or steelwork. When bolting channel to concrete or steelwork it is important to utilise all fixing holes (except with Ancon 25/14 channels), incorporating the square washer provided and ensuring its correct orientation to achieve the design resistances.

Bolt and washer specifications are shown below and bolts should be installed following the guides on pages 13 and 14.

## Bolt and Washer Specifications

Channel	Bolt Diameter	Washer
28/15	M8	25 x 25 x 3
38/17	M10	30 x 30 x 3



Surface-Fixed Channel Bolted to Concrete



Surface-Fixed Channel Fixed with a T-Head Bolt to Cast-in Channel

## Design Resistances

The design resistances for surface-fixed channels in the table below assume partial fixity ( $M=WL/6$ ) and are limited by either a maximum stress of  $240N/mm^2$  or a deflection of  $span/325$ .

Design resistances for other spans and/or different end fixity can be calculated using the section properties shown on page 8.

Surface-Fixed Channel References	Fixing Centres (mm)	28/15	38/17
Design Resistances (kN)	150	4.13	7.10
	200	3.10	5.33
	300	2.06	3.55
	450	1.38	2.37
	600	0.98	1.78

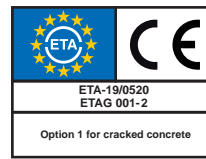


## Expansion Bolts

### FAZ II Plus High Performance Bolts

These are high performance throughbolts manufactured in grade A4 316 (1.4401 or 1.4571) stainless steel. They have double expansion clips that reduce axial and edge spacing and achieve high performance even in cracked concrete.

They fix into a hole which is similar to the diameter of the bolt. This allows the hole to be drilled through the hole in the item to be fixed.



FAZ II Plus Expansion Bolts should be specified in accordance with the design procedures described in ETAG001 Annex C: Design Methods for Anchorages. FAZ II Plus bolts carry a European Technical Approval (ETA-19/0520) and are suitable for use in cracked and non-cracked concrete within the strength class range of C20/25 to C50/60. Design resistances should be calculated for each individual application. For guidance on specific applications please contact Leviat.

Bolt Reference	FAZII Plus 6/10	FAZII Plus 8/10	FAZII Plus 10/10	FAZII Plus 10/30	FAZII Plus 12/30	FAZII Plus 12/50	FAZII Plus 16/25	FAZII Plus 16/50
Thread Size	M6	M8	M10	M10	M12	M12	M16	M16
Overall Length (mm)	65	75	95	115	130	150	148	173
Hole Dia. In Concrete (mm)	6	8	10	10	12	12	16	16
Drill Depth* (mm)	90	105	115	115	145	145	185	185
Hole Dia. In Fixture (mm)	7	9	12	12	14	14	17	17
Min. Embedment (mm)	55	55	75	75	85	85	105	105
Width Across Nut (mm)	10	13	17	17	19	19	24	24
Tightening Torque (Nm)	8	20	45	45	60	60	110	110
Max. Fixing Thickness (mm)	10	10	10	30	30	50	25	50

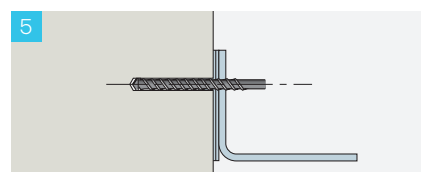
\*Minimum drill depth for throughbolt installation at maximum embedment. For further information for different embedments refer to ETA 19/0520.

### Before Installation

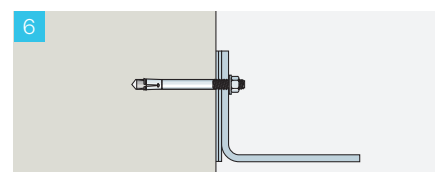
The following checks must be carried out prior to the installation of High Performance Bolts.

- 1 The appropriate length and diameter drill bit is used.
- 2 The correct edge distance and spacing are used in accordance with the design requirements.
- 3 The anchor/fixing is the correct size.
- 4 The correct setting tools are used.

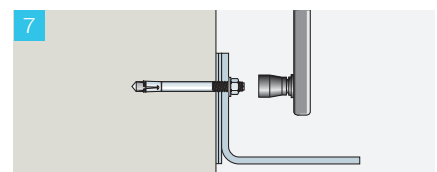
### Installation



Drill the hole using a hammer drill, through the pre-drilled hole in the fixture, into the concrete. This hole should be drilled perpendicular to the substrate surface, and to the correct diameter and depth. Either plunge the drill bit in and out of the hole three times or use a blow pump to remove any debris.



Insert the bolt through the component to be fixed and into the concrete. Add any packing shims that may be required.



Tighten bolt to the recommended torque.

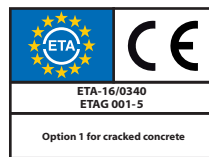
# Ancon Channel, Bolts and Fixings



## Bonded Anchors

### Capsule Anchors

The capsule contains styrene-free vinylester resin, quartz granules and a hardener, and provides an expansion-free anchorage for the stainless steel studs. These can be used in a variety of solid materials including concrete, stone and masonry. Resin options are available for cracked and non-cracked concrete.



Anchor Reference	FCS RG M8 x 110	FCS RG M10 x 130	FCS RG M12 x 160	FCS RG M16 x 190	FCS RG M20 x 260
Overall Length (mm)	110	130	160	190	260
Hole Dia. in Concrete (mm)	10	12	14	18	25
Drill Depth* (mm)	80	90	110	125	170
Hole Dia. in Fixture (mm)	9	12	14	18	22
Embedment* (mm)	80	90	110	125	170
Tightening Torque (Nm)	10	20	40	60	120
Max Fixing Thickness (mm)	10	16	21	32	52

\* Typical drill hole and embedment depths. For further information for different embedments refer to ETA 16/0340

### Injection Anchors

The cartridge contains a two-part system of vinylester resin and hardener which mixes in the nozzle during pumping. The general purpose resin can be used with most materials including concrete, blockwork and brickwork. Resin options are available for both cracked and non-cracked concrete.

For guidance on specific applications please contact Leviat.



Anchor Reference	FIS VL06/ FIS A M6 x 75	FIS VL08/ RG M8 x 110	FIS VL10/ RG M10 x 130	FIS VL12/ RG M12 x 160	FIS VL16/ RG M16 x 190	FIS VL/ RG M20 x 260
Overall Length (mm)	75	110	130	160	190	260
Hole Dia. in Concrete (mm)	8	10	12	14	18	24
Drill Depth* (mm)	66	90	106	131	127	222
Hole Dia. in Fixture (mm)	7	9	12	14	18	22
Embedment* (mm)	50	80	90	110	125	170
Tightening Torque (Nm)	5	10	20	40	60	120
Max Fixing Thickness (mm)	16	10	16	21	32	50

\* Typical drill hole and embedment depths. For further information for different embedments refer to ETA 10/0352

Bonded anchors should be specified in accordance with the design procedures described in EOTA Technical Report TR029: "Design of Bonded Anchors" or "BS EN 1992-4: 2018". Design resistance should be calculated for each individual application. For guidance on specific applications please contact Leviat.



## Fixings for Steel Frames

### Ancon Steelgrip

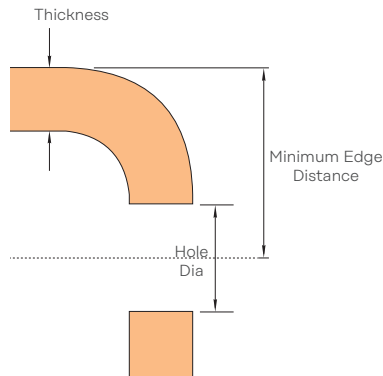
Ancon Steelgrip is a high performance fixing, which simplifies the fixing of masonry support systems to hollow steel sections, or other applications where access is only available from one side.

This bolt is only available for use with Ancon Systems. It features a serrated washer that corresponds with the serrations on all Ancon Brackets. The serrated surfaces interlock, and as the head is tightened to the correct torque the sleeve expands.

The Ancon Steelgrip consists of a zinc plated sleeve and cone, and a stainless steel screw and serrated washer.



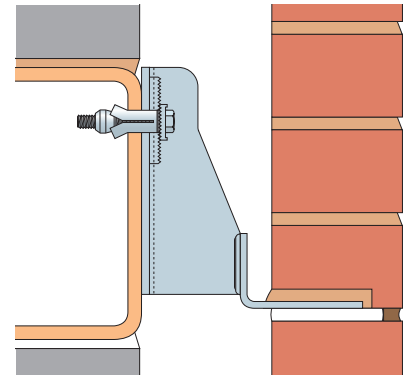
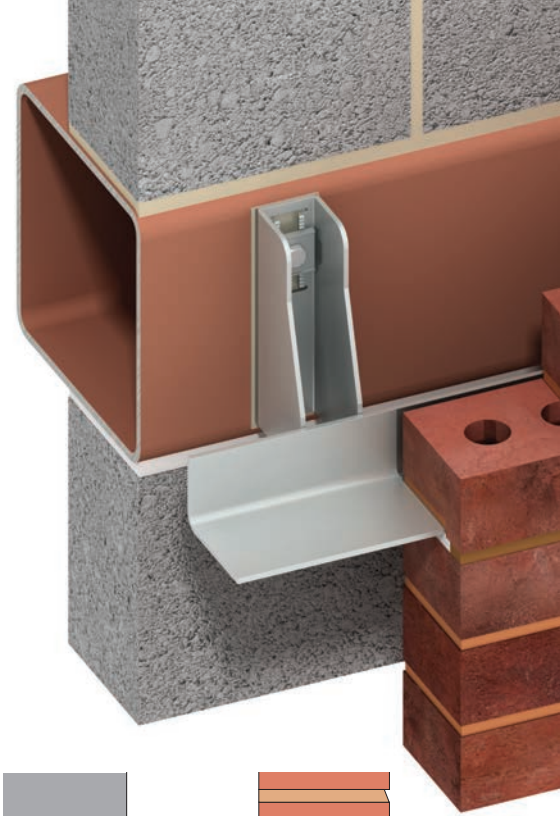
UK Patent No: 2410307



### Ancon Steelgrip 12 Min. Edge Distance (mm)

Thickness (mm)	6	8	10	12
Cold Rolled Sections	24	26	28	30
Hot Rolled Sections	24	30	35	46

**Note:** Minimum spacing 50mm



	Thread Size (mm)	Shim Allowance* (mm)	Overall Length (mm)	Resistance Tension (kN)	Resistance Shear (kN)	Steelwork Hole Dia. (mm)	Fixture Hole Dia. (mm)	Bolt Torque (Nm)
Ancon Steelgrip 12	M12	12	70	20.3	13.5	20	20	80

**Note:** Ancon Steelgrip is only for use with Ancon Systems.

\*Shim allowance varies depending on steel thickness and bracket type. For more information please contact Leviat.

### Design Guidance

The design resistances shown are static loads in either tension or shear, however in many applications the anchor will be subject to a combination of shear and tension. The combined actions must satisfy the following equation:

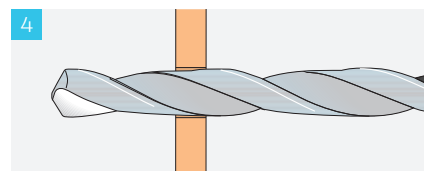
$$\frac{\text{Design Action Tension}}{1.4 \times \text{Design Resistance Tension}} + \frac{\text{Design Action Shear}}{\text{Design Resistance Shear}} \leq 1.0$$

### Before Installation

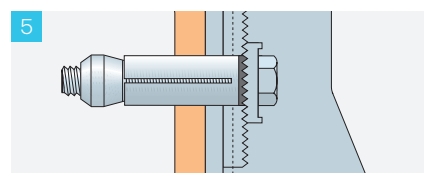
The following checks must be carried out prior to the installation of Ancon Steelgrip.

- 1 The appropriate diameter drill bit is used.
- 2 The correct edge distance is used in accordance with either the information in the table or that specified on drawings produced by Leviat.
- 3 The correct setting tool is used.

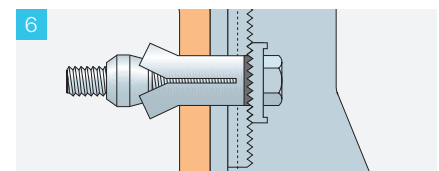
### Installation



Drill hole to correct size as stated.

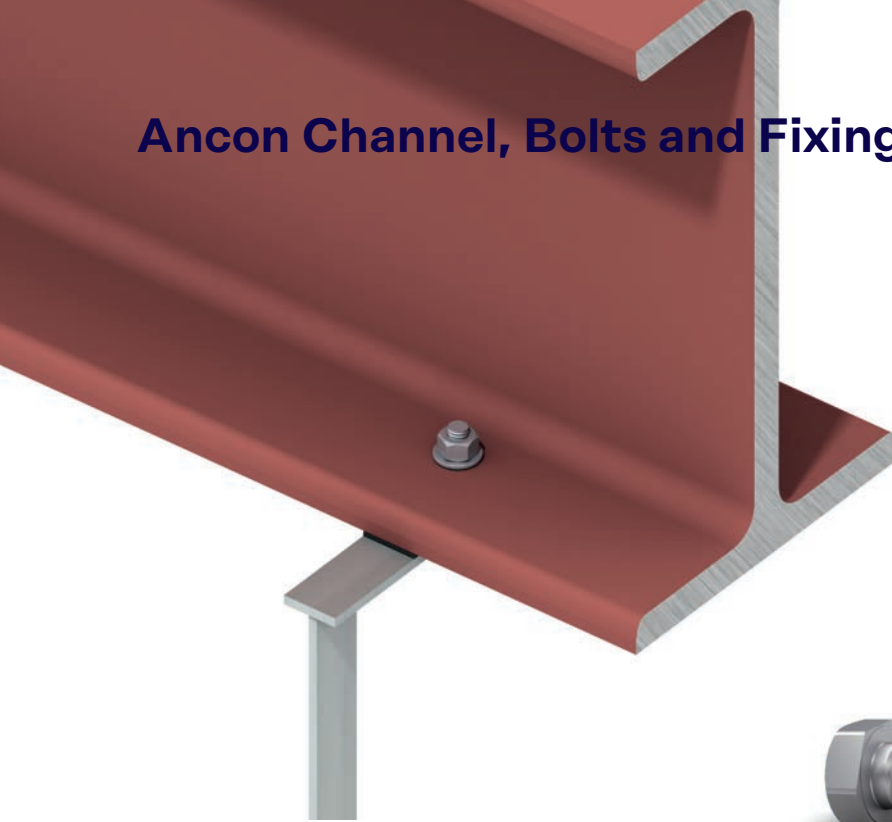


Insert the fixing through the fixture and into the pre-drilled hole ensuring the serrations are the correct orientation to interlock.



Begin to tighten with torque wrench. Adjustments to the line and level of the fixture can be made before the bolt has been fully tightened. Fully tighten to the recommended torque.

# Ancon Channel, Bolts and Fixings



## Set Screws

Ancon stainless steel set screws, nuts and washers are available in a range of thread sizes (M6 to M20) and are manufactured from grades A2 (1.4301) and A4 (1.4401) stainless steel, property class 70. Set screws can be shrink-wrapped and are supplied complete with nylon washers to prevent bi-metallic corrosion when fixing to steel.



Set Screw Reference	M6	M8	M10	M12	M16	M20
Area of Shank (mm <sup>2</sup> )	28	50	79	113	201	314
Area of Root Thread (mm <sup>2</sup> )	20	36	58	84	157	245
Resistance Tension (kN)	10.1	18.5	29.2	42.5	79.1	123.5
Resistance Shear (kN)	5.6	10.3	16.2	23.6	44.0	68.6
Tightening Torque (Nm)	6	14	27	48	120	230

## Design Guidance

The design resistances above have been calculated in accordance with BS EN 1993-1-8: 2005. The values given make no allowance for prying effects.

The design resistances shown are static loads in either tension or shear, however in many applications the anchor will be subject to a combination of shear and tension. The combined actions must satisfy the following equation:

$$\frac{\text{Design Action Tension}}{1.4 \times \text{Design Resistance Tension}} + \frac{\text{Design Action Shear}}{\text{Design Resistance Shear}} \leq 1.0$$

## Self-Drilling Screws

These screws feature a shaped drill tip of hardened steel that allows installation without pre-drilling. They should be fixed using a driver with a speed of around 1800rpm. Drive sockets are available.

High thread screws accommodate insulation between a surface-fixed channel and a steel frame. They are also suitable for fixing to timber - please contact Leviat for guidance regarding timber frame applications.



## Self-Drilling Screws

	Material Thickness	SDTSS-38-5PT	SDTCS-38-5PT-W	SDTSS-35-2PT	SDTSS-55-2PT
Screw Material		Stainless Steel*	Coated Steel	Stainless Steel*	Stainless Steel*
Diameter (mm)		5.5			
Length (mm)		38	38	35	55
Drilling Capacity (mm)		4.0-12.0	4.0-12.0	1.2-3.2	1.2-3.2
Resistance Tension (kN)	1.2mm	-	-	1.16	1.16
	1.4mm	-	-	1.54	1.54
	1.6mm	-	-	1.68	1.68
	1.8mm	-	-	2.09	2.09
	2.0mm	-	-	2.60	2.60
	2.5mm	-	-	3.52	3.52
	3.0mm	-	-	4.10	4.10
	4.0-12.0mm	6.45	8.84	-	-
Resistance Shear (kN)		3.75	4.70	3.75	3.75
Insulation/Material Thickness		0-10mm	0-13mm	0-16mm	0-30mm

\* Bi-metal - Austenitic stainless steel with carbon steel drill point



## High Thread Stainless Steel Screws

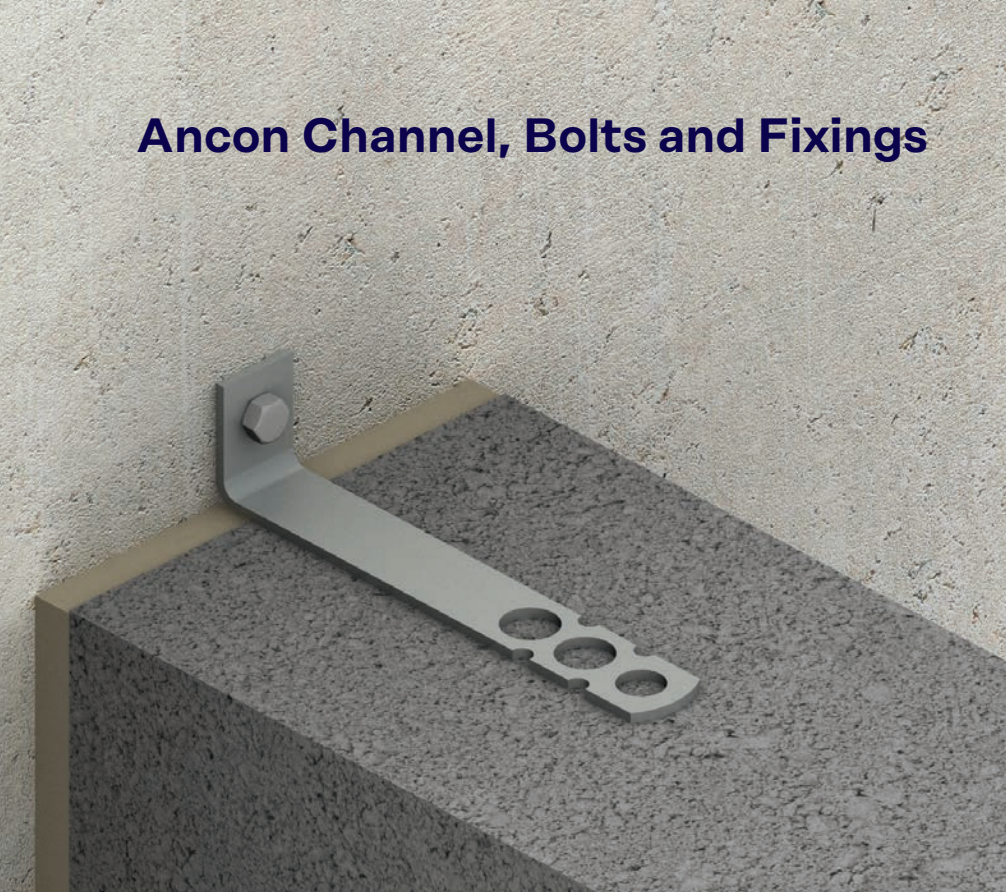
	Material Thickness	HTSS-65-2PT-W	HTSS-82-2PT-W	HTSS-100-2PT-W	HTSS-115-2PT-W	HTSS-135-2PT-W	HTSS-150-2PT-W	HTSS-180-2PT-W	HTSS-200-2PT-W	HTSS-240-2PT-W
Screw Material		Bi-metal - Austenitic stainless steel with carbon steel drill point								
Diameter (mm)		5.5								
Length (mm)		65	82	100	115	135	150	180	200	240
Drilling Capacity (mm)		1.2-3.2								
Resistance Tension (kN)	1.2mm	1.28								
	1.4mm	1.63								
	1.6mm	1.83								
	1.8mm	2.12								
	2.0mm	2.64								
	2.5mm	3.79								
	3.0mm	4.75								
Resistance Shear (kN)		3.75								
Insulation/Material Thickness (mm)		30-46	35-61	43-79	60-94	65-114	80-129	110-159	142-170	165-220
*Fixing Centres for 25/14 Channel (mm)		450	450	450	450	450	337.5	337.5	337.5	337.5

**Notes:** A factor of safety of 2 has been applied to ultimate values to determine a design resistance.

\*Fixing centres are those required to provide a Type 3 wall tie performance. See Ancon Wall Tie literature for more information. Contact Leviat for timber frame applications.



# Ancon Channel, Bolts and Fixings



## Plug and Screw Fixings

The DuoPower 8 x 40 plug is a two component plug suitable for fixing to brickwork, blockwork and both cracked and un-cracked concrete.

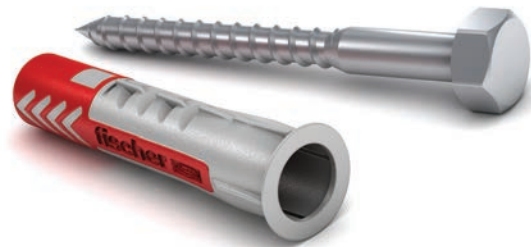
The Fischer DuoPower adjusts itself automatically to the building material and transfers the highest loads through the three product functions of folding, expanding and knotting.

It requires an 8mm diameter hole, 50mm deep into the substrate.

The fixing into the DuoPower plug is a stainless steel M6 x 50mm hex head coach screw.

The design resistance will depend on the substrate type.

Please contact Leviat for further information.



### CFS+ Concrete Fixing Screws

CFS+ screws allow Ancon 25/14 Channel to be fixed to concrete through a layer of insulation.

Screws are available to accommodate a total insulation thickness of between 50 and 270mm. Ancon CFS+ screws are specified simply based on the insulation thickness being used; a 'CFS+150' would be suitable for fixing 25/14 channel through 150mm thick insulation into a concrete inner leaf.

Regardless of CFS+ length, a diameter 6mm pilot hole, 55mm deep is required in the concrete. Ancon Compression Sleeves are not necessary when using any length of CFS+screw.

The Ancon CFS+ can be provided in either grade 1.4301 or 1.4401 (304 or 316) stainless steel and is capable of fixing into particularly strong (C50/60) concrete or concrete which has aged and hardened beyond its initial 28-day strength. As a result of its fully stainless steel build-up, it boasts superior durability and thermal performance.

More information, including wall tie and screw spacings, is available in the Ancon 25/14 Restraint System brochure.



### CFS Concrete Fixing Screws

CFS screws allow Ancon 25/14 Channel to be fixed to concrete through a layer of insulation.

Screws are available to accommodate a total insulation thickness of up to 270mm. A diameter 6mm pilot hole is required. An Ancon Compression Sleeve is required around the fixing, the same depth as the insulation. More information, including wall tie and screw spacings, is available in the Ancon 25/14 Restraint System brochure.



Insulation Thickness (mm)	CFS Reference	Screw Length (mm)	Recommended Pilot Hole Dia. x Depth (mm)
0	CFS060*	60	Ø6 x required embedment** +15
30-45	CFS100	100	
46-55	CFS110	110	
56-65	CFS120	120	
66-75	CFS130	130	
76-95	CFS150	150	
96-125	CFS180	180	
126-145	CFS200	200	
146-180	CFS212	212	
181-220	CFS252	252	
221-270	CFS302	302	

**Note:** Zinc plated carbon steel screws. Supplied with nylon shoulder washers. For use with Ancon stainless steel compression sleeves as part of the Ancon 25/14 Restraint System when fixing to concrete.

\* For fixing channel directly back to concrete where no insulation is present. Shoulder washer & compression sleeve not required, standard M8 nylon washer supplied to be used between screw and channel.

\*\*Required embedment depth can be calculated as follows: Screw Length - Insulation Thickness.



# Ancon Channel, Bolts and Fixings

## Applications



Student Centre,  
LSE, London, UK



Deutsche Bank  
Sydney NSW, Australia



Magistrates Court  
Mansfield, UK



Retail Development  
Buchanan Galleries, Glasgow, UK

## Other Ancon Products

### Wall Ties and Restraint Fixings

Leviat manufactures Ancon ties in a variety of lengths and types for restraining brickwork, blockwork and stonework. These ties can be fixed to concrete and structural steelwork, as well as any type of masonry.



### Masonry Support Systems

Masonry cladding on concrete or steel framed buildings is normally supported by stainless steel masonry support systems. We have developed the most comprehensive range of stainless steel support systems and restraints. Products include Ancon Optima, a standard system available from stock. A full design and drawing service accompanies our bespoke support systems.



### Tension Systems

The use of tie bars in structures and buildings both as an architectural and a structural element is increasing. Ancon Tension Systems comprise a range of components which can be supplied in carbon steel or stainless steel in a variety of sizes and finishes. The system looks particularly impressive when used with large areas of glazing or timber trusses.



### Shear Load Connectors

Ancon DSD and ESD Shear Load Connectors are used to transfer shear across expansion and contraction joints in concrete. They are more effective than standard dowels at transferring load and allowing movement to take place, and can be used to eliminate double columns at structural movement joints in buildings.



### Punching Shear Reinforcement

Used within a slab to provide additional reinforcement around columns, Ancon Shearfix is the ideal solution to the design and construction problems associated with punching shear. The system consists of double-headed studs welded to flat rails, positioned around the column head. The shear load from the slab is transferred through the studs into the column.



### Reinforcing Bar Couplers

The use of reinforcing bar couplers can provide significant advantages over lapped joints. Design and construction of the concrete can be simplified and the amount of reinforcement required can be reduced. The Ancon range includes threaded and mechanically bolted couplers.







**Leviat<sup>®</sup>**  
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