Mechanical Fixing Systems for External Wall Insulation
Introduction

SPS envirowall insulated render systems are designed to not only improve the insulation and comfort factor of your building, but to also act as a weather proof coating. The insulation values can be tailored to suit particular project demands using different thicknesses and insulation types, but the weatherproofing characteristics are consistent irrespective of the insulation level.

The render coatings supplied by SPS envirowall have all been tested to ETAG 004 and/or MOAT 22 for their suitability and to determine a minimum life expectancy of 30 years (some systems have 60 years, please speak with SPS envirowall technical team for more information) and are reliant on the coatings remaining intact throughout this period.

This literature is divided into three parts.

Page 4 - 11 Mechanically fixing of insulation to various substrates

It is critical to the performance of the EWI system that the correct fixing and fixing pattern are used for the long term performance of the system and for its maintenance. The information contained within this guide will provide assistance in normal conditions. If there is any doubt about the nature of the substrate or wind loading, advice should be sought from our technical department.

Page 12 - 15 Fixing systems for the fitting of peripheral items to external wall insulation

Page 16 - 18 Appendix of standard fixing patterns to ensure adequate resistance to wind suction

Whilst it is possible to use spiral screws to support lightweight fittings to the render system, anything more than 5kg will need to be fixed back to the substrate which can cause issues with water ingress around these fixings. Where possible, support mechanisms should be incorporated into the design of the project to accommodate known fixtures and fittings and potential fixtures.

Industry practice has been to use a treated block of hardwood buried within the system, but this has its own problems such as ensuring it is the correct thickness, it is capable of supporting the loads being applied to it and that the items are fixed to the middle of the block. This guide is aimed at propriety products that are available in the market place that allow for removal and refitting of fixtures and fittings without losing mechanical strength or damaging the EWI system.
Mechanical fixing of insulation to various substrates

Mechanical fixings or anchors play an important function in the way in which External Wall Insulation Systems perform under building and dynamic loadings. The role of the fixing is far greater than simply holding the insulation in place until the render is applied, it has to accommodate movement within the structure, positive and negative wind pressure and supporting the self-weight of the system to name a few key functions.

There are a number of different fixings that can be used and it is important to select the correct fixing for the application and in some instances this requires on site pull out tests to be completed to determine the performance of the fixing with the substrate.

Based on site conditions and location along with site based test results, a specific fixing pattern may be required. Please contact SPSenvirowall technical team for advice.

All masonry based EWI fixings are tested and Certified in accordance with ETAG 014 ‘Plastic Anchors for ETICS’. Within this standard there are 5 categories for which the fixings can be Certified as being acceptable to be used in and these can be seen in the table below. If a substrate is not categorised then on site testing must be done.

### Substrate Classifications as Defined Under ETAG 014

**Anchors to use in:**

<table>
<thead>
<tr>
<th>Substrate Classifications</th>
<th>Anchors to use in:</th>
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<tr>
<td>A</td>
<td>Normal Weight Concrete</td>
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<tr>
<td>B</td>
<td>Solid Masonry</td>
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<td>Hollow or Perforated Masonry</td>
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<td>D</td>
<td>Lightweight Aggregated Concrete</td>
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<tr>
<td>E</td>
<td>Autoclaved Aerated Concrete</td>
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**Plastic Pin Masonry Screw Fixing**  
**ESPS PPs ‘PTH SX’**

- Anchor body material: Polypropylene
- Pin material: Reinforced Polyamide
- Hammer or Screw set: Screw
- Minimum embedment depth: 35 mm
- Drill hole diameter: 8 mm
- Point thermal transmittance: 0.000 W/K
- ETA Certificate Number: 10/0028
- ETA Classification: A – B – C – D – E
- Typical pull out into solid brick: 1.20 kN
- Lengths: 135 – 255 mm
- Qty per box: 200 for 135 & 155 mm lengths
  100 for lengths over 155 mm
Plastic Pin Masonry Hammer Fixing
ESPS PPh ‘PTH X’

Anchor body material : Polypropylene
Pin material : Polyamide
Hammer or Screw set : Hammer
Minimum embedment depth : 35 mm
Drill hole diameter : 8 mm
Point thermal transmittance : 0.000 W/K

ETA Certificate Number : 13/0951
ETA Classification : A – B – C – D
Typical pull out into solid brick : 0.75 kN

Lengths : 115 – 255 mm
Qty per box : 200 for lengths up to 175 mm
100 for lengths over 175 mm

Plastic Pin Masonry Hammer Fixing
ESPS PPh ‘KI 10’

Anchor body material : Polypropylene
Pin material : Polypropylene
Hammer or Screw set : Hammer
Minimum embedment depth : 25 mm
Drill hole diameter : 10 mm
Point thermal transmittance : 0.000 W/K

ETA Certificate Number : 07/0291
ETA Classification : A – B – C – D – E
Typical pull out into solid brick : 0.50 kN

Lengths : 70 – 220 mm
Qty per box : 250

Plastic Pin Masonry Hammer Fixing
ESPS PPh ‘H3’

Anchor body material : Polypropylene
Pin material : Polyamide
Hammer or Screw set : Hammer
Minimum embedment depth : 25 mm
Drill hole diameter : 8 mm
Point thermal transmittance : 0.000 W/K

ETA Certificate Number : 14/0130
ETA Classification : A – B – C
Typical pull out into solid brick : 0.60 kN

Lengths : 75 – 235 mm
Qty per box : 200 for lengths upto 155mm
100 for lengths over 155mm
Plastic Pin Masonry Hammer Fixing
ESPS PPh ‘PTH X’

- Anchor body material: Polypropylene
- Pin material: Polyamide
- Hammer or Screw set: Hammer
- Minimum embedment depth: 35 mm
- Drill hole diameter: 8 mm
- Point thermal transmittance: 0.000 W/K

- ETA Certificate Number: 13/0951
- ETA Classification: A – B – C – D
- Typical pull out into solid brick: 0.75 kN

- Lengths: 115 – 255 mm
- Qty per box: 200 for lengths up to 175 mm
  100 for lengths over 175 mm

Plastic Pin Masonry Hammer Fixing
ESPS PPh ‘KI 10’

- Anchor body material: Polypropylene
- Pin material: Polypropylene
- Hammer or Screw set: Hammer
- Minimum embedment depth: 25 mm
- Drill hole diameter: 10 mm
- Point thermal transmittance: 0.000 W/K

- ETA Certificate Number: 07/0291
- ETA Classification: A – B – C – D
- Typical pull out into solid brick: 0.50 kN

- Lengths: 70 – 220 mm
- Qty per box: 250

Plastic Pin Masonry Hammer Fixing
ESPS PPh ‘H3’

- Anchor body material: Polypropylene
- Pin material: Polyamide
- Hammer or Screw set: Hammer
- Minimum embedment depth: 35 mm
- Drill hole diameter: 8 mm
- Point thermal transmittance: 0.000 W/K

- ETA Certificate Number: 14/0130
- ETA Classification: A – B – C
- Typical pull out into solid brick: 0.60 kN

- Lengths: 75 – 235 mm
- Qty per box: 200 for lengths up to 155mm
  100 for lengths over 155mm
**Metal Pin Masonry Hammer Fixing**

**ESPS MPh ‘PTH KZ’**

Anchor body material : Polypropylene  
Pin material : Galvanised steel  
Hammer or Screw set : Hammer  
Minimum embedment depth : 25 mm  
Drill hole diameter : 8 mm  
Point thermal transmittance : 0.002 W/K  
ETA Certificate Number : 05/0055  
ETA Classification : A – B – C – D  
Typical pull out into solid brick : 0.90 kN  
Lengths : 75 – 295 mm  
Qty per box : 200 for lengths up to 155 mm  
100 for lengths over 155 mm

**Metal Pin Masonry Hammer Fixing**

**ESPS MPh ‘TFIX 8M’**

Anchor body material : Polypropylene  
Pin material : Galvanised steel  
Hammer or Screw set : Hammer  
Minimum embedment depth : 25 mm  
Drill hole diameter : 8 mm  
Point thermal transmittance : 0.002 W/K  
ETA Certificate Number : 07/036  
ETA Classification : A – B – C  
Typical pull out into solid brick : 1.20 kN  
Lengths : 95 – 295 mm  
Qty per box : 200 for lengths up to 195 mm  
100 for lengths over 195 mm

**Metal Pin Masonry Hammer Fixing**

**ESPS MPh ‘NT U’**

Anchor body material : Polyethylene  
Pin material : Galvanised steel  
Hammer or Screw set : Hammer  
Minimum embedment depth : 25 mm  
Drill hole diameter : 8 mm  
Point thermal transmittance : 0.002 W/K  
ETA Certificate Number : 05/0009  
ETA Classification : A – B – C  
Typical pull out into solid brick : 1.50 kN  
Lengths : 95 – 295 mm  
Qty per box : 100
**Metal Pin Masonry Screw Fixing**

**ESPS MPs ‘PTH S’**

- Anchor body material: Polypropylene
- Pin material: Galvanised steel
- Hammer or Screw set: Screw
- Minimum embedment depth: 25 mm
- Drill hole diameter: 8 mm
- Point thermal transmittance: 0.002 W/K
- ETA Certificate Number: 08/0267
- ETA Classification: A – B – C – D – E
- Typical pull out into solid brick: 1.50 kN
- Lengths: 95 – 475 mm
- Qty per box: 200 for lengths up to 155 mm
  100 for lengths over 155 mm

**Metal Pin Masonry Screw Fixing**

**ESPS MPs ‘TFIX 8S’**

- Anchor body material: Polypropylene
- Pin material: Galvanised steel
- Hammer or Screw set: Screw
- Minimum embedment depth: 25 mm
- Drill hole diameter: 8 mm
- Point thermal transmittance: 0.002 W/K
- ETA Certificate Number: 11/0144
- ETA Classification: A – B – C – D – E
- Typical pull out into solid brick: 1.20 kN

**Metal Pin Masonry Screw Fixing**

**ESPS MPs ‘STR U 2G’**

- Anchor body material: Polyethylene
- Pin material: Galvanised steel
- Hammer or Screw set: Screw
- Minimum embedment depth: 25 mm
- Drill hole diameter: 8 mm
- Point thermal transmittance: 0.002 W/K
- ETA Certificate Number: 04/0023
- ETA Classification: A – B – C – D – E
- Typical pull out into solid brick: 1.50 kN
- Lengths: 115 – 455 mm
- Qty per box: 200 for lengths up to 195 mm
  100 for lengths over 195 mm
**SPS envirowall ‘TKR screw and washer’**

This is a two part product that consists of a 4.8mm screw fixing and insulation washer for use when fixing into sheathing boards. It is important to ensure the sheathing board provides the correct pull out resistance required. Please contact SPS envirowall technical team for further assistance.

Capped and uncapped washers are available.

- Anchor body material: Polypropylene
- Pin material: Carbon steel
- Hammer or Screw set: Screw
- Minimum embedment depth: 20 mm
- Drill hole diameter: Self-tapping
- Point thermal transmittance: 0.002 W/K

Lengths: 50 – 300 mm
Qty per box: 100

**SPS envirowall ‘Fire Barrier Fixing’**

Used for fixing Rockwool Lamella fire barriers in EPS and Phenolic systems where required. Fixing frequency is 2 per 1m length of Lamella. This fixing is secured by shank compression and relies on being forced into a hole smaller than its diameter.

- Anchor body material: Stainless steel
- Pin material: N/A
- Hammer or Screw set: Hammer
- Minimum embedment depth: 50 mm
- Drill hole diameter: 8mm
- Point thermal transmittance: 0.002 W/K

Lengths: 90 – 300mm
Qty per box: 250

**SPS envirowall ‘Lipped Hammer Fixing’**

Lipped hammer fixings have a wider flange than normal hammer fixings making them ideal for securing base tracks, stop profiles and TS Rail supports into concrete / masonry substrates.

- Anchor body material: Polyamide 6
- Pin material: Galvanised steel
- Hammer or Screw set: Hammer
- Minimum embedment depth: 30 mm
- Drill hole diameter: 6 mm

Lengths: 6 15/45 for items up to 15mm thick
6 35/65 for items up to 35mm thick
Qty per box: 100
Oversized washer ‘IT PTH’

Depending on wind loads and fixing patterns an oversized washer may be required to increase the surface area of the fastener head. These are designed to work with our normal fixings with the fixing being inserted into the washer, there is no requirement to dismantle the fixing or change parts.

For use with PTH X, PTH KZ and PTH S fixings only

Washer material : Polypropylene
Washer size : 100 and 140 mm
Qty per box : 100

Oversized washer ‘KWL’

Depending on wind loads and fixing patterns an oversized washer may be required to increase the surface area of the fastener head. These are designed to work with our normal fixings with the fixing being inserted into the washer, there is no requirement to dismantle the fixing or change parts.

For use with KI10, TFix 8M and TFix 8S fixings only

Washer material : Polypropylene
Washer size : 90, 110 140 mm
Qty per box : 200

Oversized washer ‘VT90 and SBL140’

Depending on wind loads and fixing patterns an oversized washer may be required to increase the surface area of the fastener head. These are designed to work with our normal fixings with the fixing being inserted into the washer, there is no requirement to dismantle the fixing or change parts.

For use with IDK T, NTU and STRU 2G fixings only

Washer material : Polyamide
Washer size : 90 & 140 mm
Qty per box : 100
**SPSenvirowall ‘ELS50, ELS70 & ELSHT 98’**

Self-tapping fixings used for fixing rail supports used as part of the SPSenvirowall TS Rail system. For fixing into sheathing boards, but can cut into lightweight steel framed sections supporting the sheathing board.

- **Pin material:** Carbon steel
- **Hammer or Screw set:** Screw with hex head 5.5mm
- **Minimum embedment depth:** 20 mm
- **Drill hole diameter:** Self-tapping

**Lengths:**
- ELS50 for cavities up to 20mm
- ELS70 for cavities 21 – 40mm
- ELSHT98 for cavities 41 – 50mm

**Qty per box:**
- 100

**SPSenvirowall ‘RKW 41 and RKC 41 Climaseal’**

For fixing SPSenvirowall RendaClad boards to timber or metal support battens.

The fixings are coated with a Climaseal thermoset coating which gives excellent resistance to corrosion.

RKW fixings are used for fixing to timber support battens and RKC fixings are used when fixing to SPSenvirowall RCTH 25 top hat sections.

- **Hammer or Screw set:** Screw
- **Drill hole diameter:** Self-tapping

**Lengths:**
- 41mm

**Qty per box:**
- 500

**SPSenvirowall ‘ESPDU – Spiral Anchor’**

For securing lightweight fittings (up to 5kg) to the EWI system after completion of the render. The fixing is designed to work with no pre-drilling, but with heavier render coatings a pilot hole may be required. After the fixing has been initially fitted, a mastic seal must be placed around the last thread section before final tightening. Standard external grade screws can then be used (up to 50mm embedment) for securing lightweight fixtures and fittings.

- **Anchor body material:** Polypropylene
- **Pin material:** N/A
- **Hammer or Screw set:** Screw
- **Minimum embedment depth:** 50 mm
- **Drill hole diameter:** Self-tapping

**Lengths:**
- 50mm
Proprietary boxed bracket fixing systems

Satellite Bracket Twin Arm Anti-vibration
Hot dipped 3mm galvanised steel twin arm bracket available in 9 inch, 12 inch or 16 inch arm length. The longer arm lengths allow for greater rotation of the dish for receiving the correct signal strength.

Comes complete with anti-vibration stainless steel boxes to each arm to prevent cracks forming in the render from high winds. The boxes can be adjusted into position to suit the EWI depth.

Suitable for accepting all satellite dishes and aerial masts up to 3m in length. Supplied with 2 number U clamps and white cover plates to anti-vibration boxes.

Eyelet Support Bracket
Stainless steel support bracket with surrounding universal box finished with white PVC cover plate.

20mm internal diameter stainless steel eyelet bolt for securing washing lines, dog leads, bicycle chains, etc.

The eyelet bolt is supported via a secondary support bracket and fixed back to the main bracket leg for additional flexural strength.

Flower Basket Bracket
Stainless steel support bracket with surrounding universal box finished with white PVC cover plate.

6mm finished stainless steel support bracket for hanging baskets up to 12 inches in size.

The support bracket is supported via a secondary support bracket and fixed back to the main bracket leg for additional flexural strength.
**Fence Panel Bracket**

Stainless steel support bracket with surrounding universal box finished with white PVC cover plate.

Bracket is supplied with a 45mm universal bracket for securing fence panels.

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**Fence Post Bracket**

Stainless steel support bracket with surrounding universal box finished with white PVC cover plate.

Bracket is supplied with an exposed 100mm long carbon steel bolt for securing fence posts. The bolt can be cut on site to the length required, no nut is supplied.

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**Downpipe Bracket**

Stainless steel support bracket with surrounding universal box finished with white PVC cover plate.

Fixing is through a universal threaded hole ready to take a support clip.

Down pipe and support clip shown for display purposes only, not supplied as part of the bracket.

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**Electrical Junction Box**

Stainless steel support bracket with surrounding universal box finished with white PVC cover plate.

The face plate has a universal beza plate for safely securing electrical fittings including external alarms. Bracket is supplied with electrical connection box and fly lead to enable the product to be safely earthed.

Light shown for demonstration purposes only and not supplied with bracket.

IEE regulations state that no screwed joint is to be inaccessible.
**Water Tap Bracket**

Stainless steel support bracket with surrounding universal box finished with white PVC cover plate.

Copper grade external tap supplied with metal braided tail and compression joint.

**Power Networks**

This box has been approved by UK Power Networks for installing around their existing T bars without causing disruption to the power supply or having to remove their cable.

The stainless steel box is split on the one side to allow the box to be opened up and fitted around the existing T bar. The box is adjusted on the T bar using the sliding holder to the desired position to suit the EWI system depth. The two piece cover plate is fitted and sealed with mastic to finish.

**General Notes for Boxed Brackets**

The stainless steel box is universal in size throughout all of the support brackets making the range interchangeable for most covers without the need for changing the box.

The boxes are supplied with slotted holes on the side allowing for nominal adjustment on site. The boxes are supplied for use with 90mm insulation as standard, other sizes available on request.

The cover plates are supplied with an insulation backing and sealing tape to reduce the cold bridge at these locations.

The cover plate has a channelled groove around the inside edge to allow for the application of mastic prior to fitting to allow a water tight seal.
Spiral Anchors

For securing lightweight fittings (up to 5kg) to the EWI system after completion of the render. The fixing is designed to work with no pre-drilling, but with heavier render coatings a pilot hole may be required.

After the fixing has been initially fitted, a mastic seal must be placed around the last thread section before final tightening. Standard external grade screws can then be used (up to 50mm embedment) for securing lightweight fixtures and fittings.

Dart Anchors

For securing lightweight to medium weight fittings (up to 11kg). These fixings can be used as a retrofit solution after the render is complete. Using an 8mm drill bit simply drill through the render system and into the substrate, insert the Dart Anchor and tighten up.

The head of the Dart Anchor comes with two fins opposite each other, it is important that the fins are inserted into the render system to help with the loads, i.e. for signage the fins run at 3 and 9 o’clock and for down pipes the fins run at 12 and 6 o’clock.

Once inserted, using a number 8 external grade screw the external fixture can be fitted into the head of the Dart Anchor.

CompacFoam High Density EPS

CompFoam is a modern construction and insulation material made from mono-material EPS, which combines stability and good heat insulation with very low dead weight. It is a flexible, applicable construction element and at the same time can be used as a high-quality insulation material. This combination makes it particularly economical.

CompacFoam is an ideal replacement for the hidden treated hardwood pattress blocks to reduce the cold bridge.

CompacFoam comes in various grades from 150 to 400kg/m³ but as a guide, the CF200 grade can accommodate loads up to 60kg providing there is one masonry anchor through the external fitting through to the substrate, or 30kg with loads directly fixed to the EPS block.

ISO Cube

The ISO Cube is designed to be hidden within the ETICS system and the finished render coats for securing external fixture and fittings. It is manufactured from polyurethane resin which reduces the cold bridging at this location when compared to the traditional timber pattress support.

ISO Cube is available in a block form, ‘ISO Cube XL’, for main wall areas, or an ‘L’ shape for corner fixtures, ‘ISO Cube L’. They are available in 120, 140 and 200mm depths and can be cut on site using a standard disc cutter. There are guides in the outer section at 10mm increments to aid this.

This product is ideal for supporting heavier fixtures such as Juliet balconies and window shutters.
Option 1 - EPS or Mineral Wool

Option 2 - (Frame only)

Additional fixings at approx. 300mm centres around aperture.

IMPORTANT NOTE: Mineral board is being applied with acrylic adhesive or any "Hi-tack" system is not suitable for dryfix method.
OPTION 1 - (EPS or Mineral Wool)

Add/Remove fillings at approx. 300mm centres around apertures

OPTION 2 - (Panel only)