Baumit
External Wall Insulation

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ETICS Installation Guidelines step by step

- General informations
- General processing rules
- Version April 2011

Ideen mit Zukunft.

Step by step ...

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Step 1 **Base rail**	▪ *Fixing the base rail* ▪ *Corners* ▪ *Clip on trim*	
Step 2 **Insulation boards**	▪ *Applying the adhesive mortar* ▪ *Fitting the insulation boards* ▪ *Joints and connections* ▪ *Window sills and reveals*	
Step 3 **Windows**	▪ *Sills* ▪ *Reveals*	
Step 4 **Fixing anchors**	▪ *Requirements* ▪ *Drilling and fixing*	
Step 5 **Base coat**	▪ *Beading and profiles* ▪ *Applying the base coat render* ▪ *Reinforcement mesh*	
Step 6 ***Finish coat***	▪ *Priming the base coat* ▪ *Applying the finish coat* ▪ *Finishing options*	

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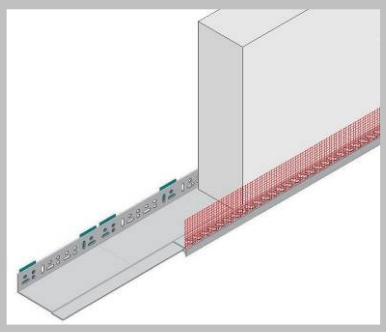
Base profile *"therm"*

The base profile protects the underside of the to the first row of insulation boards

Products

Baumit Base Profile "therm" - PVC "L" section profile, plastic connector pins and clip-on drip bead with a mesh attachment.
Baumit Montage Set - plug and screw fixings and plastic packers for fixing the base profile.



Avantages

- Reduced thermal bridging
- Easy to cut
- Unhindered drilling and fixing
- Won't bend in transit

Fixing the Baumit Base Profile "therm"

- Mark the wall surface with a chalk line to guide where the profile will sit.
- The profile is fixed into position at or above the horizontal damp proofing course (DPC) of the wall.
- It must sit level and in line and be fixed at max. 300mm centres.
- A packer must <u>always</u> be used with the plug and screw fixings to accommodate the adhesive mortar thickness between the insulation board and the substrate.

Corners

Corners (internal and external) can be formed with two 45º angled cuts of the base profile.

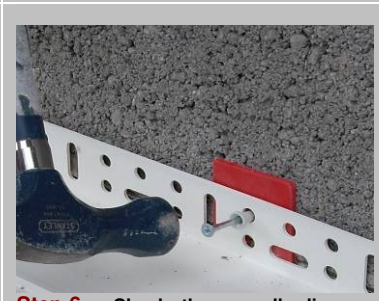
Step 1 Starting at one end; drill a bore hole into the substrate through the perforated upstand on the L-section.

Step 2 Push the screw fixing through into the bore hole just tight enough to support the L-section.

Step 3 Place a packer between the substrate and the L section and push it down onto the fixing shaft until it clicks.

Step 4 Check for level with a long sprit level and continue fixing.

Step 4 Butt each following L-section up tight and continue until a complete wall section is finished.



Step 6 Check the overall alignment of the L-sections and insert more packers where needed. Screw or hammer the fixing up tight.

Step 7 Cut the L-section with an angle grinder or hack saw.

Step 8 Line up the angled cuts to form the corner.

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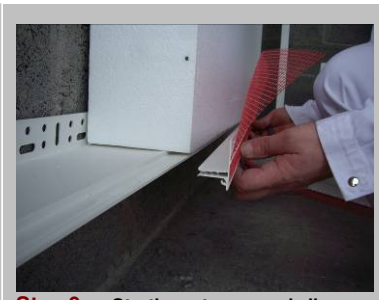
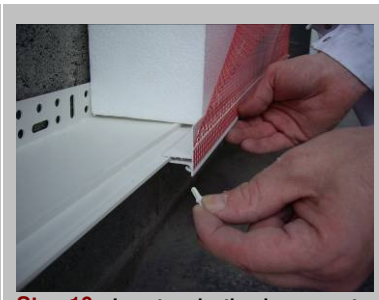
Base profile *"therm"*

Fixing the Drip Bead

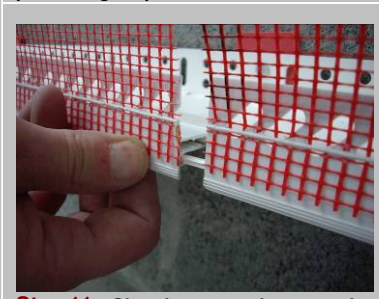
- The insulation boards must be fitted and stable before clipping on the base profile drip bead.
- Cut the trim with an angle grinder or snips.
- The "L" section joints must be overlapped by at least 100mm with the drip bead.



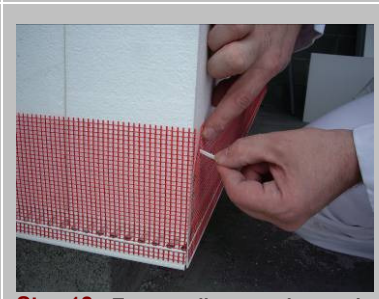
Step 9 Starting at one end, line up the drip bead with the lip of the base profile and push in tight up to the insulation board



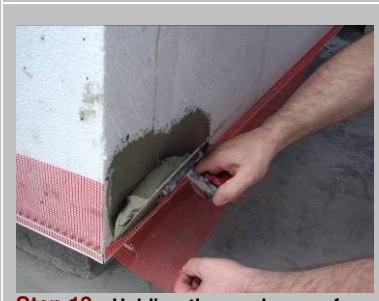
Step 10 Insert a plastic pin connector into the clip-on trim.



Step 11 Slot the next trim onto the pin connector and push the trim up tight to the insulation boards.

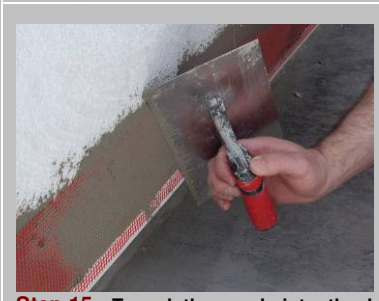


Step 12 Temporarily prop the mesh strip with a trim connector.

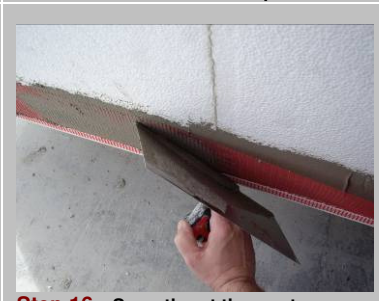


Step 13 Holding the mesh away from the boards,

Step 14 Apply a full layer of base coat mortar behind the mesh strip.



Step 15 Trowel the mesh into the base coat mortar.



Step 16 Smooth out the mortar.

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Insulation boards EPS

The insulation boards provide the thermal wrap around a building.

Components

EPS Insulation Boards – Grey or white expanded polystyrene boards manufactured according to EN 13163

General

- The insulation boards should be fitted with the joints butted tightly and the surfaces flush.
- The joints between the boards must be free of adhesive mortar.
- Each row should stagger bond over the previous one by about half a board. Fig 2.
- Board off-cuts (min. 150 mm lengths) may be used in the main wall areas but not at the building corners or openings. Fig. 1
- Board edges must not form a cross joint at the corners of openings as this may induce cracking in the render. Fig.3
- All connections to other building elements and penetrations through the EWI must be properly sealed with joint seal band to resist driven rain and accommodate expansion and contraction.
- All construction movement joints must be incorporated into the insulation system and be watertight. Fig.8

Projecting elements

Small elements protruding from the background may be bridged over by cutting out recesses in the back of the insulation board. (See fig. 6)

- A maximum of one third of the board thickness may be removed to cover protruding elements.
- **Check with service providers regarding access requirements to pipework, cables etc before concealing behind the EWI system. Fig.6**

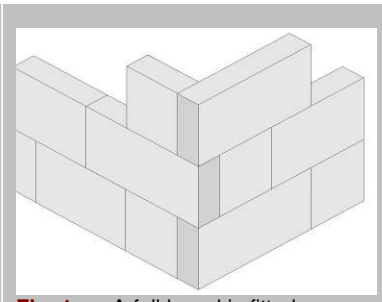

Fig. 1 A full board is fitted on one side of the building corner and a half board on the other side. This is reversed on the next row.

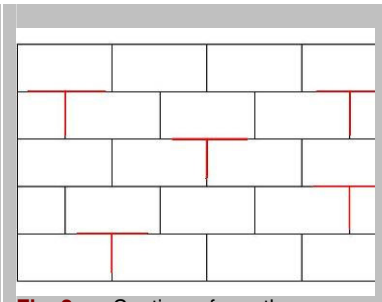

Fig. 2 Continue from the corner with full boards along each row to produce a staggered half bond or T-joint pattern.

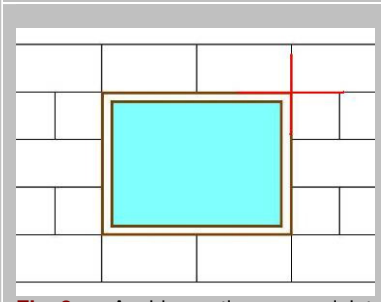

Fig. 3 Avoid creating cross joints at openings.

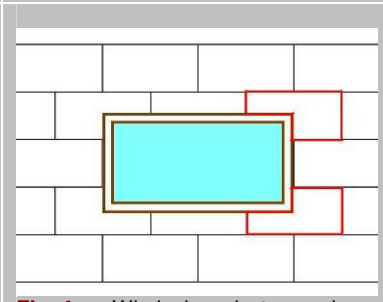

Fig. 4 Whole boards to used around the corners of window and other construction openings.

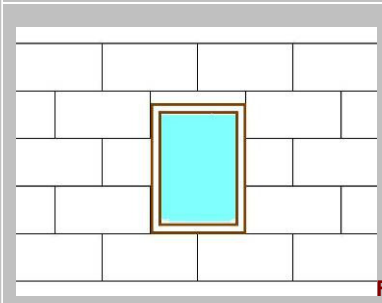

Fig. 5 Another acceptable method creating no cross joints.

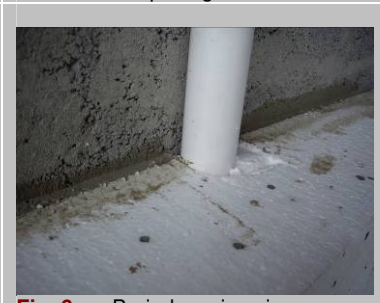

Fig. 6 Buried service pipe

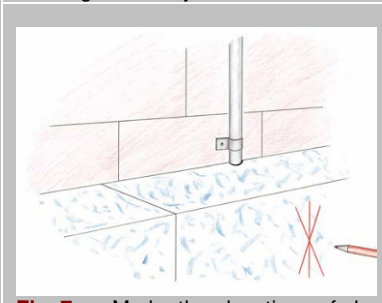

Fig. 7 Mark the location of buried service pipes to avoid damage caused by through fixings.

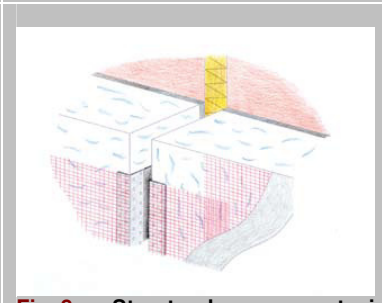

Fig. 8 Structural movement joint incorporated into the EWI system.

Step by step ...

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Fitting the insulation boards

Components
Baumit Bonding Mortar DC 56
Baumit Bonding Mortar„open“W
EPS Insulation Board

Mixing the adhesive mortar
The adhesive mortar can be mixed with an electric hand (Fig. 1) mixer or a horizontal mixer (Fig. 2).

- Leave the adhesive mortar to stand for five minutes and quickly mix through again with the hand mixer.
- The adhesive mortar remains workable for up to 1½ hours.
- Do not remix the adhesive mortar later with more water!

Applying the adhesive mortar
- Use stainless steel tools!

The standard application method (Fig. 3) can cope with background undulations up to 10 mm.
Enough adhesive mortar to obtain a min. 5mm bonding joint and a min. 40% bonding contact to the substrate surface
The mortar strip seals the back edges of the board to prevent air circulating and the bond strength resists potential curling of the board through shrinkage.
A direct mix and application from a mortar pump with a pistol attachment speeds ups working time. (Fig. 4).

An alternative (Fig 5). full surface bonding application is limited to very flat backgrounds such as precast concrete formwork

Fitting the insulation board
- Always fit the insulation board immediately after applying the adhesive mortar.
- Keep the edges of the insulation boards clean. (Fig 8.)

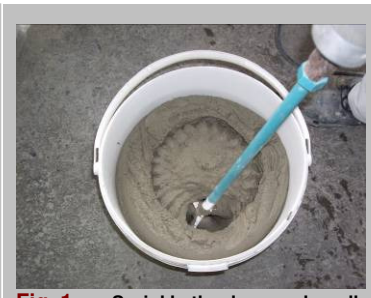

Fig. 1 Sprinkle the dry powder adhesive into clean water. Mix with an electric hand mixer at slow speed setting to a smooth, workable mortar.

Fig. 2 Alternatively a horizontal mixer provides instantly mixed mortar at the touch of a button!

Fig. 3 Apply 3 equally spaced adhesive mortar dabs through the centre line of the insulation board and a strip around the edge.

Fig. 4 A direct mix and application from a mortar pump with a pistol attachment speeds up the application of the adhesive mortar to the board.

Fig. 5 Apply a full coat of adhesive mortar onto the insulation board surface and comb through with a stainless steel notched trowel.

Fig. 6 Place the board on to the wall and “wiggle” it into position.

Fig. 7 Butt the boards tightly together and ensure the surfaces are flush.

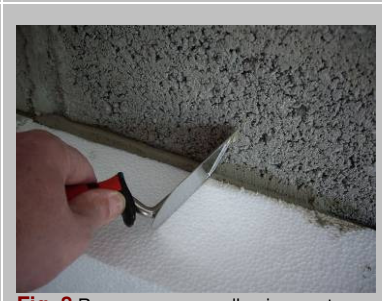

Fig. 8 Remove excess adhesive mortar

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Fitting the insulation boards

Components
Baumit System Foam B1

Filling joints

- Gaps between boards over 5mm must be filled in with insulation material. (Figs. 11-13)
- Gaps up to 5mm can be filled in with system insulating foam using a foam gun. (Fig. 14)
- The final surface should be smooth and flat. (Fig. 15)
- Remove all dust from the surface prior to the application of the base coat.

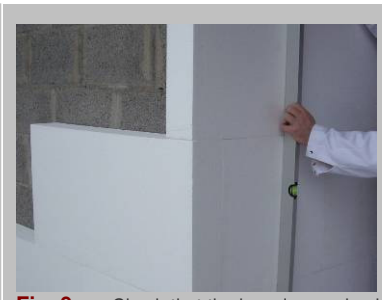

Fig. 9 Check that the boards are plumb and in line. Do not bang the boards.

Fig. 10 EPS insulation boards can be cut with a hand saw, a “hot knife” or a “hot wire”.!

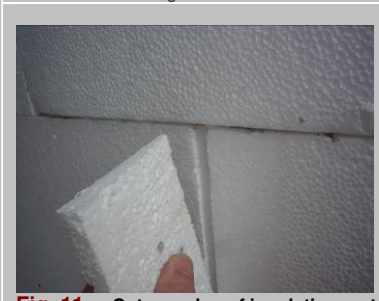

Fig. 11 **Cut a wedge of insulation material.**

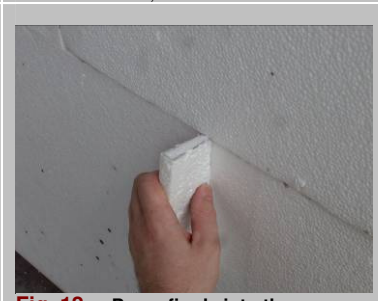

Fig. 12 **Press firmly into the gap.**

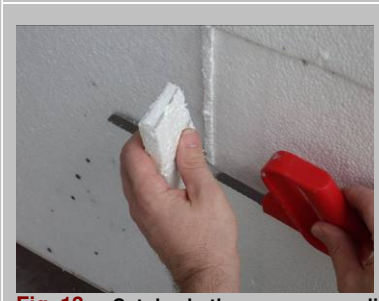

Fig. 13 **Cut back the excess as slightly proud of the surface.**

Fig. 14 **Fill in joint gaps less than 5mm with system foam.**

Fig. 15 **Rasp back the surface of the insulation boards, removing all undulations leaving a smooth flat surface.**

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Connections, joints and penetrations

The joints between the insulation material and other building elements (window and door frames, sills, soffits etc) must resist water penetration and accommodate expansion and contraction.

Products

Joint Seal Band:
15/2-6 for 2 - 6mm joints
15/3-9 for 3 - 9mm joints
15/5-12 for 5 -12mm joints

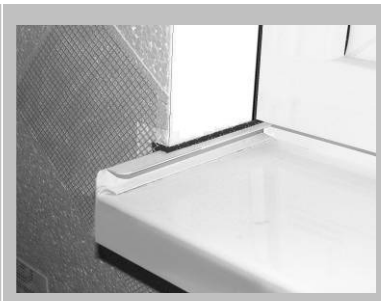
Joint seal band

Joint seal band is an expanding sticky back expanding band fitted in a compressed state to provide effective water tightness.

Note: Caulking compounds and mastic fillers cannot be substituted for joint seal band. Over time they can lose their elasticity, become brittle and require subsequent maintenance and/or renewal.

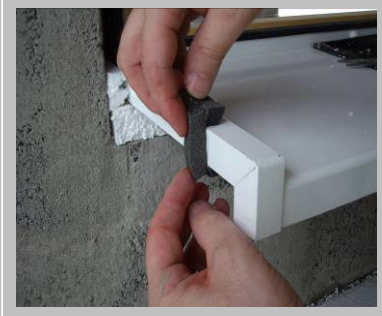
Fitting the joint seal band

- **The seal band should sit flush or in (max. 3mm) from the face of the insulation board.**
- **Do not go around the corners of an element as this will prevent the band from expanding in these areas.**
- **Joint seal band off cuts can be butted together.**



Step 1 **Clean the building element to ensure the joint seal band will stick.**

Step 2 When finished the facade insulation boards should carry past window reveal and sit 5 – 10mm in from the inside edge of the sill up-stand to accommodate the angle bead edge by at the least the planned thickness of the reveal insulation (min. 30mm).



Step 3 Carefully position the band onto the element taking care not to stretch it.

Step 4 **Only apply enough band required as it will expand quickly once off the roll. Fully expanded ban will be more difficult too compress later.**

Step 5 Band is also required under the sill, and must sit flush with the board surface.

Step 6 The Expander ban is there to waterproof the junctions between the board and solid objects and it therefore must be fitted tightly..

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Mechanical fixing

General

Constructive fixing – for background which do not provide enough pull off resistance.

Supplementary mechanical fixing is required where a purely bonded system is deemed unsuitable. This generally applies to buildings higher than 2.5 storey.
Pull off tests (adhesive mortar + reinforcing mesh) should always be carried out on buildings with rendered walls.
Factors determining the type and number of fixing anchors include the building design, location, substrate material and condition.

Number of fixing anchors

- A minimum number of fixing is required in all cases. Fixings must be placed at ***400mm Centers (approx) at all openings; (windows doors) and external corners.***
- Additional fixings may also be required if the building is located in areas high wind exposure
- Tall buildings will need to be individually assessed by the designer, architect or installer to confirm the required number.

Plinth and splash zone

Perimeter and plinth insulation boards must be mechanically fixed at 300 mm above the finished ground level (splash zone).

Selecting the anchors

Only Baumit system approved plastic fixing anchors may be used. These are either screw type or hammer drive anchors. The table below is a guide to the selecting the right type fixing anchor for each substrate material type. Pull out tests should always be carried out on rendered or unidentified substrates before final specification.

Anchor selection							
		Material categories					
Anchor type	Anchoring depth 1)	A	B	C	D	E	Timber back-grounds, gypsum fibre boards
		Concrete	Solid masonry units	Hollow and perforated masonry units	Lightweight concrete	Air-crete	
Klebe Anker RED	40 mm	•	•	•			
Kleb Anker Beton BLUE	40 mm	•					
Anchorl SD 8	35 mm	•	•		•		
Anchor SD-FV	40 mm	•	•				
Anchor NTK U	40 mm	•	•				
Anchor D-FV T	70 mm	•	•	•	•	•	
Universal Anchor STR U 2)	25 / 65 mm 3)	•	•	•	•	•	
HolzDübel 6H	25 mm						•

1) Anchoring into the structural substrate. Into the concrete core of cladded concrete.
2) A minimum insulation board thickness of 80 mm is required when countersinking the Universal Anchor STR U. Baumit Universal Anchor STR U can also be used as a surface fixing with an STR U insulation plug inserted into the STR U shaft.
3) The fixing anchorage depth into air-crete is min. 65 mm

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Anchor lengths

The required pull out resistance will only be achieved with the specified length.

Calculating the required anchor length:
anchoring depth + (existing render) + adhesive mortar thickness + insulation thickness.

Drilling the bore hole

The adhesive mortar must be sufficiently hard before installing supplementary mechanical fixing. The drill bit should be the same thickness as the anchor shaft. The power drill hammer action should not be used when boring into hollow or perforated masonry. Care must be taken not to damage the reinforcing mesh in the render base coat. The drilling depth should be 10 -15 mm longer than the anchor.

Installing the fixing anchors

The fixing anchor must be secure. Remove and replace unsecured fixing anchors. Plug any holes with insulation material.

Fixing anchors may sit flush with the insulation board surface or be countersunk into the insulation material.

Note: Anchors should be fitted into substrate temperatures ≥ 0 ° C.

Polyethylene anchors should not be left exposed to direct sunlight (ultra violet rays) for longer than 6 weeks.

Rondelle – Insulating plugs and caps for anchors

The Rondelle insulating plugs and caps reduce the thermal bridging caused by supplementary mechanical fixing.

Anchors sitting flush:
Action

- Drill the bore hole
- Insert the anchor
- Slot the power drill screw bit into the anchor screw head, turn on the power and screw in the anchor, slightly compressing the insulation material until the anchor head sits flush with the board surface.
- Withdraw the power drill with a slight twisting action to the left.
- Insert the Rondelle insulating plug into the anchor screw shaft.

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Countersinking the anchors

General Guide:

The STR U fixing kit countersinks the fixing anchors into the insulation board. It combines a screw bit, a hole saw blade and a stop plate and is mounted onto a standard power drill. As the power drill is turned on the hole saw blades cuts into the insulation material immediately behind the anchor head. The screw action sinks the anchor into the insulation. The stop plate prevents the anchor from being fixed too deep.

Action

- Drill the bore hole.
- Insert the anchor.
- Slot the power drill screw bit into the anchor screw head, turn on the power and screw in until the depth plate touches the insulation board surface.
- Withdraw the power drill with a slight twisting action to the left.
- Insert the Rondelle insulating plug into the anchor screw shaft.

- Inserion the Rondelle insulating cap over the fixing anchor head.

For a detail description of this procedure see section on STR U Fixings.

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STR-U Counter sunk and capped fixings.

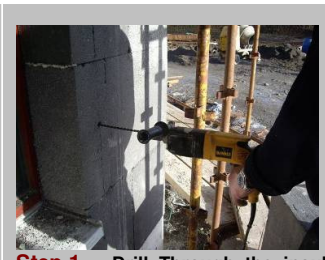
STU Fixings are required when additional mechanical fixing is required.

Products

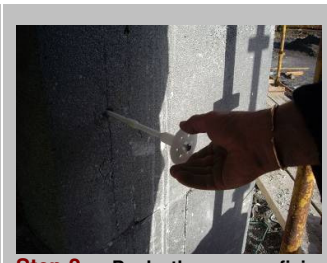
STR-U fixings.
STR-U Plugs.
STR-Capping (insulation).
STR-U drill attachment.

Avantages

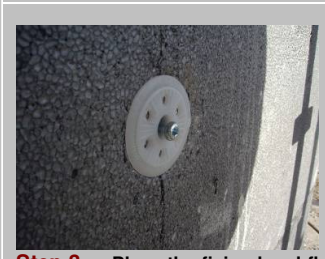
- Gives additional mechanical support.
- Reduced thermal bridging.



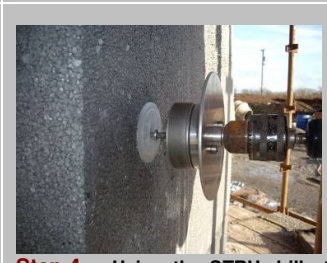
Step 1 **Drill Through the insulation and into the wall approx 75mm into background.**



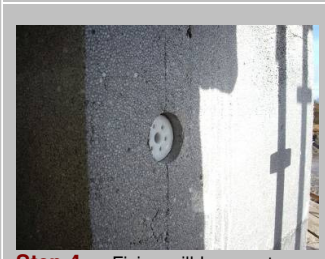
Step 2 **Push the screw fixing through into the bore hole.**



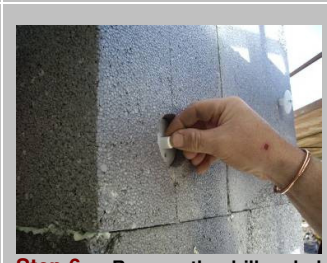
Step 3 **Place the fixing head flush on the surface.**



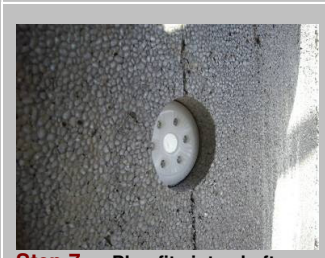
Step 4 **Using the STRU drill attachment placed on the head of the fixing, drill the fixing into place.**



Step 4 Fixing will be counter sunk to 15mm when the drill locks.

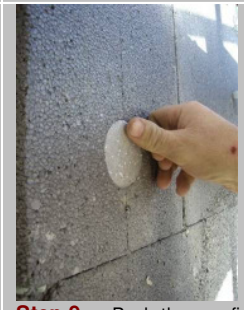


Step 6 **Remove the drill and place a STR U plug into the shaft void so stop thermal bridging.**



Step 7 **Plug fits into shaft.**

Step 8 Place cap on to the head of the fixing, push in.



Step 9 Push the cap firmly home until level with the surface.

Step 10 Job Done.

Step by step ...

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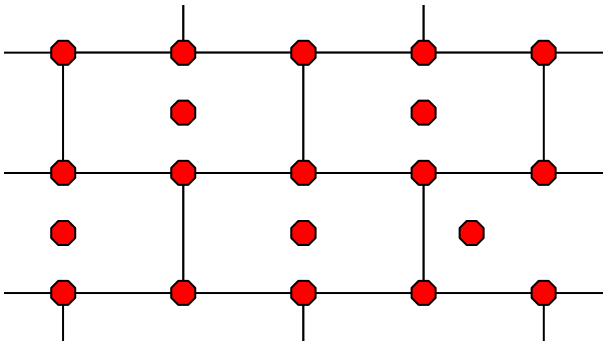
Mechanical fixing patterns

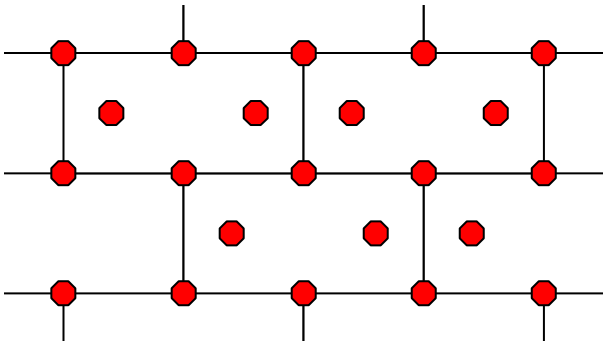
Fixing patterns

The fixing anchors are placed at each corner and T-joints of the insulation boards with one anchor in the middle of each board (6 anchors /m²) or two evenly spaced through the horizontal middle line (8 anchors /m²).

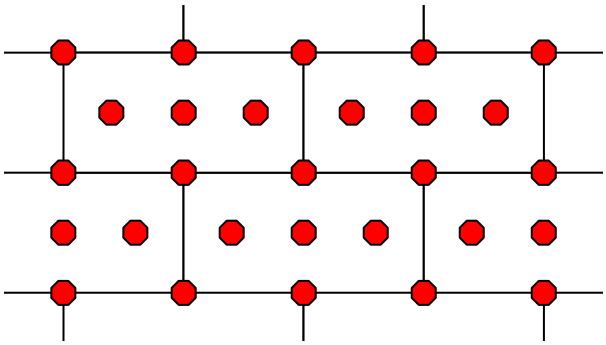
The anchors should line up with the adhesive mortar dots and strips behind the insulation board.



6 fixing anchors /m²



8 fixing anchors /m²



10 fixing anchors /m²

Step by step ...

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Additional reinforcement

Additional reinforcement.

Openings create a weak point in a structure and the resulting stresses may cause render to crack. These areas require additional reinforcement over the corners of the openings, and around the internal corners of walls and reveals.

- **Additional reinforcement mesh and profiles generally sit tight on the surface of the insulation so as not to compromise the bender base coat reinforcement layer.**

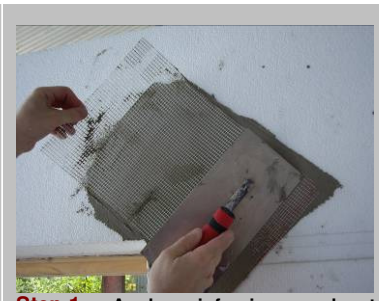
Components
Baumit Bonding Mortar
Baumit Reinforcement mesh
Baumit Reinforcement mesh

Beading corners, edges and additional reinforcement.

Components
Baumit Bonding Mortar
Baumit Reinforcement mesh
Baumit PVC angle bead
Baumit PVC stop bead
Baumit PVC drip bead
Baumit V movement profile
Baumit E movement profile

Beads for corners, edges, drips and render stops all have glass fibre mesh strips attached which must bind in with the reinforcing mesh in the render base coat

- **Beads and profiles must sit level and true in a full bed of Bonding Mortar.**
- **Angle beads must be set in line with the base coat render depth.**
- **Angle beads will be completely covered with the base coat render.**



Step 1 Apply reinforcing mesh strips (min. 250 x 250mm) diagonally across the opening corners into a tight coat of bonding mortar.

Step 2 Smooth out flat.

Fig 3 Apply additional reinforcement mesh around internal corner of head and reveal in a tight coat of bonding mortar.

Fig 4 Apply additional reinforcing mesh (min. 200mm wide) around internal corners in a tight coat of bonding mortar

Step 5 Apply a full bed of mortar approx 150mm wide and comb through with a notched trowel to set the depth for the angle bead.

Step 6 Place the angle bead in position level and smooth out the mesh.

Step by step ...

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Base coat

The reinforced render base coat protects the insulation boards to ensure long term durability and performance of the EWI system. It must successfully resist impact loading, hygro- thermal shock and water penetration.

Components

Baumit Bonding Mortar
Baumit Reinforcing mesh Standard
Baumit Reinforcing mesh Panzer

Background

Before applying the base coat!

- ***The insulation layer must be stable, dry and free of dust, dirt or loose materials.***
- ***The insulation layer must be flat***
- There should be no damage or unfilled gaps in the insulation.
- All sealing details should be completed.

Fixing anchor heads must sit flush with the board surfaces.

Base coat and reinforcement

- The base coat must have a uniform thickness throughout.
- The reinforcing mesh must lie flat in the top third of the base coat thickness
- An overlap of min. 100mm is required between adjoining mesh sheets and mesh strips on beading.
- ***Additional reinforcement under the is required over openings, and around the internal corners of walls and reveals***
- ***Openings create a weak point in a structure and the resulting stresses may cause render to crack.***
- ***Certain areas will require additional reinforcement under the base coat.***
- ***Lay the reinforcing mesh sheets onto the mortar and lightly trowel over the surface from the middle outwards to avoid creasing.***
- ***Apply a little more material as necessary to cover the mesh leaving it just under the surface.***

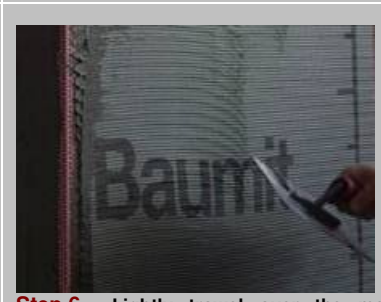
Step 1 **Apply reinforcing mesh strips (min. 250 x 250mm) diagonally across the opening corners into a tight coat of bonding mortar.**

Step 2 **Apply additional reinforcing mesh (min. 200mm wide) around internal corners in a tight coat of bonding mortar.**

Step 3 **Spray or hand apply the bonding mortar over the surface and smooth out with a trowel or plastering rule.**

Step 4 **Comb through the mortar with a notched trowel to set a uniform depth of thickness.**

Step 5 **Starting 30mm in from the corner edge of the angle bead, lay the mesh sheet lightly onto the mortar.**



Step 6 **Lightly trowel over the mesh surface from the middle outwards to avoid creasing.**

Step 7 **Press the edge of the mesh sheet a little deeper into the mortar with the tip of the trowel.**

Step 8 **Overlap the next mesh sheet (min. 100 mm) onto the edge and lightly smooth out with the trowel.** Then apply a little more material as necessary to cover the mesh leaving it just under the surface.

Step by step ...

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Beading and Reinforcement

The reinforced render base coat protects the insulation boards to ensure long term durability and performance of the EWI system. It must successfully resist impact loading, hygro- thermal shock and water penetration.

Components

Baumit Bonding Mortar
Baumit PVC angle bead
Baumit PVC stop bead
Baumit PVC drip bead
Baumit V movement profile
Baumit E movement profile

Beading corners and edges

Beads for corners, edges, drips and render stops all have glass fibre mesh strips attached which must bind in with the reinforcing mesh in the render base coat

- **Beading work must be completed before applying the render base coat.**
- **The beads will only stick to a clean dry surface, so it is important to clean the frames before sticking the bead.**
- **Beads and profiles must sit level and true in a full bed of Bonding Mortar.**
- **Angle beads must be set in line with the base coat render depth.**
- **Angle beads will be completely covered with the finish coat render.**

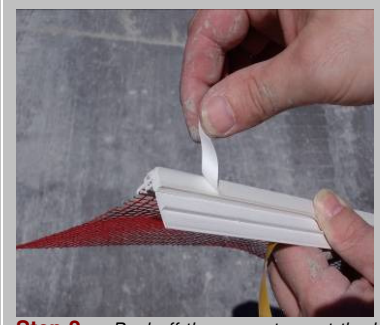
Window seal beads

Window sealing beads provide a flexible, watertight connection between the render system and the window frame. The beads have a removable rigid strip to protect the window frame from trowel scratches.

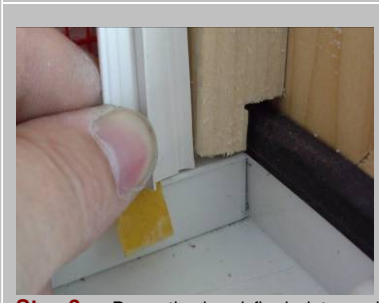
Components

Sealing Bead "Standard"
Sealing Bead "Teleskop"
Sealing Bead "Plus"
Sealing Bead "Flexibel"

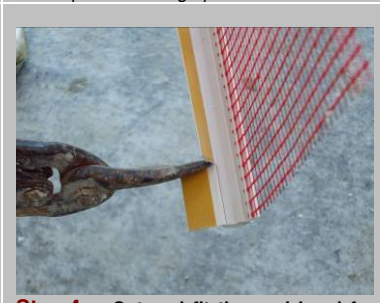
Fig.1 **Measure and cut the seal beads for the vertical reveals first.**



Step 2 *Peel off the paper tape at the back of the bead and press the bead firmly into position, starting on the inside edge of the sill end cap and working upwards.*



Step 3 Press the bead firmly into position, starting on the inside edge of the sill end cap and working upwards and repeat for the window real head.



Step 4 **Cut and fit the seal bead for the head of the window frame.**

Step 5 **Peel off all the yellow paper tape from the protection strip to expose the sticky surface to allow the application of polythene sheet to protect the window from mortar splashes.**

Step 6 **After the rendering is completed pierce the protection strip with a knife and peel it away.**

Step by step ...

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14. Finish render coat

14.1 General
14.2 Notes
14.3 Applying a primer coat
14.4 General-Finish coat renders.
14.5 Coverage Rates
14.6 Mixing and Application
14.7 Coat Thickness
14.8 Finishing
14.9 Finishes Options
14.10 Weather conditions

14.1 General

Finish coat renders provide a decorative finish to EWI systems. They are usually ready mixed in tubs in a range of textures, aggregate sizes and colour.

Components
Baumit UniversalGrund

Pasty Materials:
Baumit GranoporPutze,
Baumit SilikatPutze,
Baumit SilikonPutze,
Baumit NanoporPutze
Baumit ArtlinePutze
Mineral (dry powder) Materials:
SEP 02/04
EST 02/04
MRP

14.2 Notes

Dry powder mineral based finish renders can also be used but should receive a coat of Baumit Silikon Paint.

Background must be dry and uniform

14.3 Primer

The render base coat should be primed with Baumit DG27 Primer for ready mixed finish renders. This can be applied with a roller or brush and can be diluted with a small amount of water. The primer will equalize background suction which helps to create a uniform finish render coat. The primer can also be colour matched to the finish render where certain textures may expose the render base coat. The Primer should dry for at least 24 hours.

14.4 General

Finish coat renders

Step 1 Mix primer with a whisk

Step 2 Apply the primer over the surface using a brush or Roller. Allow to dry for 24 hours.

Step by step ...

by heat absorption than a darker one.

Only stainless steel tools should be used. Aggregates can scratch metal out from standard trowels and which can later appear as rust stains on the finished façade.

14.5 Coverage Rates

Coverage rate depends on the grain size and this information is on the indivual product data sheet.

14.6 Mixing and Application

The ready mixed finish renders can be hand applied by spray applied with a mortar pump and attachment.

- *Apply the finish render on to the primed base coat and smooth out flat with a trowel to the thickness of the aggregate.*
- *Shortly after texture the finish render with a plastic trowel*

Before applying the finish copat it must be mixes thoroughly with a whisk

During mixing consistency can be adjusted if necessary by adding a small anount of water.

Finish coats can be applied with a stainless steel trowel which will drawn up the grain, or with a suitable fine spraying machine it may besprayed on. Appliy finish accross and down the wall mainitaining a wet edge at all times.

14.7 Coat Thickness

Coat thickness is defined as the grain size if the selected material and it is apoplied to one grain thickness.

i.e 1.5mm Silikon Putz =1.5mm layer thickness.

Several passes of the steel trowel with pressure applied will ensure coat thickness.

14.8 Finishing

This coat is immediatly finished off and after laying with a plastic trowel.

The more the surface is rubbed and structuted the finier the finish will becone due to fine particles being drawn to the surface.

Step 3 Mix pasty finishes with a whisk

Step 4 Apply the finish to 1 grain thickness using a steel trowel.

Step by step ...

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Working in small circlular motion to acheive a uniform finish, two passes are necessary to remove any blemishes.

14.7 Finishes Options

Mineral (dry powder) Materials:
Sep 02/04
EST 02/04
MRP

Notes
Dry powder mineral based finish renders can also be used but should receive a coat of Baumit Silikon Paint.

Mixing as follow:
Place water in the bucket.
Add powder finish coat from the bag.
Mix with a drill whisk.
Remove material from the bucket and apply on the wall with a steel trowel to one grain size.
Several passes of the steel trowel with pressure applied will ensure coat thickness.

Finish with a sponge **float again working in small circlular motion to acheive a uniform finish.**
Depending of texture requires work as necessary. For a rough texture a red open cellelar sponge maybe used.

14.10 Weather conditions

Decorative finish renders are generally thin coat with aggregates sizes ranging from 1 – 3 mm. Exposure to direct sunlight , wind and warm temperatures can rapidly dehydrate the render leading to bond failure and irregular texturing.

The application area should be protected with scaffolding nets or similar.

Step 5 Using a plastic float working in small circular motions texture the surface to a uniform finish.

Step 6 Protect the newly rendered façade until set and dry, this will be 2-3 days approx in normal weather conditions.

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