Leviat®

Ancon®

25/14 Restraint System







Façade Support & Restraint

Wall Ties & Restraints

Imagine. Model. Make.

Leviat

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.





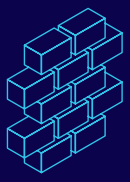




>3,000
People

60+
Locations

~20
Countries

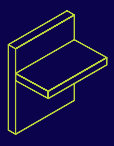


Façade Support & Restraint

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.

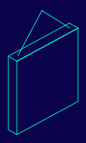
- Masonry Support Systems
- Windposts
- Lintels
- Brick Slip Systems
- Wall Ties & Restraints
- Masonry Reinforcement
- Natural Stone Façade Systems
- Cavity Trays
- Sandwich Panel anchor
- Suspended concrete façade
- Masonry Repair

Other areas of expertise:



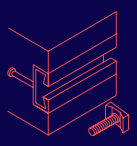
Structural Connections

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.



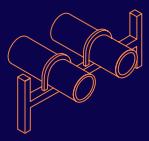
Anchoring & Fixing

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



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 25/14 Restraint System

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Ancon 25/14 Restraint System

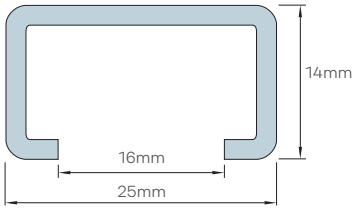
The Ancon 25/14 Restraint System is designed to tie masonry cladding to an in-situ structural frame, through a layer of insulation. It is suitable for use with steel, timber or concrete frames and any type of insulation.

The system comprises the following Ancon products: 25/14 Channel, SD25 or Teplo-BF-CT 25 Wall Ties, HT high thread screws (for fixing to steel/ timber) and either CFS+ or CFS screws (for fixing to concrete) and Compression Sleeves when required.

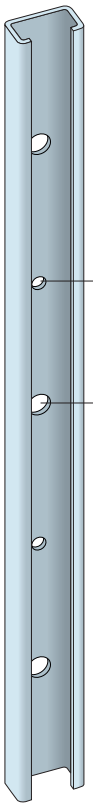
The 25/14 system has been independently tested by Lucideon. Declarations of Performance for SD25 ties are available to download from www.ancon.co.uk/approvals.

Ancon 25/14 Channel

Ancon 25/14 Channel is available in lengths of 2700mm and 3000mm. It features pre-punched holes at close centres to ensure a fixing position is always located near the end, even when it is cut on site. The channel has a 16mm opening to easily accommodate a drive socket.



Ancon 25/14 Channel Profile



Ancon 25/14 channel features alternate 5.3mm and 9.5mm diameter holes to accept different fixings.

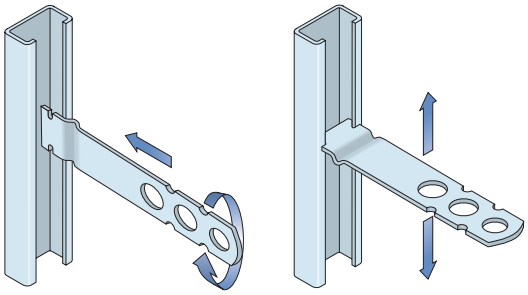
The smaller diameter holes should be used when fixing to steel or timber.

The larger diameter holes are to accommodate fixings for concrete.

Note: Using the incorrect hole and fixing screw combination invalidates the system performance

Ancon SD25 and Teplo-BF-CT 25 Wall Ties

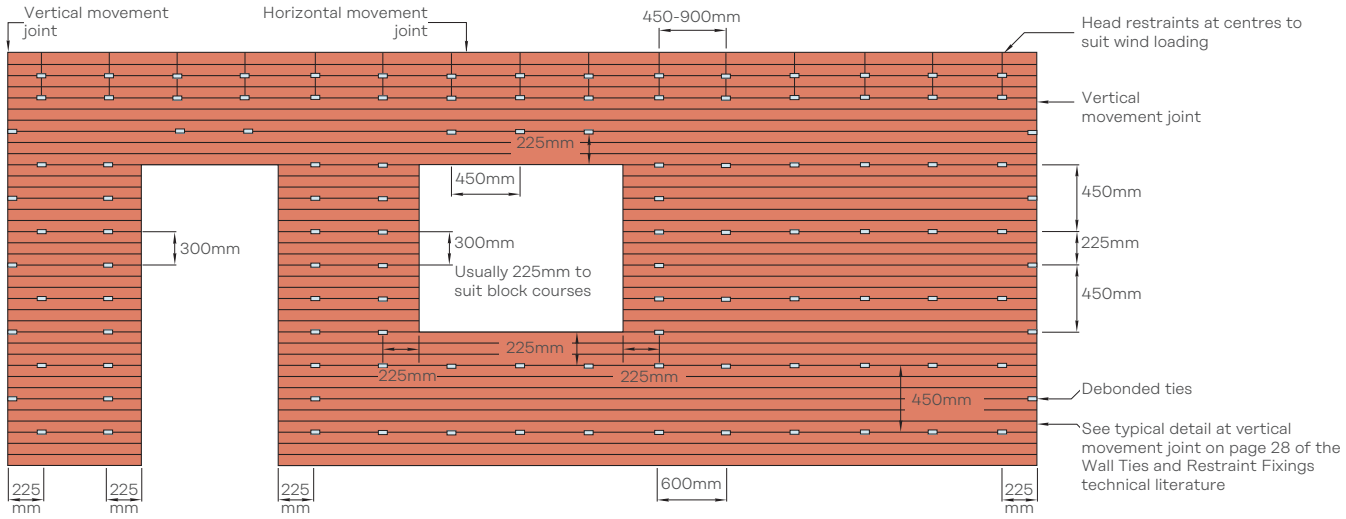
Ancon wall ties are available in various lengths to suit open cavities from 35mm to 334mm.They are located in the channel by rotating through 90° and can be easily moved to the required position where they are built into the masonry bed joint. See tables for wall tie references and fixing centres.



Wall Tie Lengths/References

Open Cavity (mm)	Tie Length (mm)	Ancon Tie Reference	
		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



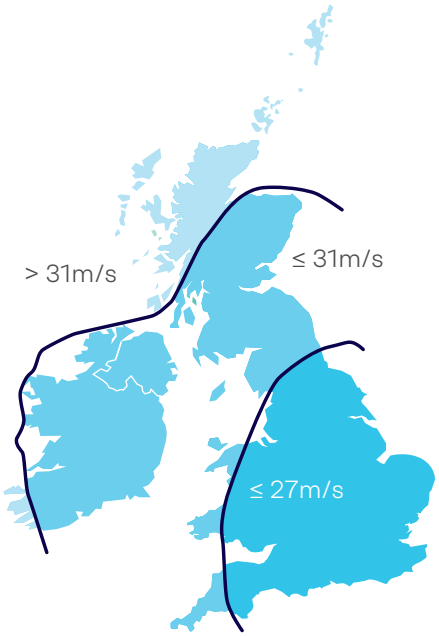
Typical spacing for wall ties using Ancon 25/14 Restraint System. Actual wall ties spacing will depend on Tie Type performance required - please refer to the Recommended Wall Tie spacing tables on the following pages.

Refer to PD 6697:2019 for complete information on wall tie positioning.

Ancon 25/14 Restraint System

Wall Tie Types

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 tall 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.
Type 3	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.



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

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.

Load tables

The following quick reference load tables assume 25/14 channels positioned at 600mm horizontal centres:

UK

Vertical Tie Spacing (mm)	Vertical Fixing Spacing (mm)	Pressure (kN/m^2, SLS)	Suction (kN/m^2, SLS)	Satisfies*
450	450	0.708	0.700	Tie Type 3
450	337.5	0.889	1.029	Tie Type 2
375	337.5	1.067	1.235	Tie Type 2
300	337.5	1.333	1.543	Tie Type 1
225	337.5	1.492	1.723	Tie Type 1
225	225	1.778	2.058	Tie Type 1

Notes: Pressure and suction calculated using partial factors γ_Q=1.5, γ_M=3.0.
*Wall tie types as per PD 6697:2019

ROI

Vertical Tie Spacing (mm)	Vertical Fixing Spacing (mm)	Pressure (kN/m^2, SLS)	Suction (kN/m^2, SLS)	Satisfies
450	450	0.787	0.778	-
450	337.5	0.988	1.143	-
375	337.5	1.186	1.372	SR 325
300	337.5	1.481	1.714	SR 325
225	337.5	1.658	1.914	SR 325
225	225	1.976	2.287	SR 325

Notes: Pressure and suction calculated using partial factors γ_Q=1.5, γ_M=2.7.

Ancon 25/14 Restraint System – Fixing to Steel

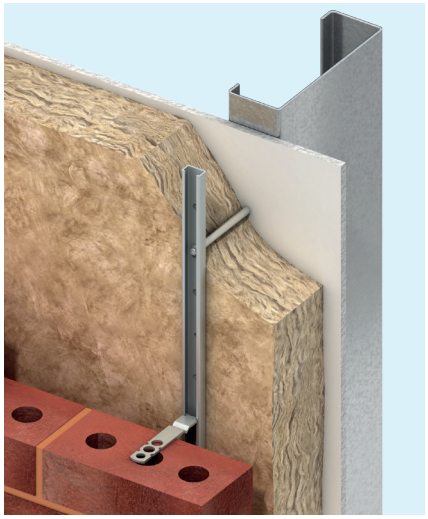
The Ancon 25/14 Restraint System can be fixed to a light steel frame through any type of insulation.

Self-drilling 'HTSS' high-thread screws fix through the channel and the insulation, into the steel. Once the channel is installed, stainless steel SD25 or basalt fibre Teplo-BF-CT 25 wall ties can be positioned at any point along its length and are built into the bed joints of the outer leaf of brickwork.

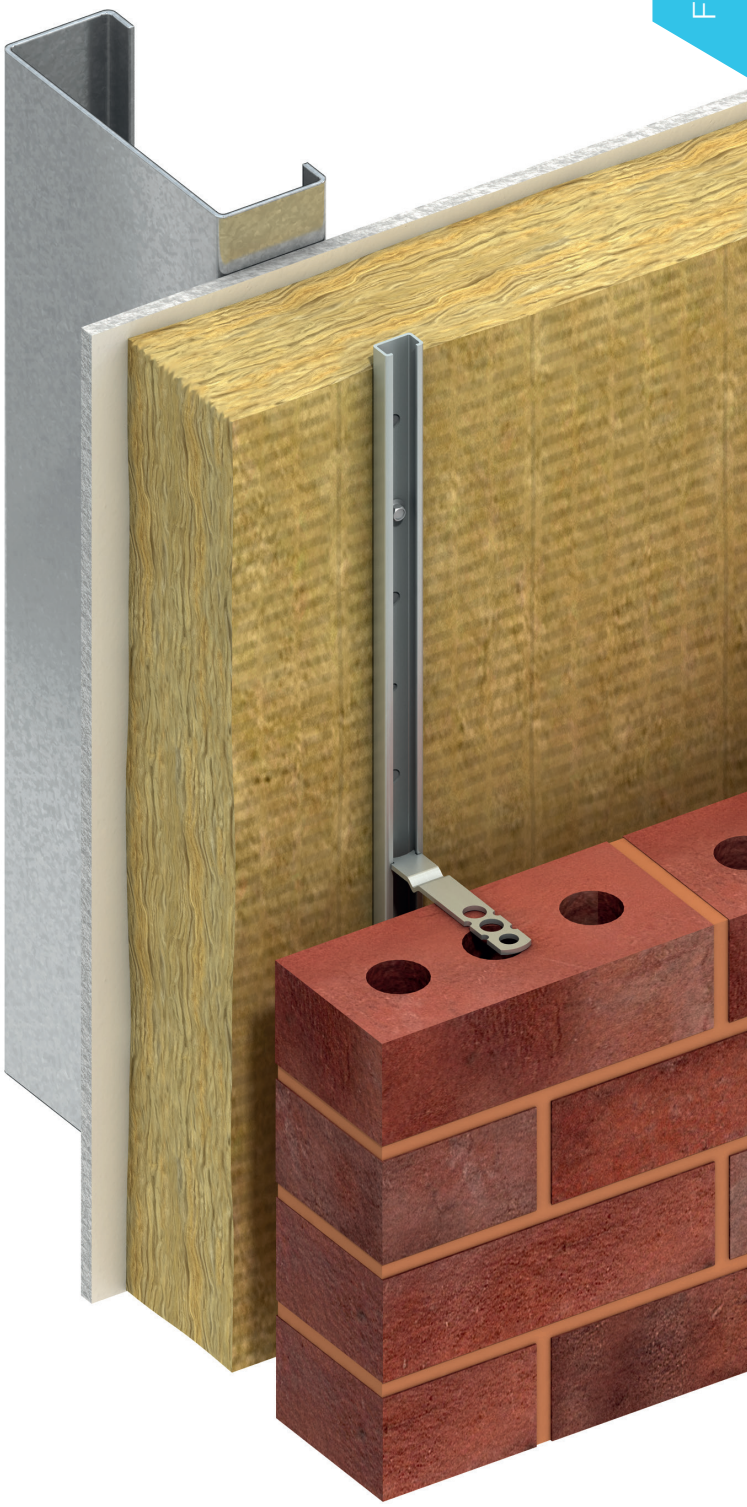
Self-drilling high-thread screws are available for use with a maximum combined insulation and backing board thickness of 220mm. The screws can be installed directly through any thickness of rigid insulation or directly through any of the following insulation products with a maximum thickness of 180mm:

- 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 semi-rigid/flexible insulations, an Ancon Compression Sleeve (the same depth as the insulation) should be used around the fixing screws to provide the necessary support.



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



Ancon 25/14 Restraint System

Ancon High-Thread Fixing Screws

'HTSS' 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 Fixing Screws feature a shaped drill tip of hardened steel that allows installation without pre-drilling. Drive sockets are available.

Stainless Steel High-Thread Fixing Screws

Insulation/Backing Material Thickness (mm)	Ancon Screw Reference	Screw Length (mm)
30-46	HTSS-65-2PT-W	65
35-61	HTSS-82-2PT-W	82
43-79	HTSS-100-2PT-W	100
60-94	HTSS-115-2PT-W	115
65-114	HTSS-135-2PT-W	135
80-129	HTSS-150-2PT-W	150
110-159	HTSS-180-2PT-W	180
142-170	HTSS-200-2PT-W	200
165-220	HTSS-240-2PT-W	240

Notes: 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. The Ancon 25/14 system is also suitable for fixing to timber with a maximum insulation & backing board thickness of 186mm. Contact us for more details.

Recommended Wall Tie and High-Thread Fixing Screw Spacing with 25/14 Channel at 600mm Horizontal Centres

Tie Type	Insulation Thickness (mm)	Vertical Tie Spacing (mm)	Vertical Fixing Spacing (mm)
1	Max 220	300**	225
2	Max 220	450	337.5
3	Max 220	450	337.5/450*
4	Max 220	450	337.5/450*

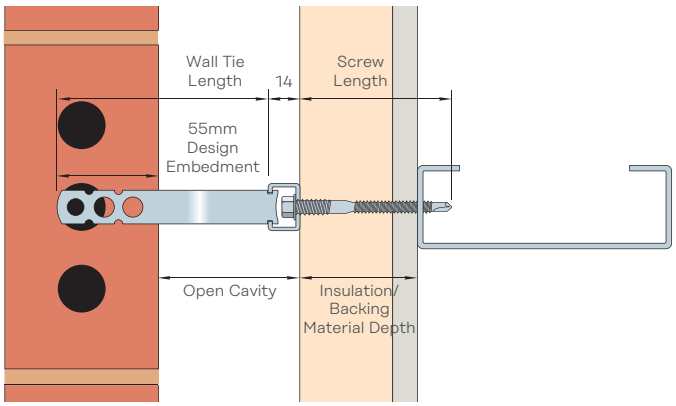
Notes: Centres shown achieve equivalent tie type performances to PD 6697 6.2.2.5 Table 12 (M2 Mortar). *337.5mm centres for insulation thicknesses greater than 114mm **225mm vertical tie spacing for Teplo-Channel Ties 300mm and longer.

System Components

25/14 Channel
Lengths: 2700, 3000mm

High-thread Fixing Screws
Lengths: For an insulation depth up to 220mm

SD25 or Teplo-BF-CT 25 Wall Ties
Lengths: For open cavities up to 334mm*
*up to 259mm for SD25 ties



Warranty

We provide a warranty on our stainless steel 25/14 system fixed with High-Thread screws, guaranteeing the design performance for 60 years. Contact us for full details and conditions.

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. Stainless steel SD25 or basalt fibre Teplo-BF-CT 25 wall ties can be positioned at any point along the length of the channel and are built into the bed joints of the outer leaf of brickwork.

Leviat offer a choice of two concrete screws; the new, exclusive CFS+ and the original CFS.

Note: Concrete strength is an important factor to consider when selecting a concrete screw. 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 selecting a screw when fixing into older concrete. Further information and additional guidance can be found in our installation guide.



Ancon CFS+

The Ancon CFS+ has been specifically developed for our 25/14 channel to provide a fully stainless steel concrete fixing solution.

The CFS+ boasts a number of benefits:

- Grade 1.4301 (304) as standard with 1.4401 (316) available on request.
- Design performance guaranteed for 60 years with our 25/14 warranty.
- Quicker, simplified installation – **Ancon Compression Sleeves are not required when using any length of CFS+.**
- Improved thermal performance thanks to its stainless steel construction*.
- Able to fix into particularly strong concrete (up to C50/60).
- ETA approved concrete screw end.

*Thermal modelling using 150mm thick insulation and 50mm clear cavity has shown thermal transmittance to be reduced by 50% compared to a zinc-plated carbon steel equivalent.



Ancon CFS+ Screw

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 test report complete with recommendations and bespoke proposed installation methodology.

Please contact us for prices and more information.

Ancon 25/14 Restraint System

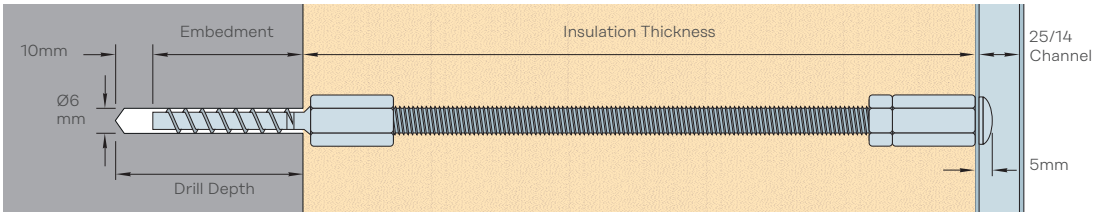
The CFS+ can be used with all insulation types and accommodates an insulation thickness of 50 to 270mm. A PGM approved drill bit should be used to drill a diameter 6mm pilot hole, 55mm deep for all CFS+ fixings. The CFS+ screw can be installed directly through the insulation and into the concrete frame.

Specification of the Ancon CFS+ is simply based on the total insulation thickness being used; for example a 'CFS+150' is suitable for fixing 25/14 channel through 150mm thick insulation into a concrete inner leaf. Please specify insulation thickness at the time of enquiry.

Recommended Wall Tie and CFS+ Fixing Screw Spacing with 25/14 Channel at 600mm Horizontal Centres

Tie Type	Insulation Thickness (mm)	Vertical Tie Spacing (mm)	Vertical Fixing Spacing (mm)
1	50-270	300**	225
2	50-270	450	337.5
3	50-270	450	337.5 / 450*
4	50-270	450	337.5 / 450*

Notes: Centres shown achieve equivalent tie type performances to PD 6697 6.2.2.5 Table 12 (M2 Mortar).
*337.5mm centres for insulation thicknesses greater than 114mm.
**225mm vertical tie spacing for Teplo-Channel Ties 300mm and longer.



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

System Components

25/14 Channel
Lengths: 2700, 3000mm

CFS+ Fixing Screws
Length to suit project specific insulation thickness, between 50mm and 270mm

SD25 or Teplo-BF-CT 25 Wall Ties
Lengths: For open cavities up to 334mm*
*up to 259mm for SD25 ties

Warranty
We provide a warranty on our stainless steel 25/14 system fixed with CFS+ screws, guaranteeing the design performance for 60 years. Contact us for full details and conditions.

Ancon CFS

The Ancon CFS can be used with all insulation types up to 270mm thick. A PGM approved drill bit should be used to drill a diameter 6mm pilot hole to the required depth (see table below). An Ancon Stainless Steel Compression Sleeve, the same depth as the insulation, is required and the screw is installed through the channel and the compression sleeve, located in the insulation, and into the pilot hole in the concrete frame.

CFS screws can also be used for fixing 25/14 channel directly back to a concrete frame where no insulation is being used. Please see the tables below for screw references, technical specifications and fixing centres.



CFS Concrete Fixing Screw

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.

Recommended Wall Tie and CFS Fixing Screw Spacing with 25/14 Channel at 600mm Horizontal Centres

Tie Type	Insulation Thickness (mm)	Vertical Tie Spacing (mm)	Vertical Fixing Spacing (mm)
1	Max 270	300**	225
2	Max 270	450	337.5
3	Max 270	450	337.5/450*
4	Max 270	450	337.5/450*

Notes: Centres shown achieve equivalent tie type performances to PD 6697 6.2.2.5 Table 12 (M2 Mortar).
*337.5mm centres for insulation thicknesses greater than 114mm.
**225mm vertical tie spacing for Teplo-Channel Ties 300mm and longer.

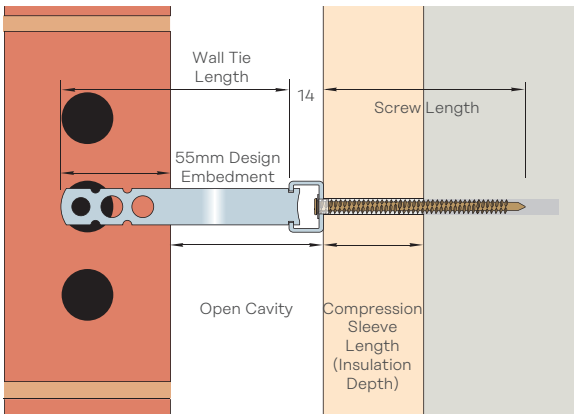
System Components

25/14 Channel
Lengths: 2700, 3000mm

Fixing Screws
Lengths: For an insulation depth up to 270mm

Compression Sleeve
Lengths: To suit insulation depth

SD25 or Teplo-BF-CT 25 Wall Ties
Lengths: For open cavities up to 334mm*
*up to 259mm for SD25 ties



Warranty

We provide a warranty on our stainless steel 25/14 system fixed with CFS screws, guaranteeing the design performance for 25 years. Contact us for full details and conditions.

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