

Ancon

Installation Guide

Ancon 25/14 Restraint System

For restraining brickwork back to in-situ structures through an insulation layer.

The Ancon 25/14 Restraint System is designed to tie brickwork back to steel (typically SFS), concrete or timber frames. Screws fix through the channel and an insulation layer and into the substrate.

Ancon 25/14 Channel is available in lengths of 2700mm and 3000mm and can be cut to length on site as required. To allow for thermal movement, 25/14 channel should be installed with 10mm gaps between each separate piece of channel.

To ensure a fixing position is always located near the end, Ancon 25/14 Channel features alternating 5.3mm and 9.5mm diameter fixing holes at close centres. The smaller 5.3mm diameter holes should be used with Ancon High-Thread Screws for fixing to steel or timber. The larger 9.5mm diameter holes should be used with Ancon CFS+ and CFS Screws when fixing to concrete.

Important – Using the incorrect hole and fixing screw combination invalidates the system performance.



Fixing Ancon 25/14 Channel to Steel

Ancon 25/14 Restraint System – Fixing to Steel

The Ancon 25/14 Restraint System can be fixed to a light steel frame through any type of insulation using Ancon 'HTSS' High-Thread Self-Drilling Screws. High-Thread Screws are available to accommodate a combined backing board and insulation thickness of up to 220mm and a steel thickness from 1.2mm to 3mm.

Ancon High-Thread Screws feature a shaped drill tip of hardened steel to allow installation without pre-drilling. **They should be installed using a variable speed screwdriver** (rather than impact driver) set to a drive speed of around **1800rpm**. An SDS drive system to suit an 8mm (5/16") hexagon socket is required. The channel section has a 16mm opening to accommodate the socket within the channel during installation.

It should be noted that the self-drilling capacity of the screws can be reduced if they are used to drill through a layer of cement particle board before reaching the steel frame. For optimal screw self-drilling performance, the cement particle board should be drilled in advance.

To install Ancon 25/14 Channel, Ancon High-Thread Screws should be fixed through the channel and the insulation and into the steel frame. The screws can be installed directly through any thickness of rigid insulation (up to 220mm) or directly through any of the following insulation products with a maximum thickness of 180mm:

- Isover Polterm Max Plus
- Kingspan Facades K-Roc Rainscreen Slab
- KlasseROCK[®] Rainscreen Insulation
- Knauf Insulation Rocksilk[®] Rainscreen Slab
- ROCKWOOL Nyrock® Rainscreen 032
- ROCKWOOL Rainscreen Duo Slab[®]
- Unilin Insulation Stonewool SW/RS

When using other thicknesses of these insulations or other semirigid/flexible insulations, **Ancon Compression Sleeves** (the same depth as the insulation) must be used around the fixing screws to provide the necessary support.

When installing fixings in combination with compression sleeves, rotate the fixing only until it is tight. Further rotations may strip the thread and invalidate the performance of the system.

Important – Ancon High-Thread Screws must be used with the smaller 5.3mm diameter holes in Ancon 25/14 Channel. Failure to do so invalidates the system performance.

When installing 25/14 channel, 10mm gaps should be left between each length to allow for thermal movement.





Ancon Compression Sleeves may be required around the fixing screws with some insulations

Fixing Ancon 25/14 Channel to Steel

High Thread Stainless Steel screws fixing into lightweight metal sections, typically SFS

Screw Reference	Steel 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
Material				Bi-metal - A	ustenitic sta	nless steel wit	th carbon ste	el drill point		
Diameter (mm)						5.5				
Length (mm)		65	82	100	115	135	150	180	200	240
Drilling Capacit (mm)	У					1.2 - 3.0				
	1.2mm					1.28				
	1.4mm					1.63				
Design	1.6mm					1.83				
Resistance	1.8mm					2.12				
Tension (kN)	2.0mm					2.64				
	2.5mm					3.79				
	3.0mm					4.75				
Design Resistance Shear (kN)						3.75				
Insulation/ Bacl Material Thickn	king ess (mm)	30-46	35-61	43-79	60-94	65-114	80-129	110-159	142-170	165-220

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

Vertical Screw Centres for Ancon 25/14 Channel – Fixed to Steel

Тіе Туре	Vertical Screw Spacing (mm)
1	225
2	337.5
3	337.5 / 450*
4	337.5 / 450*

Note: For information on Tie Types please refer to page 10.

*337.5mm centres for insulation thicknesses greater than 114mm.



Ancon 25/14 Restraint System fixed to lightweight steel frame through rigid insulation - Typical detail.

Note: Compression sleeves (not shown) may be required for some insulation types - please see above for details.

For Wall Tie installation guidance and details please refer to page 9.

Fixing Ancon 25/14 Channel to Timber

Ancon 25/14 Restraint System – Fixing to Timber

The Ancon 25/14 Restraint System can be fixed to a timber frame through any type of insulation using Ancon 'HTSS' High-Thread Self-Drilling Screws. High-Thread Screws are available to accommodate a total insulation thickness of up to 186mm.

Ancon High-Thread Screws feature a shaped drill tip of hardened steel to allow installation without pre-drilling. **They should be installed using a variable speed screwdriver** (rather than impact driver) set to a drive speed of around **1800rpm**. An SDS drive system to suit an 8mm (5/16") hexagon socket is required. The channel section has a 16mm opening to accommodate the socket within the channel during installation.

To install Ancon 25/14 Channel, Ancon High-Thread Screws should be fixed through the channel and the insulation and into the timber frame. The screws can be installed directly through any thickness of rigid insulation (up to 186mm) or directly through any of the following insulation products with a maximum thickness of 180mm:

High-Thread Stainless Steel Screws fixing into Timber (Min. C16)

- Isover Polterm Max Plus
- Kingspan Facades K-Roc Rainscreen Slab
- KlasseROCK[®] Rainscreen Insulation
- Knauf Insulation Rocksilk[®] Rainscreen Slab
- ROCKWOOL Nyrock® Rainscreen 032
- ROCKWOOL Rainscreen Duo Slab[®]
- Unilin Insulation Stonewool SW/RS

When using other thicknesses of these insulations or other semirigid/flexible insulations, **Ancon Compression Sleeves** (the same depth as the insulation) must be used around the fixing screws to provide the necessary support.

Important – Ancon High-Thread Screws must be used with the smaller 5.3mm diameter holes in Ancon 25/14 Channel. Failure to do so invalidates the system performance.

When installing 25/14 channel, 10mm gaps should be left between each length to allow for thermal movement and shrinkage of the frame.

Screw Reference	HTSS-100- 2PT-W	HTSS-115- 2PT-W	HTSS-135- 2PT-W	HTSS-150- 2PT-W	HTSS-180- 2PT-W	HTSS-240- 2PT-W	
Material	Bi-metal - Austenitic stainless steel with carbon steel drill point						
Diameter (mm)			.5				
Length (mm)	100	115	135	150	180	240	
Minimum Embedment (mm)	bedment (mm) 50						
Design Resistance Tension (kN)	1.54						
Design Resistance Shear (kN)	3.75						
Max. Insulation/Backing Material Thickness (mm)	46	61	81	96	126	186	

Note: A factor of safety of 2 has been applied to the ultimate values to determine a design resistance. Minimum insulation/ backing material thickness is dependent on the timber thickness. Minimum = Screw length – Timber thickness. If the timber thickness is greater than the screw length then the minimum is zero.

Vertical Screw Centres for Ancon 25/14 Channel – Fixed to Timber

Vertical Screw Spacing (mm)
225
337.5
337.5 / 450*
337.5 / 450*

Note: For information on Tie Types please refer to page 10. *337.5mm centres for insulation thicknesses greater than 114mm.

For Wall Tie installation guidance and details please refer to page 9.

Fixing Ancon 25/14 Channel to Concrete

Ancon 25/14 Restraint System – Fixing to Concrete

The Ancon 25/14 Restraint System can be fixed to a concrete frame through any type of insulation using either the Ancon CFS+ or Ancon CFS Concrete Fixing Screws. Both screws are available in lengths to accommodate insulation up to 270mm thick

Note: Concrete strength, aggregate type and aggregate size are important factors to consider when installing concrete screws. For grades up to C35/45, the Ancon CFS can be used. For stronger grades, up to C50/60, we recommend the CFS+. Concrete strength increases with age and care should be taken when installing screws into older concrete as the strength may have increased beyond the working range of the fixing. For further advice, please contact Leviat.

Ancon CFS+

The Ancon CFS+ has been specifically designed for use with Ancon 25/14 Channel. The ETA approved concrete screw end provides exceptional performance, even in hard concrete, and the fixing itself is delivered to site fully assembled to enable quick and simple installation. The CFS+ can be used with all insulation types and an Ancon Compression Sleeve is not required.

Installation should follow the below process:

- Set a mark/ tape on a PGM approved SDS drill bit to achieve a drill hole depth of 55mm. E.g. when drilling through 250mm thick insulation, the mark would be set at 305mm.
- Using the 25/14 channel as a guide, mark the precise position of the pilot holes at the required spacing (see following tables for details). Note that the larger holes in the channel (Ø9.5mm) must be used with CFS+.
- Remove the channel and drill pilot holes Ø6mm x 55mm deep through the insulation and into the concrete.
- Plunge the drill in and out 5-6 times to clear the hole of debris.
- If drill bit shows signs of wear, replace immediately to ensure subsequent holes are of the correct diameter and depth.
- Use a variable speed impact driver with a maximum rating of 160Nm and a SW13 nut setter to gently ease the screw thread in on half speed.
- Once embedded approximately halfway, adjust the impact driver to full speed and drive the screw in. The tone of the impact driver will indicate when the screw is correctly set.
- Offer the channel up to the installed fixings and secure in place through the Ø9.5mm pre-punched holes using the supplied button-head setscrews. The setscrews should be fastened through the channel into the extended nut on the end of the CFS+ fixing using a tightening torque of 10Nm. To reduce the risk of cross-threading, we recommend the setscrew is started off by hand using a hex key.

Important - Ancon CFS+ Fixing Screws must be used with the larger 9.5mm diameter holes in Ancon 25/14 Channel. Failure to do so invalidates the system performance.

Ancon CES+ Screw





Fixing Ancon 25/14 Channel to Concrete

When installing 25/14 channel, 10mm gaps should be left between each length to allow for thermal movement. Suitable PGM approved drill bits, impact drivers and drive sockets can be supplied – please contact us for more information.

Ancon CFS+ Screws fixing into Concrete

Screw Reference	CFS+
Material Options	1.4301 or 1.4401 stainless steel
Shank Diameter	M8
Screw Length	To suit project specific insulation thickness (50 - 270mm)
Pilot Hole Size (mm)	Ø6 x55
Insulation / Material Thickness (mm)	50 - 270

Vertical Screw Centres for Ancon 25/14 Channel – Fixed to Concrete using CFS+

Тіе Туре	Vertical Screw Spacing (mm)
1	225
2	337.5
3	337.5 / 450*
4	337.5 / 450*

Note: For information on Tie Types please refer to page 10. *337.5mm centres for insulation thicknesses greater than 114mm.



Ancon 25/14 Restraint System fixed to concrete using Ancon CFS+ Screw - Typical detail.

For Wall Tie installation guidance and details please refer to page 9.

On-site installation training is available for the CFS+ via our partners at Certifix, who also offer a CFS+ pull testing service to BS 8539:2012, supported by a site test report complete with recommendations and bespoke proposed installation methodology.

Please contact us for prices and more information.

Fixing Ancon 25/14 Channel to Concrete

Ancon CFS

Ancon 25/14 Channel is supplied with pre-punched Ø9.5mm holes to accept Ancon CFS Screws. These fixings must be used in combination with Ancon Compression Sleeves, supplied in the same length as the insulation thickness being used. Ancon CFS Screws are not recommended for use with concrete grades greater than C35/45 - please refer to the Ancon CFS+ instead.

Installation should follow the below process:

- Using the 25/14 channel as a guide, mark the precise position of the pilot holes at the required spacing (see following tables for details). Note that the larger holes in the channel (Ø9.5mm) must be used with CFS.
- Remove the channel and drill Ø6mm pilot holes to the required depth (see following tables for dimensions).
- Plunge the drill in and out 5 6 times to clear the hole of debris.
- Push an Ancon Compression Sleeve, the same depth as the insulation, through the insulation at each fixing location.
- Ensure the supplied shoulder washer is in place and fix the channel into position by using a TX30 driver bit. The CFS Screw should pass through the channel, compression sleeve and insulation and fix into the concrete.

Note: For embedments up to 30mm, a standard electric screwdriver can be used. For embedment depths greater than 30mm or for concrete grades above C30/37, a small impact driver may be necessary. Installation should begin on a low torque setting and be increased as required up to a maximum of 150Nm. Torque settings in excess of 150Nm may cause damage to the fixing.

Important – Ancon CFS Fixing Screws must be used with the larger 9.5mm diameter holes in Ancon 25/14 Channel. Failure to do so invalidates the system performance.





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Fixing Ancon 25/14 Channel to Concrete

CFS Screws for fixing into Concrete (min C20/25)

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

Note: *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 can be calculated as follows: Screw Length - Insulation Thickness.

Vertical Screw Centres for Ancon 25/14 Channel – Fixed to Concrete using CFS

Тіе Туре	Vertical Screw Spacing (mm)
1	225
2	337.5
3	337.5 / 450*
4	337.5 / 450*

Note: For information on Tie Types please refer to page 10. *337.5mm centres for insulation thicknesses greater than 114mm.



Ancon 25/14 Restraint System fixed to concrete using Ancon CFS Screw - Typical detail.

For Wall Tie installation guidance and details please refer to page 9.

Ancon 25/14 Channel – Wall Tie Installation

Installing the wall ties

The installation process for wall ties with the Ancon 25/14 Restraint System is the same regardless of the substrate being used. Ancon _ _ 25 wall ties can be inserted at any point in the channel and easily positioned to provide the required vertical centres.

SD25 or Teplo-BF-CT 25 wall ties should have a minimum embedment of 55mm in the outer leaf and should be fitted such that the drip part of the tie (where present) is pointing downwards. Ties should be installed level or with a slight fall to the outer leaf, not towards the inner leaf as this could provide a path for moisture to cross the cavity.

When installing wall ties close to the end of a length of channel, ties should be located at a maximum of 50mm from the last fixing and no closer than 25mm to the end of the channel.

Wall ties should be pressed down in, and surrounded by, fresh mortar. Installed ties should be clear of mortar droppings.

Recommended Wall Tie Vertical Spacing with Ancon 25/14 Channel at 600mm Horizontal Centres

Тіе Туре	Vertical Tie Spacing (mm)
1	300*
2	450
3	450
4	450

Notes: Centres shown achieve equivalent tie type performances to PD 6697 6.2.2.5 Table 12 (M2 Mortar).

*225mm vertical tie spacing for Teplo-Channel Ties 300mm and longer.

Open Cavity	Tie Length	Ancon Tie	References
(mm)	(mm)	SD25	Teplo-BF-CT 25
35-59	100	SD25/100	-
60-84	125	SD25/125	-
85-109	150	SD25/150	Teplo-BF-CT - 150
110-134	175	SD25/175	Teplo-BF-CT - 175
135-159	200	SD25/200	Teplo-BF-CT - 200
160-184	225	SD25/225	Teplo-BF-CT - 225
185-209	250	SD25/250	Teplo-BF-CT - 250
210-234	275	SD25/275	Teplo-BF-CT - 275
235-259	300	SD25/300	Teplo-BF-CT - 300
260-284	325	-	Teplo-BF-CT - 325
285-309	350	-	Teplo-BF-CT - 350
310-334	375	-	Teplo-BF-CT - 375

Typical Layout of Wall Ties Indicating Maximum Spacing



Ancon SD25 Tie & 25/14 Channel

25/14 Channel will accept all Ancon ties referenced _ _ 25.





Typical spacing for wall ties using Ancon 25/14 Restraint System. Actual wall ties spacing will depend on Tie Type performance required please refer to the Recommended Wall Tie spacing tables on the following pages. Refer to PD 6697:2019 for complete information on wall tie positioning.

Ancon 25/14 Channel – Summary Table

Required Wall Tie Type	Application	Maximum Building Height (m)	Geographical Location
Type 1	Heavy duty tie, suitable for most building types	Any height	Suitable for most sites. However, for relatively small or unusually shaped buildings in vulnerable areas, tie provision should be calculated.
Type 2	General purpose tie, suitable for residential and small commercial buildings	15	Suitable for flat (less than 1 in 20) open sites where the fundamental basic wind velocity does not exceed 31m/s and altitude is not more than 150m above sea level.
Туре З	Basic wall ties, suitable for residential and small commercial buildings	15	As Type 2 but fundamental basic wind velocity limited to 27m/s.
Type 4	Light duty tie, suitable for box-form domestic dwellings	10	Suitable for flat sites (less than 1 in 20) in towns and cities where the fundamental basic wind velocity does not exceed 27m/s and altitude is not more than 150m above sea level.

Notes: Fundamental basic wind velocity must be calculated for the specific altitude of the site, refer to Clause NA.2.4 in NA to BS EN 1991-1- 4:2005. The table above provides only a brief summary of information. Refer to PD 6697:2019 and NA to BS EN 1991-1-4:2005 for complete information.

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Information adapted from NA to BS EN 1991-1-4:2005 for use with PD 6697:2019, calculating $C_{\rm alt}$ for an altitude of 150m above sea level. For some projects this may be conservative. Contact Leviat for further details.

	Substrate & Maximum Insulation Thickness (mm)				Vertical Screw	Vertical Wall Tie
Тіе Туре	Steel ¹	Timber ²	Concrete (CFS+) ³	Concrete (CFS) ³	Spacing (mm)	Spacing (mm)
1	220*	186*	270	270	225	300***
2	220*	186*	270	270	337.5	450
3	220*	186*	270	270	337.5/450**	450
4	220*	186*	270	270	337.5/450**	450

Note: Table assumes 25/14 channels at maximum 600mm horizontal centres. Wall tie centres shown achieve equivalent tie type performances to PD 6697, 6.2.2.5 Table 12 (Type M2 Mortar).

¹ Min. 1.2mm thick Steel.

² Min. C16 Timer.

³ Min. C20/25 Concrete.

* Suitable for use without an Ancon Compression Sleeve when using rigid insulations up to 220mm thick or any of the following with a maximum thickness of 180mm: Isover Polterm Max Plus, Kingspan Facades K-Roc Rainscreen Slab, KlasseROCK® Rainscreen Insulation, Knauf Insulation Rocksilk® Rainscreen Slab, ROCKWOOL Nyrock® Rainscreen 032, ROCKWOOL Rainscreen Duo Slab® and Unilin Insulation Stonewool SW/RS. For other insulation types, a Compression Sleeve will be required regardless of insulation thickness.

** 337.5mm centres for insulation thicknesses greater than 114mm

*** 225mm vertical tie spacing for Teplo-Channel Ties 300mm and longer.

The Construction applications and details provided in this guide are indicative only. In every case installation should be entrusted to appropriately qualified and experienced persons. Normal handling precautions should be taken to avoid physical injury. The company cannot be held responsible for any injury as a result of using our products, unless such injury arises as a result of our negligence. © Protected by copyright

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