ROXSULATION® PRO SYSTEM

An Exterior Wall Insulation and Finish System

DUK 961

Roxsulation® Pro System
Application Instructions

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SYSTEM APPROVALS

The Dryvit Roxsulation® Pro System is the subject third-party certification and approval schemes from the UK and Europe's leading Certification and Approval bodies.

Our comprehensive portfolio of testing and approvals provide users, architects, specifiers and building control additional reassurance and peace of mind and confirms that the system is fit for purpose and provides a durable construction solution.

BBA approval

BBA Certificate 98/3548 – Dryvit External Wall Insulation Systems - Dryvit Roxsulation® Pro External Wall Insulation Systems – Product Sheet 9 Dual Density Stone Wool and Product Sheet 10 Lamella Stone Wool.

ETA approvals

European Technical Approval (ETA) Certificates from ICiMB ETA-18/0944 Dryvit Roxsulation® Pro System

The components use in the Dryvit Roxsulation® Pro External Wall Insulation System are highlighted in the table below. For further details on the full scope of these approvals contact Dryvit UK Ltd.

LIST OF DRYVIT BROCHURES AND PUBLICATIONS REFERENCED IN THIS DOCUMENT

Product type	Product name	Data sheet reference
Adhesive	Roxhesive	DS EN 04 50 08
	Genesis DM Plus	DS EN 04 50 15
Adhesive and Base coat	Fibercoat	DS EN 04 50 17
Reinforcing Mesh	Standard	DS EN 04 56 01
	Standard Plus 150	
	Standard Plus 160	
	Panzer 260	
	Panzer 500	
	Panzer 700	
	Detail mesh	
Key coats/Primers	Color Prime Plus	DS EN 04 51 07
	Demandit Smooth	DS EN 05 54 02
	Wood Prime	DS EN 04 51 08
Standard Finishes	Drytex	DS EN 04 53 01
	PMR	DS EN 04 52 08
	TR	DS EN 04 52 05
	HDP	DS EN 04 52 11
	Hybrid	DS EN 04 52 18
Speciality finishes	Ameristone(1)	DS EN 04 52 01
	TerraNeo(1)	DS EN 04 52 02
	Stone Mist(1)	DS EN 04 52 03
	Stone Mist T(1)	DS EN 04 52 04
	Custom Brick(1)	DS EN 04 52 15
	Drytex Wood Effect	DS EN 04 53 03
Decorative coatings	Demandit Smooth	DS EN 04 54 02
	Silstar/Silstar Pro	DS EN 04 54 04
	HyDroPhobic	DS EN 04 54 20
	Wood Glaze	DS EN 04 54 07
Insulation	Stone Wool Dual Density	DS EN 04 56 08.1
	Stone Wool Lamella	DS EN 04 56 08.3

(1) Can be applied by pattern to form a Custom Brick Effect

Standard finishes and textures

Finish	Texture[1]								
	SB	QPF	QP	LS	FS	SPF	SP	SP2	SP3
Drytex	✓	✓	✓		✓		✓	✓	✓
PMR	✓		✓	✓	✓	✓	✓	✓	
TR	✓		✓	✓	✓	✓	✓	✓	
HDP							✓		
Hybrid	✓	✓		✓	✓	✓	✓	✓	

(1) Texture options to give an A2-s1, d0 Classification

Texture		Size (mm)	Texture		Size (mm)
Sandblast (SB)		1.2	Sandpebble Fine (SPF)		1.2
Quarzputz Fine (QPF)		1.2	Sandpebble (SP)		1.6
Quarzputz (QP)		2.0	Sandpebble 2 (SP2)		2.0
Lymestone (LS)		0.6	Sandpebble 3 (SP3)		3.0
Freestyle (FS)		0.6			

Guide for Primers and Finishes

Finish	Color Prime Plus	Demandit Smooth(1)	Wood Prime
PMR	✓		
TR	✓		
HDP	✓		
Hybrid	✓		
Ameristone(1)	✓	✓	
TerraNeo(1)	✓	✓	
Stone Mist(1)	✓	✓	
Stone Mist T(1)	✓	✓	
Custom Brick (1)	✓	✓	
Drytex Wood Effect			✓

(1) Demandit Smooth is used under the highlighted products to form the coloured joints as part of the Dryvit Custom Brick Effect

Product type	Product name	Data sheet reference
Ancillary items	FF197 Expanding Foam	Available on request
	Starter Track and connectors	
	Render Beads	
	Corner Bead with Mesh	
	Compressible Seals and Frame Seal Beads	
	Fungicidal Wash	
	Efflorescence Remover	
	Mechanical Fixings	To suit substrate type and wind loads
Dryvit reference documents	Dryvit Information Sheets	DIS Series
	Technical Guidance Notes	GN Series
	Details for solid substrates	DUK 965

1. General installation requirements

Project conditions

1.1 Health and safety

- Always wear appropriate PPE for the task undertaken including the use of suitable protective clothing, dust mask and eye protection where specified.
- Refer to individual product Safety Data Sheets (SDS) for full information.
- When handling Stone Wool insulation, suitable gloves should always be worn. In addition, when cutting, drilling or rasping Stone Wool insulation goggles and an FFP1 type dust mask should be worn and any exposed skin covered. Goggles should always be worn when handling Stone Wool above shoulder height.

1.2 Storage

- All products should be stored in a cool dry location, off the ground, in sealed packaging and protected at all times from rain or water exposure.
- Products should be stored away from prolonged expose to direct sunlight.
- Maximum storage temperature shall not exceed 38°C. Minimum storage temperature shall not be less than 5°C. except for the following products:

Product	Minimum storage temperature (°C)
Demandit Smooth	7°C
Ameristone, TerraNeo and Lymestone	10°C

- Stone Wool insulation must be stored in a dry place and not be exposed to water.
- Refer to individual product data sheets for full storage information.

1.3 Application

- Application of wet materials shall not take place during inclement weather unless appropriate protection is provided.
- All materials shall be protected from inclement weather until they are completely dry.
- Stone Wool insulation must never be left to prolonged exposure to rain and water. If the insulation becomes wet, it must be left to fully dry prior to installing the base coat.
- Before application of Dryvit products, the air and surface temperatures must be 5°C or above and must remain so for a minimum of 24 hours or until the product is dry, except for the following products:

Product	Minimum air and surface temperature (°C)
FD PMR	1°C
Demandit Smooth, Demandit Sanded, Stone Mist and Stone Mist T	7°C
Ameristone, TerraNeo and Lymestone	10°C

- These temperatures shall be maintained with adequate air ventilation and circulation for a minimum of 24 hours (48 hours for Ameristone, TerraNeo and Lymestone) or until the products are completely dry.
- Cool or humid conditions may extend the required drying time.
- Refer to individual product data sheets for full application information.

1.4 Inspection of substrate

- The system is suitable for use on solid constructions. Common substrates include, in-situ concrete, pre-cast concrete, blockwork, brick, render, no-fines concrete, exposed aggregate panels. Dryvit UK should be consulted for further information on acceptable substrates.
- The substrate must be clean, dry, structurally sound, free of loose material, voids, projections, hot spots, release agents, coatings, or other materials that may affect adhesion.
- There shall be no planar irregularities greater than 12 mm within any 3 m radius. On solid substrates any irregularities over this limit will require re-profiling using Stucco Build. Further guidance on planar irregularities for solid and sheathing is provided in the table in Section 5, Table 1.

1.5 Flashing at system terminations

- Ensure that all flashings, sills and trim are installed in accordance with the manufacturer's installation requirements and the contract documents.
- Refer to the Dryvit Roxsulation® Pro System Installation Details for further information and guidance on all standard system details.

1.7 Transition at roof lines

- Ensure the roof has positive drainage, i.e. all runoff shall be directed to the exterior and away from the structure.
- Roof flashing shall be installed in accordance with industry guidelines, manufacturer's instructions and contract documents.
- Runoff diverters shall be installed in accordance with industry guidelines, manufacturer's instructions and contract documents. Attention must be paid to the eaves/chimney intersections and sloped roof/wall intersections.
- Hold the system a minimum of 150 mm above flat roofs.

1.8 Openings

- Continuous flashing at heads of openings are specified and installed as indicated in the contract documents and Dryvit Roxsulation® Pro System Installation Details.
- For windows or doors that do not have integral flashing, a field-applied flashing shall be installed in accordance with industry guidelines, manufacturer's instructions and contract documents.
- Individual windows that are ganged to make multiple units require that the heads be continuously flashed and the joints between the units are fully sealed.
- •In accordance with the recommendations given in BS EN 13914-1 *Design, preparation and application of external rendering and internal plastering. External rendering*, sills and flashings should project beyond the face of the rendered system by a minimum 40 mm.

1.9 Roof junctions and decks

- Where the system terminates above poured decks, patios, landings, etc. they must be properly sloped and waterproofed to direct water away from the walls.

1.10 Utilities

- Provisions must be made to ensure that the system terminates properly at lighting fixtures, electrical outlets, hose bibs, dryer vents, satellite dishes etc.
- It is the responsibility of the client/main contractor to assess existing extract ducts and extend the flues. Any works to boilers should be carried out by a registered Gas Safe engineer.

1.11 Grade level terminations

- The system shall be terminated a minimum of 150 mm above finished grade. Refer to the Dryvit Roxsulation® Pro System Installation Details for above and below grade termination guidance.

1.12 Sealants/seals

- Dryvit materials shall be completely dry prior to installation of sealant materials (typically 48 to 72 hours). Humid or cool conditions may further extend drying times.
- For compressible weather seals refer to the manufacturer's installation instructions.
- Substrate to receive frame seals should be free of contamination and installed in accordance with manufacturers installation instructions.

1.13 Wind loading

- Dryvit UK Ltd are responsible for the design of the EWI cladding system and the design of its attachment to the wall.
- Prior to system installation, the maximum design wind pressure (load) for the structure must be verified in accordance with national regulations and requirements. Dryvit UK Ltd will undertake fixing pull out and/or pull-off tests and undertake a wind loading assessment in accordance with BS EN 1991-1-4 or alternatively if wind loadings are supplied by a third-party engineer, will use these wind loads to verify the adequacy of the fixing design. Based on these calculations, the method of fixing and the required fixing pattern can be determined. The fixing recommendations require approval from the Design Engineer before the commencement of the installation.
- Dryvit UK Ltd will also provide information on the system dead weights to allow an independent check of the existing substrate wall by the clients engineer.
- The Main Contractor and/or Architect and/or Owner must be notified the of any discrepancies from the approved method. Installation shall not proceed until any unsatisfactory conditions are corrected.
- Under the Building Regulations Approved Document A – Structure, there is an obligation placed on the client such that they must provide supporting evidence as part of the Building Regulations application to justify that the building is capable of transferring dead, imposed and wind loads to the ground safely allowing for any additional loadings that are imparted to the structure as a result of the new EWI system being applied. This structural check does not form part of the Dryvit UK Ltd's scope of works and therefore the client should appoint a suitably qualified structural engineer to be responsible for the global stability of the building and ensure that this assessment is included within the building regulation application.
- Dryvit UK Ltd will not accept any responsibility for any failure caused to the EWI system as a result of any failures in supporting structure and foundations however it is caused.

2 Materials required for the installation of the Roxsulation® Pro System

2.1 Materials supplied by Dryvit UK Ltd.

The project specification will identify the project specific materials necessary to complete the application of the system.

- Starter track, termination, movement joints and corner beads etc.
- Dryvit Adhesive – where specified
- Stone wool Dual Density or Lamella meeting the requirements of EN 13162, Euroclass A1.
- Dryvit Expanding Foam: FF197 fire retardant expanding foam.
- Dryvit Base coat.
- Dryvit Reinforcing Mesh.
- Dryvit Primer – where specified
- Dryvit Finishes
- Dryvit Decorative Coating – where specified
- Fasteners to suit the insulation, substrate type and wind loads
- Compressible seal and window frame seal beads – where specified.

2.2 Materials supplied by others

- Clean potable water
- Joint sealant and closed cell backer rods
- Compressible polyurethane joint sealing tape – Contact Dryvit for information.

3 Mixing Instructions

- All materials must be mixed and installed in accordance with the instructions given on the relevant product data sheet.
- Under no circumstances shall, additives such as sand, aggregates, rapid binders, anti-freeze, accelerators, etc. be added to any Dryvit materials. Such additives will adversely affect the performance of the material and void all warranties.
- Due to shipping and storage, there may be some separation of bucket materials. Prior to use, remix the material thoroughly using a Dryvit recommended mixing paddle, powered by a slow speed drill.
- Buckets should be opened using a utility knife or Dryvit Bucket Opener.

4 Preparation of openings, joint bridging and sheathing board jointing

4.1 Preparation of openings.

- Consideration must be given as to whether the Roxsulation® Pro System is being installed with existing or new windows in either a setback or set forward position. Please refer to Dryvit Roxsulation® Pro standard details for further guidance.

4.2 Preparation of rough openings (where specified)

- All flashing shall be continuous, have watertight seams, and shall be configured to shed all water to the exterior of the system.
- Flashing, sills and trims shall overhang the surface of the Roxsulation® Pro System a minimum of 40 mm.

5 Insulation board installation - adhesive and mechanical fix

5.1 System terminations – with back wraps (if specified)

- Back wraps are only required when specified, alternatively terminations and joints are formed with tracks, seals and beads.
- Attach Detail mesh around the perimeter of all openings, penetrations, expansion joints and other system terminations by applying a ribbon of adhesive mixture on the substrate and embedding the Detail mesh into the wet mixture.
- Position the Detail mesh so that a minimum of 65 mm is left to extend onto the insulation board. Keep the mesh, which is not embedded, clean.
- Ensure the mesh is of sufficient width to wrap around the thickness of the board and create a minimum 65 mm overlap with the main mesh. If the width of the mesh required exceeds the width of the Detail mesh, Standard Plus 150 mesh can be cut to the required dimensions.

5.2 Inspection of the insulation board

- Prior to installing the insulation board, it shall be checked to ensure that it is Dryvit Stone Wool Slab, Dual Density or Lamella conforming to EN 13162, Euroclass A1.
- Dryvit Stone Wool Slab and Dual Density are supplied in a dimensions 1.2 m x 0.6 m by the specified thickness
- Lamella is available in dimensions 1.0 m x 0.2 m by the specified thickness.
- All insulation must be supplied from Dryvit UK Ltd.
- Any insulation board not meeting the above requirements shall be rejected and not installed.

5.3 Applying Dryvit cementitious adhesives

- The adhesive is applied either using the ribbon and dab or notched trowel method of application. The selected method will depend on the substrate and project requirement. Guidance on selecting the most appropriate application method is given in Table 1 below.
- For Lamella the adhesive is applied with a notched trowel.
- The adhesive must be applied to the board, do not install adhesive mixture on the substrate.

Table 1 – Substrate tolerance

Substrate out-of-plane tolerance in 3 metres	Application method	Fixing method
0 mm to ± 3 mm (Total 6 mm)	Ribbon and dabs	Using a stainless-steel trowel, install a ribbon of the adhesive mixture 50 mm wide by 10 mm thick around the entire perimeter of the insulation board. Place eight dabs of the adhesive mixture 10 mm thick by 100 mm in diameter, at approximately 200 mm centres, to the interior area of the insulation board to achieve a minimum 40% contact area when the board is pressed back to the substrate. See Figure 1.
	Notched trowel	Use a notched trowel, with 10 mm wide and 13 mm deep notches spaced at 45 mm centres. Apply the adhesive mixture to the reverse side of the insulation board. Holding the trowel at a 45° angle, apply firm pressure to the insulation board to scrape the excess adhesive from between the adhesive beads and create a minimum 40% contact area when the board is pressed back to the substrate. See Figure 2. The adhesive shall be applied so that the ribbons run vertically when the insulation board is placed on the wall.
± 3 mm to ± 6 mm (Total 6 mm to 12 mm)	Ribbon and dabs	Using a stainless-steel trowel, install a ribbon of the adhesive mixture 50 mm wide by 20 mm thick around the entire perimeter of the insulation board. Place eight dabs of the adhesive mixture 20 mm thick by 100 mm in diameter, at approximately 200 mm centres, to the interior area of the insulation board to achieve a minimum 40% contact area when the board is pressed back to the substrate.
> ± 6 mm	Re-profile the substrate flat with Stucco Build, refer to the product data sheet for further information, then follow the appropriate fixing method as specified in this table.	

Figure 1: Ribbon and dab application pattern

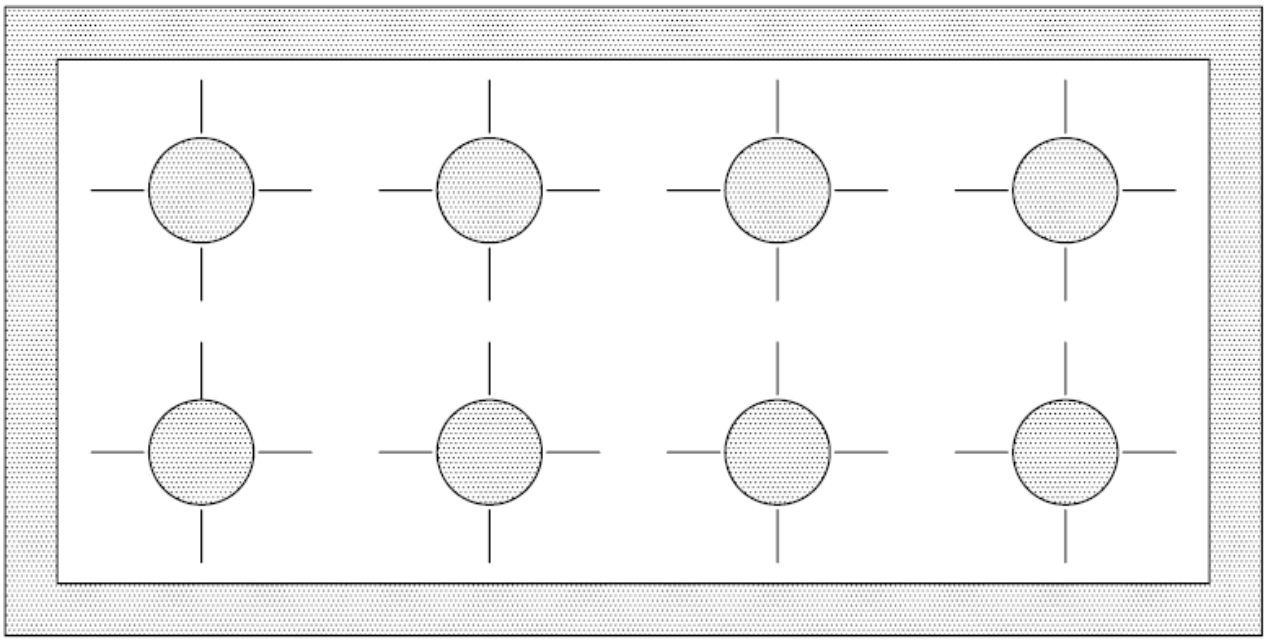
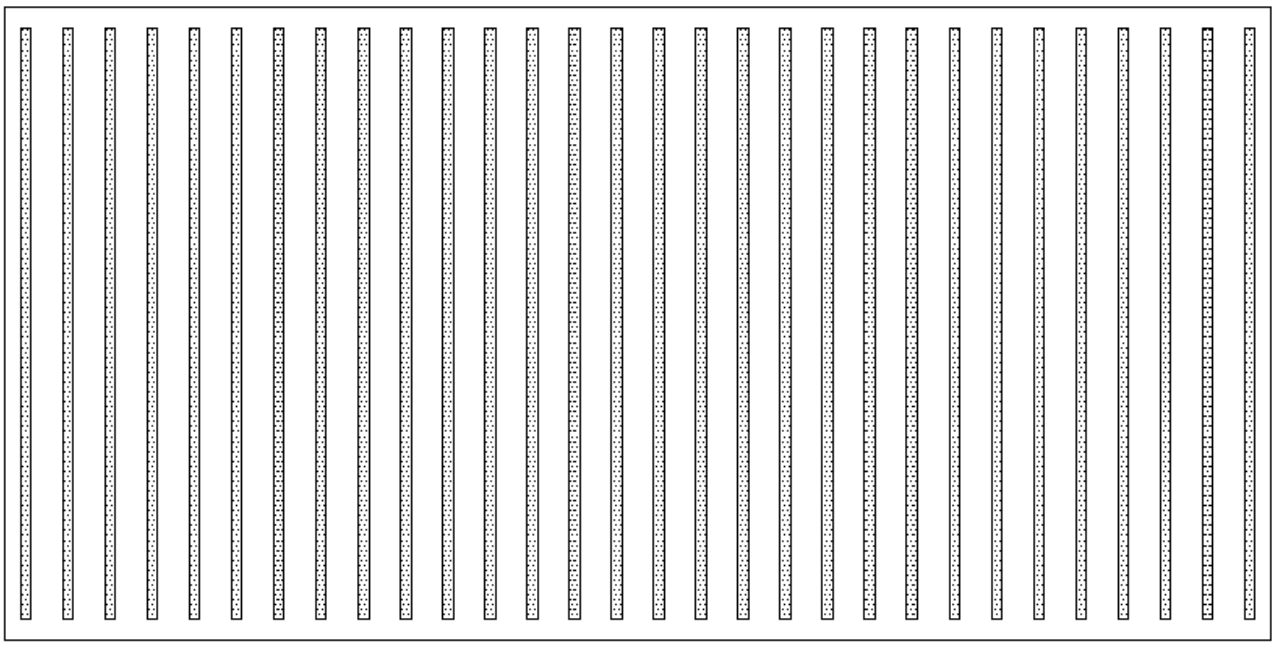


Figure 2: Notched trowel application pattern



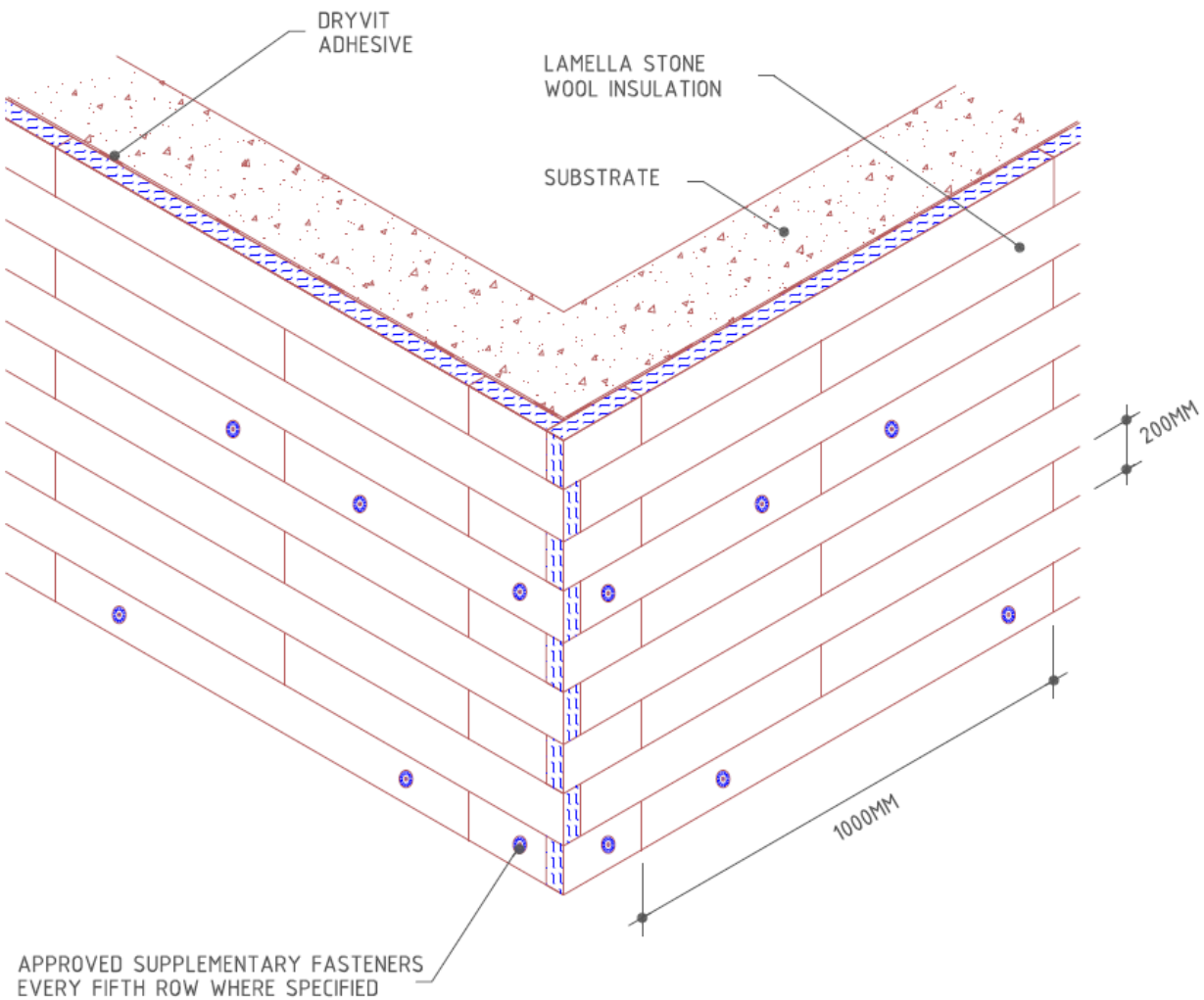
5.4 Dryvit starter track

- Dryvit Starter Track shall be installed above the DPC at the base of the wall. Alternatively, where a Dryvit Starter Track is not specified, the base of the system may be back wrapped as a standard system termination.
- Using a laser level or chalk line, strike a level line at the base of the wall that coincides with either the top or bottom of the upstand leg.
- Position the track on the line and press firmly against the substrate. Secure the track using corrosion resistant fasteners at approximate 300 mm centres attached into the underlying substrate or framing members.
- Fix to suit the substrate type and loading requirements.
- Do not overlap tracks, they shall be butted tightly and jointing clips used to maintain continuity of the track.
- A continuous front drip section at corners can be achieved by cutting the rear upstand leg and base of the track to facilitate bending to the required angle.

5.5 Insulation board installation

- The method of installing and fixing the insulation board will depend of the insulation type, insulation thickness, substrate type and wind loads. Dryvit UK Ltd shall be consulted to confirm the correct method based on project specific information.

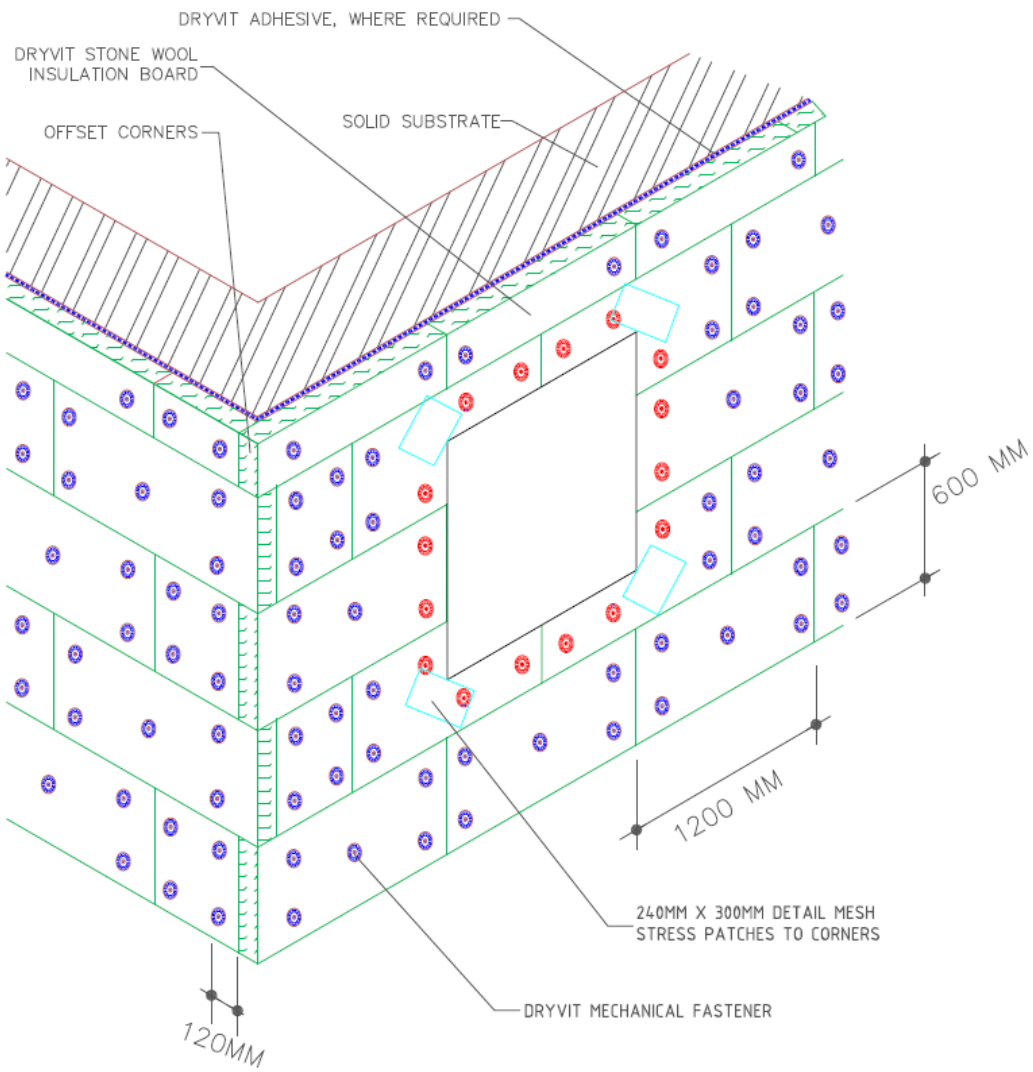
5.5.1 Primary adhesive fix with supplementary fixings – Lamella insulation only



- Surfaces should be clean and free from loose material.
- Where required an adhesion test shall be carried out to confirm a suitable bond is achieved between the adhesive and the substrate.
- The flatness of the surfaces shall be checked using a straight edge spanning the storey height. Excessive irregularities i.e. greater than 12 mm must be made good prior to installation to ensure that the insulation boards are installed onto a smooth in-plane surface.
- If necessary, remove organic growth and brush apply one application of Dryvit Borocal-5Rh fungicidal wash to the entire substrate surface and allow to fully dry.
- It is recommended that rough masonry surfaces are re-profiled with a levelling mortar such as Dryvit Stucco Build prior to installation of the boards, for localised areas the cementitious adhesive may be applied more generously to correct for front face alignment.
- To begin, secure the Dryvit Starter Track or back wrap the insulation at the base of the wall.
- Apply the mixed adhesive on the reverse of the insulation board with a notched trowel and position the board horizontally on the substrate. Press the board gently to the substrate and into position. Apply firm pressure over the entire surface of the insulation board to ensure uniform contact and high initial grab.
- Using a margin trowel, clean the insulation board edges of any excess adhesive. Ensure that the insulation board joints are butted tightly and are level and flush.
- Do not allow adhesive to remain in board joints since material in board joints can result in cracking.
- Install subsequent rows of insulation board in a running bond pattern (vertical joints staggered a minimum of 200 mm).
- With factory edges exposed, stagger vertical joints at inside and outside corners, making sure the corners are straight and plumb.
- At penetrations, align the insulation boards so that the edges (vertical and horizontal joints) do not coincide with the corners of the opening, this will reduce stresses on the base coat.
- Installation in this manner will reduce the potential for cracks to develop
- To ensure an overall flat surface, tamp the entire wall with a board that overlaps six to twelve rows of insulation.
- If for any reason the insulation board joints are not butted tightly, the gaps must be filled.
- All gaps greater than 1.5 mm up to 7 mm are filled with Dryvit FF197 expanding polyurethane foam. The foam is injected into the gap and should penetrate as far back to the substrate as possible. After it cures, the excess is sliced off using a knife or trowel edge prior to rasping. Any material that may come loose during the rasping process must be reapplied and this step repeated.
- Gaps greater than 7 mm are filled with a cut sliver of insulation. To create a tight-fitting sliver, it is recommended that a wider joint be cut before the insulation sliver is fitted. Do not install adhesive on sliver edges.
- Allowing this method of filling gaps between the insulation boards is not intended to take the place of good workmanship and care must be taken to ensure that all insulation boards are abutted as tightly as possible during installation.
- Once the insulation boards are in place, wait a minimum of 24 hours prior to working on the surface of the insulation boards to prevent any movement which may weaken the bond of the adhesive mixture to the substrate.

- The entire wall must be rasped flat to remove any irregularities in the insulation board surface. Use a Dryvit hand help rasp, alternatively electric and air rasps are available. Rasping is accomplished with a light circular motion over the surface of the boards. A fine particle dust respirator must be worn to protect against inhaling particles or dust.
- Ensure with a 2.4 m long straight edge that the surface of the insulation boards is level and flat before the application of the base coat.
- Do not rasp parallel to the board joints.
- Mechanical fixings are installed used every fifth row to provide additional stability until the adhesive cures. Based on the substrate type and thickness of the insulation, Dryvit UK Ltd will advise on the most suitable number, type and length of fixing to be used.
- Use the correct diameter masonry bit and drill a hole through the insulation board into the substrate to the correct fastener embedment depth. Push the fixing body of the fastener through the hole and screw or hammer (as required) the fixing pin into place such that the outer flange of the plate shaped head causes a slight deformation in the insulation and is flush with the board surface. Do not overdrive the fastener, the face of the flange should sit flush to a maximum of 0.5 mm beneath the surface of the insulation board causing a slight dimple at each fastener location.
- After a minimum 24 hours the fixing may either be removed and the hole filled with Dryvit FF197 low expansion foam adhesive or alternatively the fixing may be left in place. Small holes may be filled with Dryvit FF197 expanding foam.
- The base coat shall be applied such that the resulting overall minimum thickness is sufficient to fully embed the reinforcing mesh and cover the fastener heads with a uniform minimum base coat thickness of 3 mm.
- The recommended method is to apply the base coat in two passes.

5.5.2 Primary mechanical fix - Fixings under the mesh



a) Dry fix with no adhesive

- Surfaces should be clean and free from loose material.
- A series of tests should be carried out to determine the resistance to pull-out of the proposed fixings from the substrate.
- The flatness of the surfaces shall be checked, this may be achieved by using a straight edge spanning the storey height. Where excessive irregularities are identified in the substrate the use of supplementary adhesive shall be considered.
- If necessary, remove organic growth and brush apply one application of Dryvit Borocal-5Rh fungicidal wash to the entire substrate surface and allow to fully dry.
- It is recommended that rough masonry surfaces are re-profiled with a levelling mortar such as Dryvit Stucco Build prior to the installation of the insulation boards.
- To begin, secure the Dryvit Starter Track or back wrap the insulation at the base of the wall.
- Based on the substrate type and thickness of the insulation, Dryvit UK Ltd will advise on the number, type and length of fixing to be used.

- Into each full insulation board install the mechanical fixing, in accordance with the project specific Dryvit layout drawings. The fixings should be installed a minimum of 120 mm in from the edge of the board and in from building corners.
- Press the insulation board firmly to the substrate and hold it in position. Use the correct diameter masonry bit and drill a hole through the insulation board into the substrate to the correct fastener embedment depth. Push the fixing body of the fastener through the hole and screw or hammer (as required) the fixing pin into place such that the outer flange of the plate shaped head causes a slight deformation in the insulation and is flush with the board surface. Do not overdrive the fastener, the face of the flange should sit flush to a maximum of 0.5 mm beneath the surface of the insulation board causing a slight dimple at each fastener location.
- If a fixing is overdriven and the local integrity of the insulating board lost, or the board is damaged or torn, a new fixing should be installed in the same proximity. The hole formed by the overdriven fixing should be plugged with a tight-fitting piece of insulating board. Small holes may be filled with Dryvit FF197 expanding foam cut flush with the face of the board.
- Install subsequent rows of insulation boards in a running bond pattern (vertical joints staggered a minimum of 200 mm).
- With factory edges exposed, stagger vertical joints at inside and outside corners, making sure the corners are straight and plumb.
- At penetrations, align the insulation boards so that the edges (vertical and horizontal joints) do not coincide with the corners of the opening, this will reduce stresses on the base coat.
- Installation in this manner will reduce the potential for cracks to develop.
- If for any reason the insulation board joints are not butted tightly, the gaps must be filled.
- All gaps greater than 1.5 mm up to 7 mm are filled with Dryvit FF197 expanding polyurethane foam. The foam is injected into the gap and should penetrate as far back to the substrate as possible. After it cures, the excess is sliced off using a knife or trowel edge flush with the face of the board.
- Gaps greater than 7 mm are filled with a cut sliver of insulation. To create a tight-fitting sliver, it is recommended that a wider joint be cut before the insulation sliver is fitted. Do not install adhesive on sliver edges.
- Allowing this method of filling gaps between the insulation boards is not intended to take the place of good workmanship and care must be taken to ensure that all insulation boards are abutted as tightly as possible during installation.
- Ensure with a 2.4 m long straight edge that the surface of the insulation boards is level and flat before the application of the base coat.
- The base coat shall be applied such that the resulting overall minimum thickness is sufficient to fully embed the reinforcing mesh and cover the fastener heads with a uniform thickness of 3 mm to 5 mm of base coat material.
- The recommended method is to apply the base coat in two passes.

b) With supplementary adhesive

- Surfaces should be clean and free from loose material.
- A series of tests should be carried out to determine the resistance to pull-out of the proposed fixings from the substrate.
- The flatness of the surfaces must be checked, this may be achieved by using straight edge spanning the storey height. Excessive irregularities i.e. greater than 12 mm must be made good prior to installation to ensure that the insulation boards are installed onto a smooth in-plane finished surface.
- If necessary, remove organic growth and brush apply one application of Dryvit Borocal-5Rh fungicidal wash to the entire substrate surface and allow to fully dry.
- It is recommended that rough masonry surfaces are re-profiled with a levelling mortar such as Dryvit Stucco Build prior to board installation, for localised areas the cementitious adhesive may be applied more generously to correct front face alignment.
- To begin, secure the Dryvit Starter Track or back wrap the insulation at the base of the wall.
- Apply the mixed adhesive on the reverse of the insulation board using the ribbon and dab application method and position the board horizontally on the substrate. Press the board gently to the substrate and into position. Apply firm pressure over the entire surface of the insulation board to ensure uniform contact and high initial grab.

Ribbon and dab application of adhesive to the back of the insulation board

- Using a margin trowel, clean the insulation board edges of any adhesive mixture. Ensure that the insulation board joints are butted tightly and are level and flush.

- Do not allow adhesive to remain in board joints since material in board joints can result in cracking.
- To ensure an overall flat surface, tamp the surface of the entire wall with a suitably sized board.
- Based on the substrate type and thickness of the insulation, Dryvit UK Ltd will advise on the number, type and length of fixing to be used.
- Into each full insulation board install the mechanical fixing, in accordance with the project specific Dryvit layout drawings. The fixings should be installed a minimum of 120 mm in from the edge of the board and in from building corners.
- Use the correct diameter masonry bit and drill a hole through the insulation board into the substrate to the correct fastener embedment depth. Push the fixing body of the fastener through the hole and screw or hammer (as required) the fixing pin into place such that the outer flange of the plate shaped head causes a slight deformation in the insulation and is flush with the board surface. Do not overdrive the fastener, the face of the flange should sit flush to a maximum of 0.5 mm beneath the surface of the insulation board causing a slight dimple at each fastener location.
- If a fixing is overdriven and the local integrity of the insulating board lost, or the board is damaged or torn, a new fixing should be installed in the same proximity. The hole formed by the overdriven fixing should be plugged with a tight-fitting piece of insulating board. Small holes may be filled with Dryvit FF197 expanding foam cut flush with the surface of the board.

Hole drilled through the board in to the substrate with a masonry drill of the correct size and embedment depth

Fastener screw tightened with washer slightly indenting in to the surface of the insulation

- Install subsequent rows of insulation boards in a running bond pattern (vertical joints staggered a minimum of 200 mm).

Insulation board pushed back to the substrate with a minimum 200 mm overlap between board joints

Boards installed in a brick bond pattern

- With factory edges exposed, stagger vertical joints at inside and outside corners, making sure the corners are straight and plumb.
- At penetrations, align the insulation boards so that the edges (vertical and horizontal joints) do not coincide with the corners of the opening, this will reduce stresses on the base coat.
- Installation in this manner will reduce the potential for cracks to develop.
- If for any reason the insulation board joints are not butted tightly, the gaps must be filled.
- All gaps greater than 1.5 mm up to 7 mm are filled with Dryvit FF197 expanding polyurethane foam. The foam is injected into the gap and should penetrate as far back to the substrate as possible. After it cures, the excess is sliced off using a knife or trowel edge flush with the face of the board.

Board joints filled with expansive foam

Foam left to cure and cut flush with the board surface

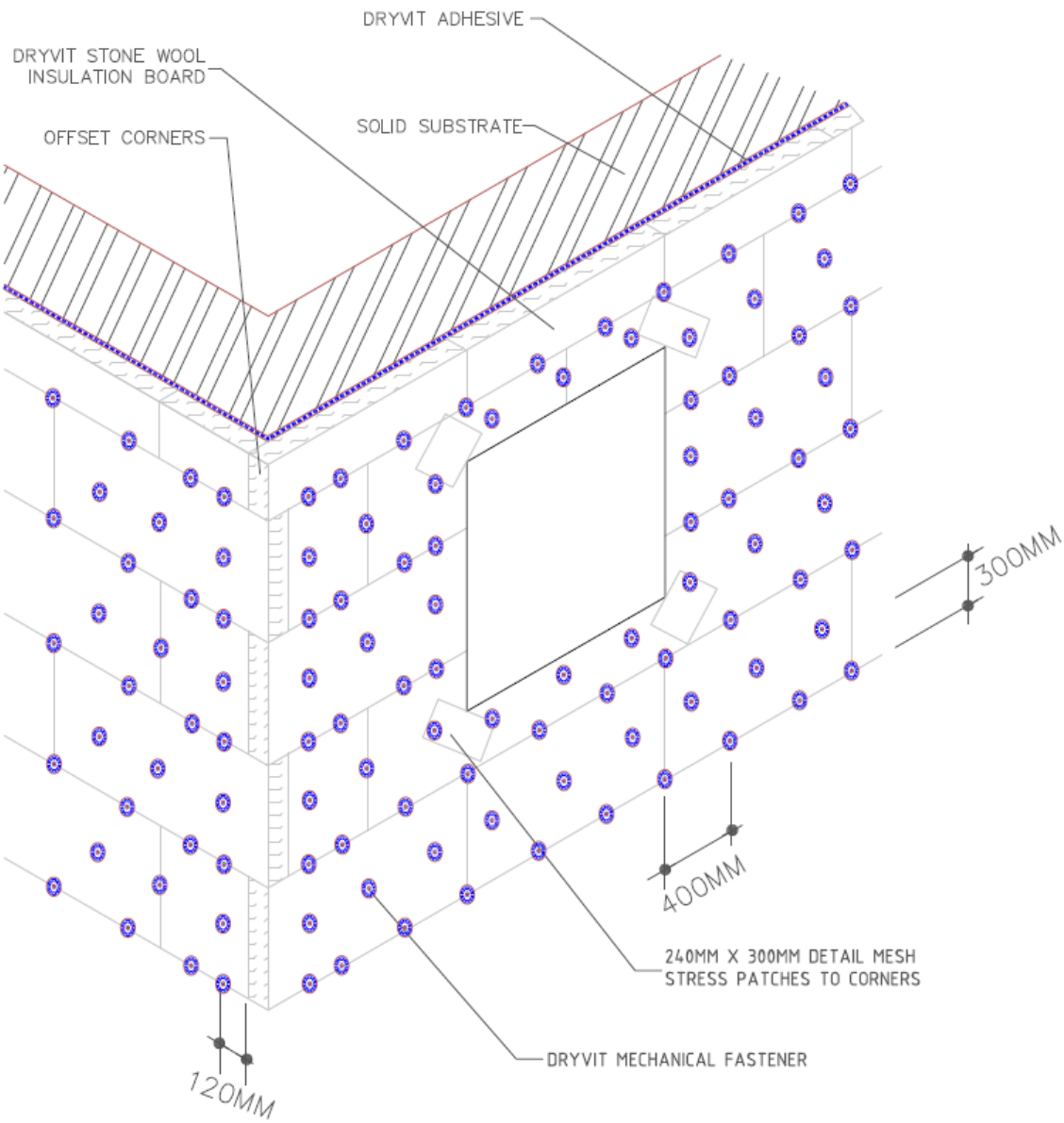
- Gaps greater than 7 mm are filled with a cut sliver of insulation. To create a tight-fitting sliver, it is recommended that a wider joint be cut before the insulation sliver is fitted. Do not install adhesive on sliver edges.
- Allowing this method of filling gaps between the insulation boards is not intended to take the place of good workmanship and care must be taken to ensure that all insulation boards are abutted as tightly as possible during installation.
- Ensure with a 2.4 m long straight edge that the surface of the insulation boards is level and flat before the application of the base coat.

Overview of board installation with filled board joints

Flatness of the installed boards checked using a level or straight edge

- Once the insulation boards are in place, wait a minimum of 24 hours prior to working on the surface of the insulation boards to prevent any movement which may weaken the bond of the adhesive mixture to the substrate.
- The base coat shall be applied such that the resulting overall minimum thickness is sufficient to fully embed the reinforcing mesh and cover the fastener heads with a uniform thickness of 3 mm to 5 mm of base coat material.
- The recommended method is to apply the base coat in two passes.

5.5.3 Primary mechanical fix with supplementary adhesive - Fixings through the mesh



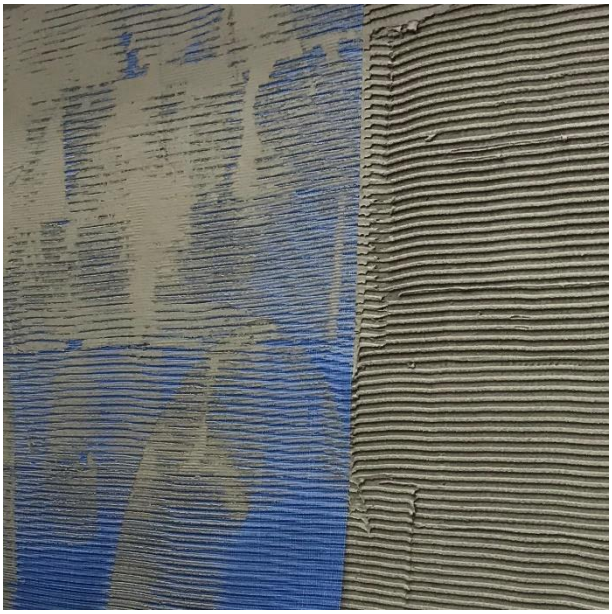
- Surfaces should be clean and free from loose material.
- A series of tests should be carried out to determine the resistance to pull-out of the proposed fixings from the substrate.
- The flatness of the surfaces must be checked, this may be achieved by using a straight edge spanning the storey height. Excessive irregularities i.e. greater than 12 mm must be made good prior to installation to ensure that the insulation boards are installed onto a smooth in-plane finished surface.
- If necessary, remove organic growth and brush apply one application of Dryvit Borocal-5Rh fungicidal wash to the entire substrate surface and allow to fully dry.
- It is recommended that rough masonry surfaces are re-profiled with a levelling mortar such as Dryvit Stucco Build prior to board installation, for localised areas the cementitious adhesive may be applied more generously to correct front face alignment.
- To begin, secure the Dryvit Starter Track or back wrap the insulation at the base of the wall.
- Apply the mixed adhesive on the reverse of the insulation board using the ribbon and dab application method and position the board horizontally on the substrate. Press the board gently to the substrate and into position. Apply firm pressure over the entire surface of the insulation board to ensure uniform contact and high initial grab.
- A mechanical fixing may be installed to provide additional stability until the adhesive cures or the fixings through the mesh are in place.
- Ensure that the insulation board joints are butted tightly and are level and flush.
- Do not allow adhesive to remain in board joints since material in board joints can result in cracking.
- Install subsequent rows of insulation board in a running bond pattern (vertical joints staggered a minimum of 200 mm).
- With factory edges exposed, stagger vertical joints at inside and outside corners, making sure the corners are straight and plumb.
- At penetrations, align the insulation boards so that the edges (vertical and horizontal joints) do not coincide with the corners of the opening, this will reduce stresses on the base coat.
- Installation in this manner will reduce the potential for cracks to develop.
- To ensure an overall flat surface, tamp the surface of the entire wall with a suitably sized board.
- If for any reason the insulation board joints are not butted tightly, the gaps must be filled.
- All gaps greater than 1.5 mm up to 7 mm are filled with Dryvit FF197 expanding polyurethane foam. The foam is injected into the gap and should penetrate as far back to the substrate as possible. After it cures, the excess is sliced off using a knife or trowel edge flush with the face of the board.
- Gaps greater than 7 mm are filled with a cut sliver of insulation. To create a tight-fitting sliver, it is recommended that a wider joint be cut before the insulation sliver is fitted. Do not install adhesive on sliver edges.
- Allowing this method of filling gaps between the insulation boards is not intended to take the place of good workmanship and care must be taken to ensure that all insulation boards are abutted as tightly as possible during installation.
- Ensure with a 2.4 m long straight edge that the surface of the insulation boards is level and flat before the application of the base coat, mesh and fixings.
- Once the insulation boards are in place, apply base coat to the face of the boards to achieve a nominal thickness of 3 mm.

A tight skim coat of base coat applied to the surface of all the insulation boards

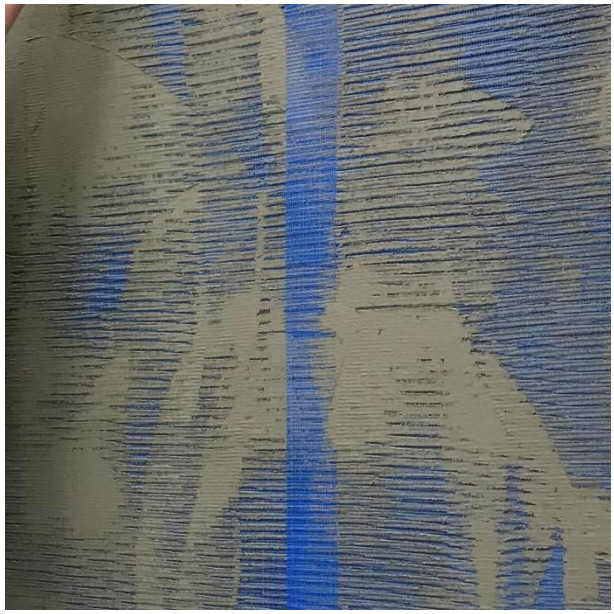
Skim coat applied ready to receive first pass

First pass of base coat applied with an 8 mm notched trowel to achieve a nominal 3 mm first coat

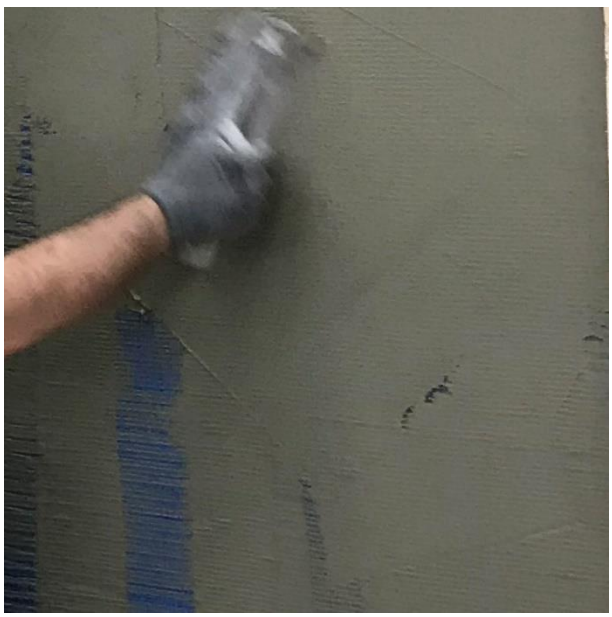
- Place the reinforcing mesh over the base coat and embed it in to the render surface using a trowel, the mesh is overlapped 100 mm at each mesh joint.



Reinforcing mesh laid in to the notched coat



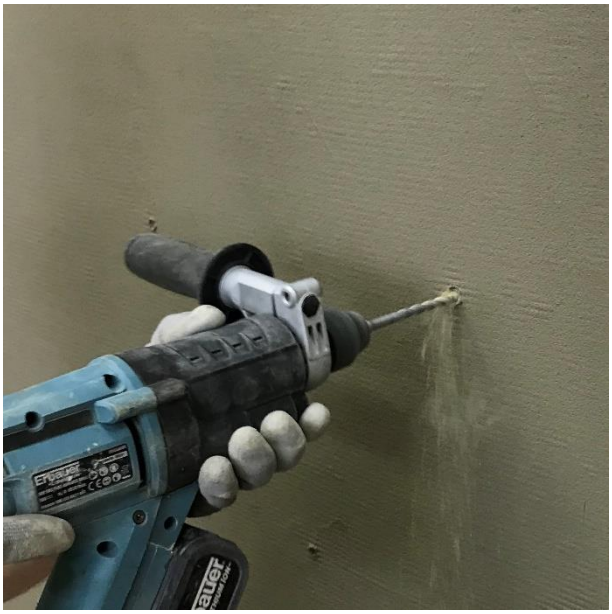
Reinforcing mesh overlapped a minimum of 100 mm at all mesh joints



Reinforcing mesh embedded into the surface of the first layer of base coat

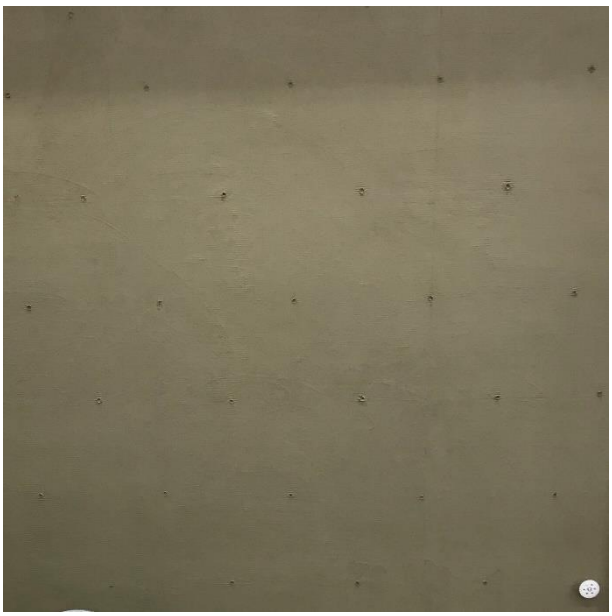
- Based on the substrate type and thickness of the insulation, Dryvit UK Ltd will advise on the type and length of fixing to be used.
- Fixings are installed through the wet base coat and mesh at 400 mm horizontally and 300 mm vertically in an off-set pattern.
- Use the correct diameter masonry bit and drill a hole through the wet base coat, mesh and insulation board into the substrate to the correct fastener embedment depth. The fixing is tapped into place using a hammer and the fixing screwed in to place so the fixing head indents in to the wet base coat and sits flush with the base coat surface. A plug is inserted into the recessed head of each fastener in accordance with the fixing supplier's installation instructions.

- If a fixing is overdriven and the local integrity of the insulating board lost, or the board is damaged or torn, a new fixing should be installed in the same proximity. The hole formed by the overdriven fixing should be filled with Dryvit FF197 expanding foam and the integrity and thickness of the base coat and mesh layer re-established.



Hole drilled through the wet base coat in to the substrate with a masonry drill of the correct size and embedment depth

Drill hole



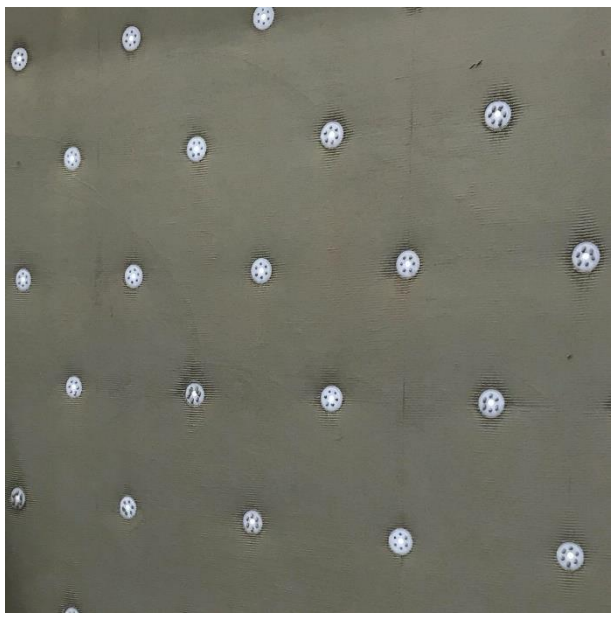
Holes drilled at 400 mm horizontal and 300 mm vertical centres in an off-set pattern

Fastener lightly tapped into the render surface

Fastener screw tightened and washer head sitting flush with the base coat surface

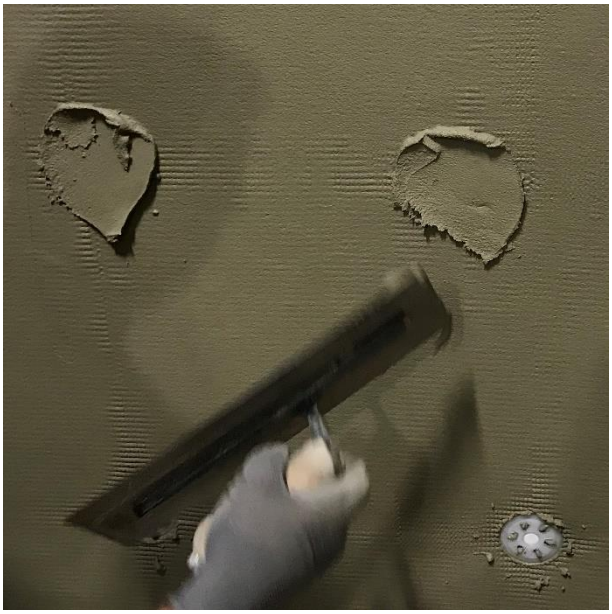
All fastener installed and tightened

Plug used to fill the recess in the head of each fixing

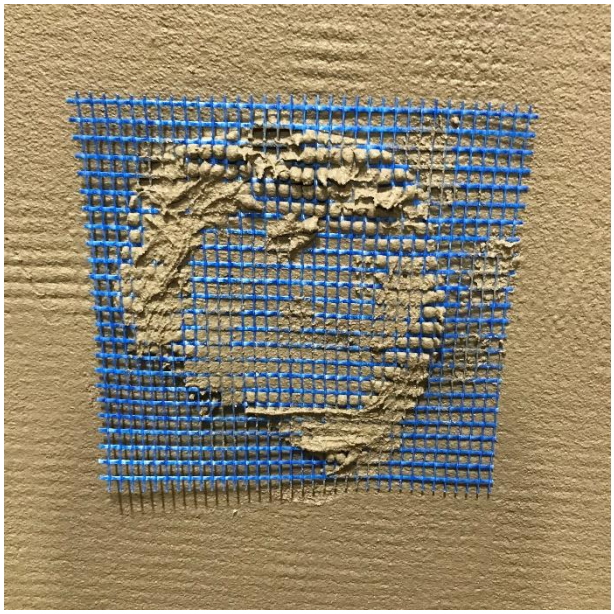


Installation of the fastener complete

- The head of each fastener is coated with additional base coat, a minimum 140 mm x 140 mm patch of reinforcing mesh is installed over the head of the fastener and embedded in to the additional base coat layer.
- Instead of using mesh patches, a second full layer of mesh can be installed and embedded in the second pass of base coat when it is applied. All full layers of mesh must be fully embedded and overlapped a minimum of 100 mm at all mesh joints.



Fastener heads fully coated with base coat



Mesh patches applied over each fastener head. Alternatively, a second full layer of mesh can be installed

Mesh patches fully embedded in base coat over the fastener heads

All mesh patches fully embedded in base coat

- Once the base coat has stiffened a second pass of base coat is applied to the entire surface and smoothed to provide a total base coat thickness of 5 to 6 mm ensuring a minimum 3 mm coverage over each fixing head.

Second pass of base coat applied over fasteners and mesh patches

Second coat applied with a notched trowel at a nominal 3 mm to achieve a total overall 5 to 6 mm base coat thickness

Second pass of base coat levelled to provide a flat uniform surface

- Leave the base coat to cure for minimum of 24 hours before working on the surface of the base coat to prevent any movement which may weaken the bond of the adhesive mixture to the substrate.

6 Installation of reinforcing mesh and base coat

6.1 Reinforcing mesh

- Dryvit Reinforcing mesh is available in the following widths and lengths:

Mesh type	Available sizes
Standard	1.2 m x 45.7 m
Standard Plus 150	1.0 m x 50.0 m
Standard Plus 160	1.0 m x 50.0 m
Standard Plus 200	1.2 m x 45.7 m
Intermediate 370	1.2 m x 45.7 m
Panzer 260	1.0 m x 50.0 m
Panzer 500	1.2 m x 22.9 m
Panzer 700	1.2 m x 22.9 m
Detail - Standard	240 mm x 45.7 m
Detail - Standard Plus	330 mm x 50.0 m
Corner	235 mm x 45.7 m
Profile beads with mesh	Supplied in 2.5m lengths (quantity per pack may vary).

- Prior to installing the reinforcing mesh, it should be inspected to ensure that it is supplied by Dryvit UK Ltd (ie blue mesh with Dryvit logo) and meet with the description given in project specification.

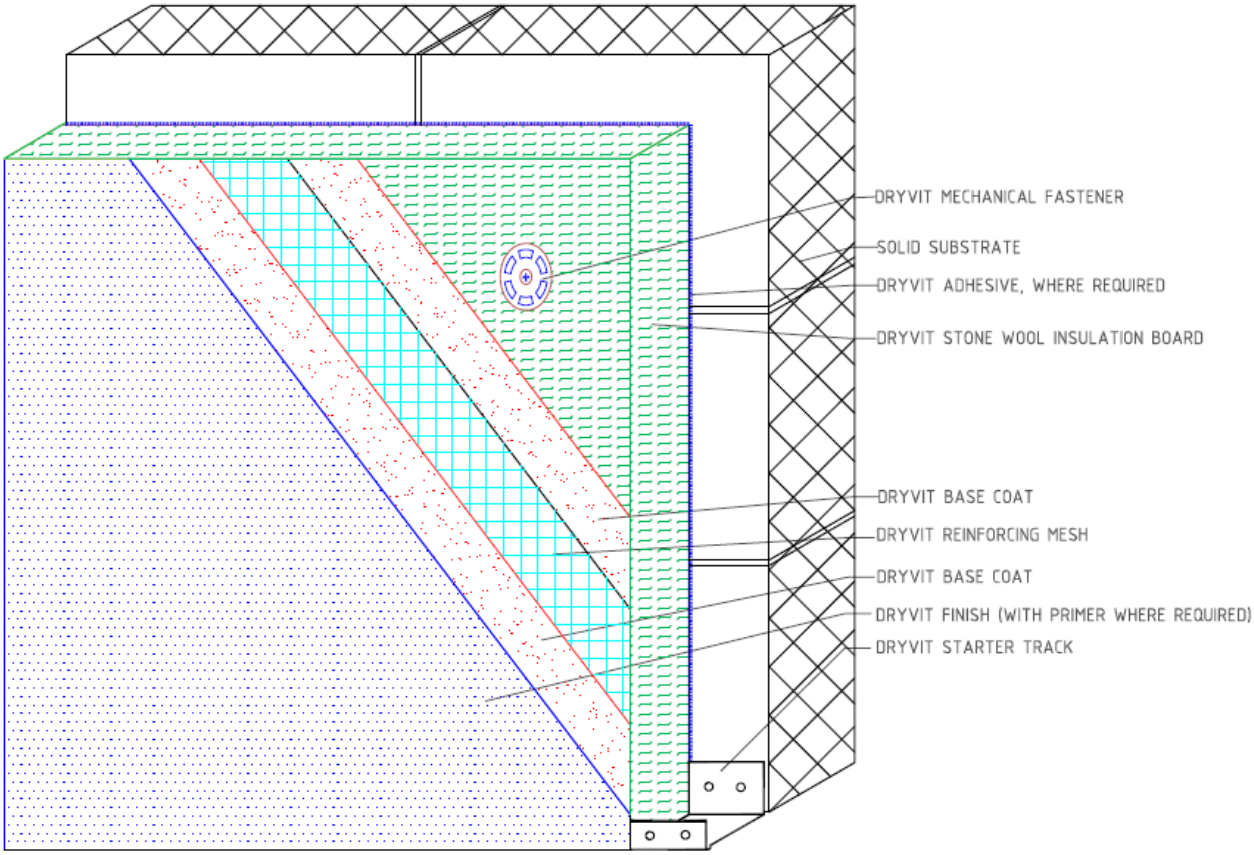
6.2 Insulation board inspection

- Prior to installing the reinforced base coat, inspect the surface of the insulation board for:
- Flatness, using a minimum 2.4 m straight edge.
- Damage and foreign materials; correct deficiencies as necessary.
- Surface degradation due to weathering or exposure to water must be reported. The Stone wool insulation must be dry prior to the installation of the base coat layer.
- Do not build up low areas with base coat mixture to form a flat surface.

6.3 Base coat and meshes

6.3.1 Single layer of mesh

- Relevant for Standard 150, Standard Plus 150, Standard Plus 160, Standard Plus 200 or Intermediate 370 reinforcing meshes. Panzer meshes are not suitable for use as a single layer application.
- Separate instructions are provided in the previous section of this document and should be followed when fixing through the mesh is specified.
- The insulation board surface must be dry prior to applying the base coat material. Do not apply the Dryvit materials in the rain.
- Mix the required base coat mixture in accordance with the relevant technical data sheet.

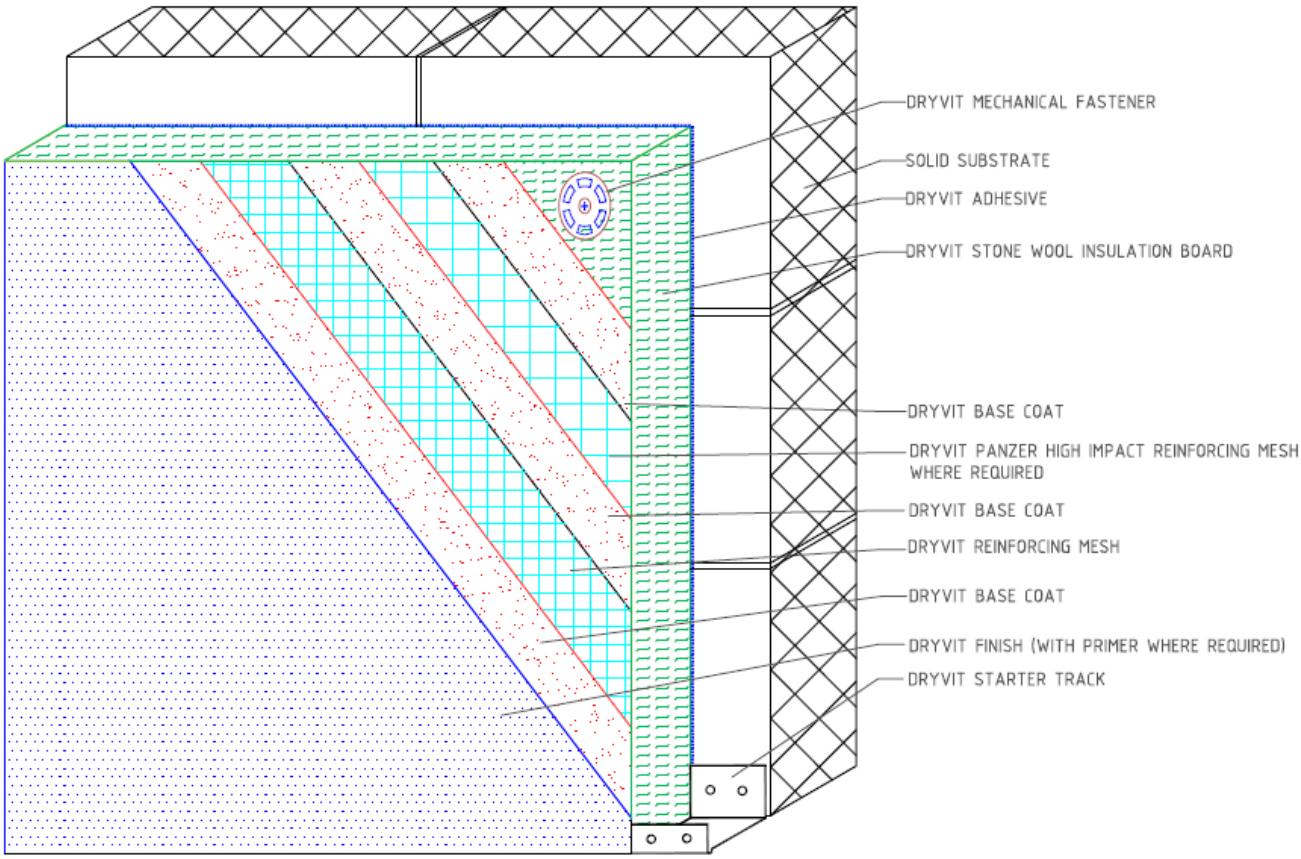


- The base coat is applied such that the resulting overall minimum base coat thickness is sufficient to fully embed the reinforcing mesh and provide a flat and level surface to receive the finish. The recommended method is to apply the base coat in two passes.
- Using a stainless-steel trowel, apply a tight skim coat of the base coat mixture on the entire surface of the insulation boards.
- Apply further base coat slightly larger than the width and length of a piece of reinforcing mesh, in a uniform thickness of 2 to 3 mm. This can be achieve using a slightly angled 8 mm notched trowel.
- The reinforcing mesh may be installed either vertically or horizontally.
- Immediately place the reinforcing mesh against the wet base coat mixture. With the curve of the mesh against the wall, trowel from the centre to the edges avoiding wrinkles, until the mesh is fully embedded and no longer visible.
- The reinforcing mesh shall be continuous at corners and the mesh edges lapped not less than 100 mm. Do not lap the reinforcing mesh within 200 mm of a corner. Corners and edges normally require light strokes with a small damp brush to smooth out any irregularities.
- Allow the base coat mixture to take up, typically one to four hours dependent on ambient conditions. Do not allow the first pass to completely dry prior to the application of the second pass otherwise an excessive amount of base coat mixture will be necessary to fully coat the surface.
- Apply a further layer of base coat over the first coat to fully cover the reinforcing mesh and achieve a flat and level surface with an overall thickness between 3 to 6 mm. The result should be such that the reinforcing mesh is approximately centred within the base coat thickness.
- Protect the completed work from rain, water penetration and run-off.

- Allow the base coat to cure a minimum of 24 hours before proceeding with the application of primer or finish coat. Cold or damp conditions may require extended drying times.
- Do not apply primer or finish to a wet or damp base coat.

6.3.2 Dual layer of mesh for high impact areas

- Panzer 260, Panzer 500 or Panzer 700 are used in combination with Standard 150, Standard Plus 150, Standard Plus 160 or Standard Plus 200 reinforcing mesh.
- Panzer high impact meshes are generally only installed to a two-metre height at the base of the system, or in certain localised areas where high impact conditions are expected.
- Mix the required base coat as described above.



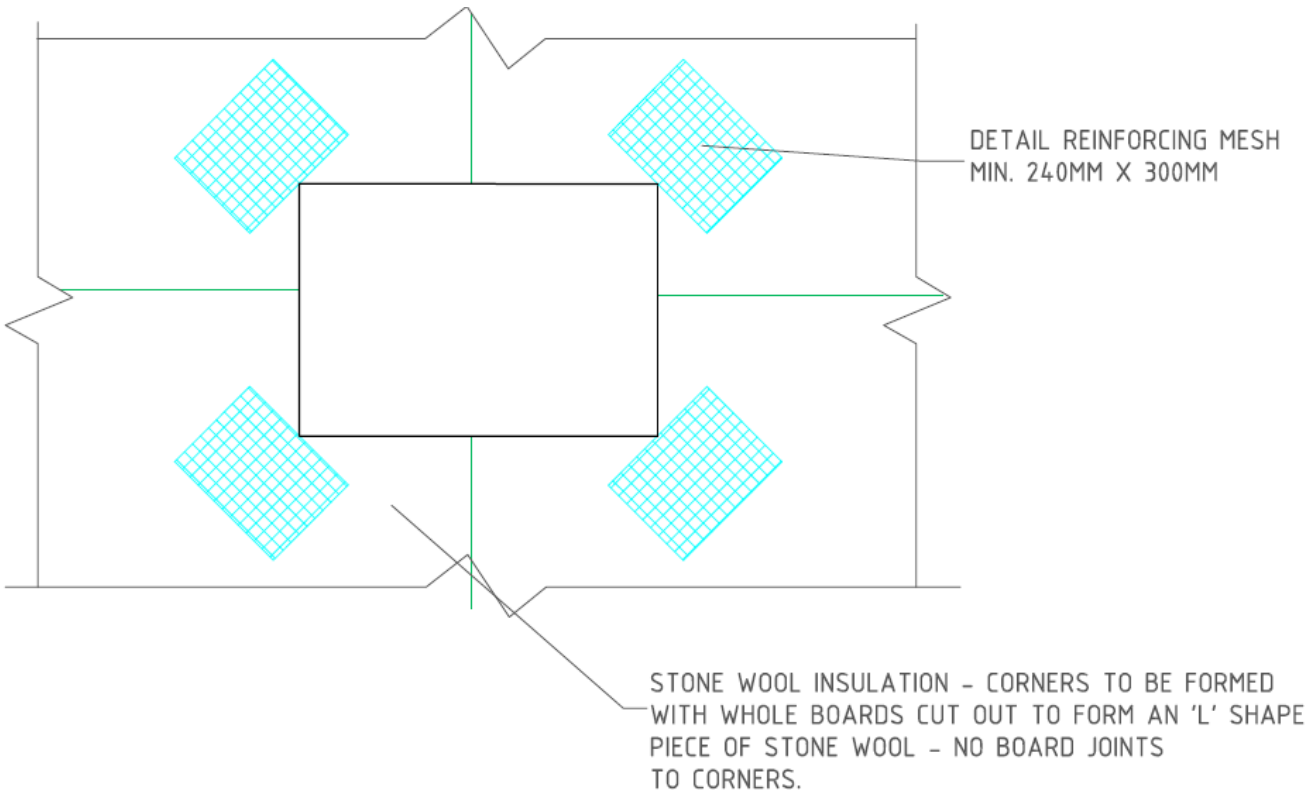
- The base coat is applied such that the resulting overall minimum base coat thickness is sufficient to fully embed the reinforcing mesh and provide a flat and level surface to receive the finish. The recommended method is to apply the base coat in two passes.
- Using a stainless-steel trowel, apply a tight skim coat of the base coat mixture on the entire surface of the insulation boards.
- Apply further base coat slightly larger than the width and length of a piece of reinforcing mesh, in a uniform thickness of 2 to 3 mm. This can be achieve using a slightly angled 8 mm notched trowel.
- Immediately place the Panzer mesh against the wet base coat mixture. with the curve of the mesh against the wall, trowel from the centre to the edges avoiding wrinkles until the mesh is fully covered and not visible.
- Continue in the same manner until the entire area requiring the Panzer mesh is covered.

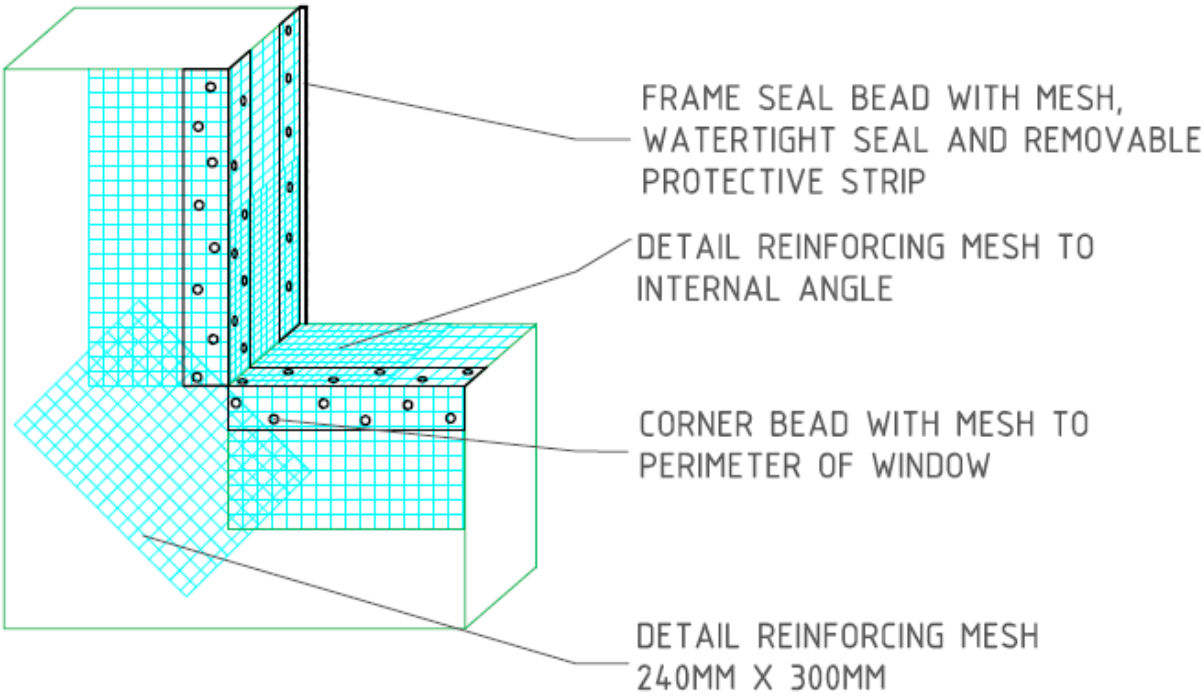
- Offset the edges of the Standard Plus reinforcing mesh from the edges of the Panzer mesh a minimum of 200 mm.
- If Panzer Mesh is installed horizontally, it is recommended the Standard Plus mesh be installed vertically and vice versa.
- Adjacent pieces must be tightly butted, do not overlap the Panzer mesh.
- Protect completed work from rain, water penetration and run-off.
- Allow the base coat to cure a minimum of 24 hours prior to applying the relevant Dryvit Standard reinforcing mesh.
- Apply the Standard mesh over the cured base coat as described in the previous section.

7 Penetrations and expansion joints

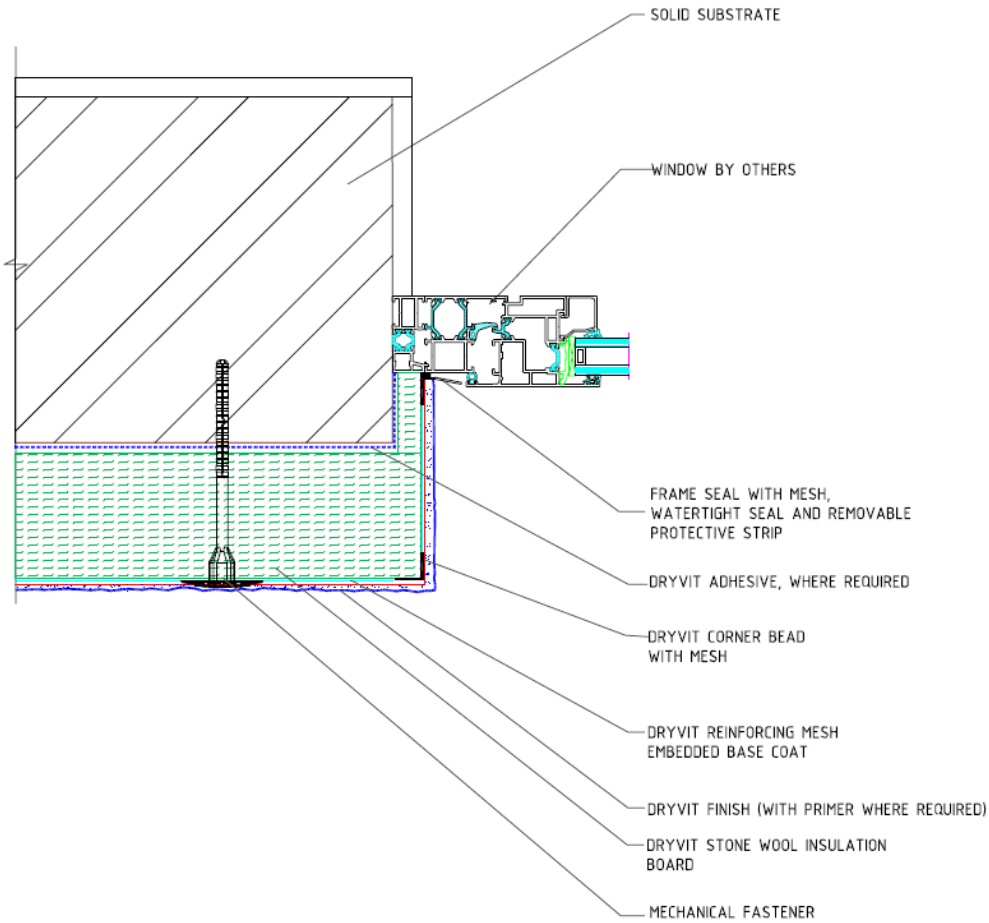
7.1 Windows, doors, mechanical equipment and all wall penetrations

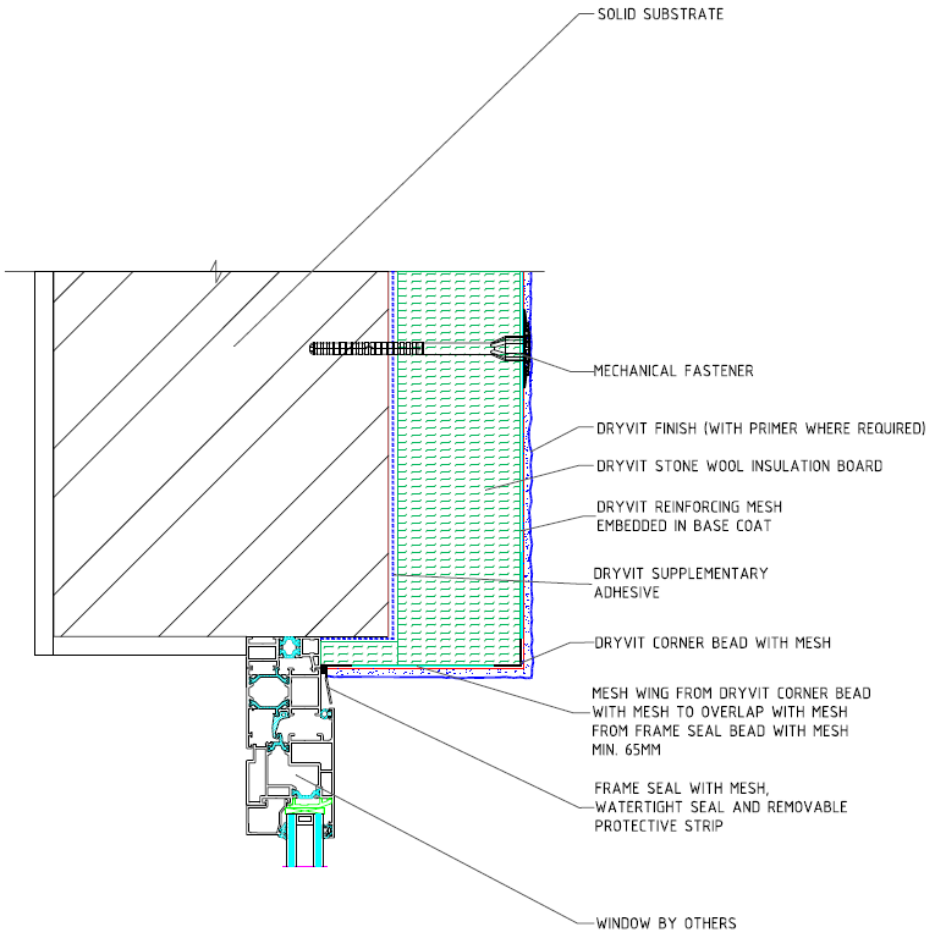
- At penetrations, align the insulation boards so that the edges (vertical and horizontal joints) do not coincide with the corners of the opening. This will reduce stresses on the base coat and minimise the potential for cracking, refer to Dryvit Roxsulation® Pro System Installation Details.
- Corners of all openings and penetrations shall be reinforced with a minimum 240 mm x 300 mm section of Detail mesh placed diagonally to the opening as illustrated above. This will reduce the potential for cracking at these high stress areas.

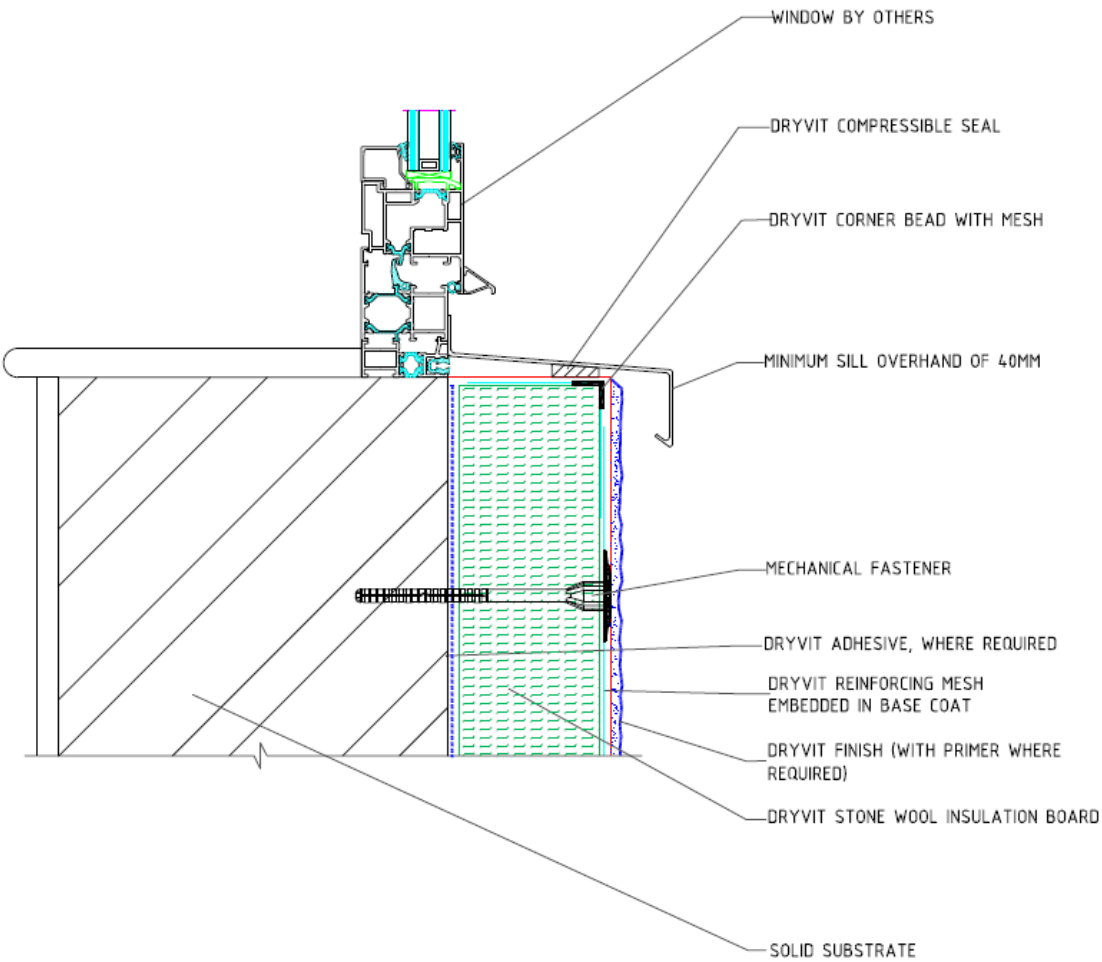




- Detail mesh or a corner bead with mesh shall attached and the mesh incorporated in the base coat layer around the perimeter of the opening as illustrated below.
- Window reveals and window heads should be terminated using a frame seal bead with mesh to provide watertight seal.
- Sills and other flashings should over hang the system by a minimum of 40 mm and a compressible seal used to provide a watertight seal between the top of the system and underneath of the sill.







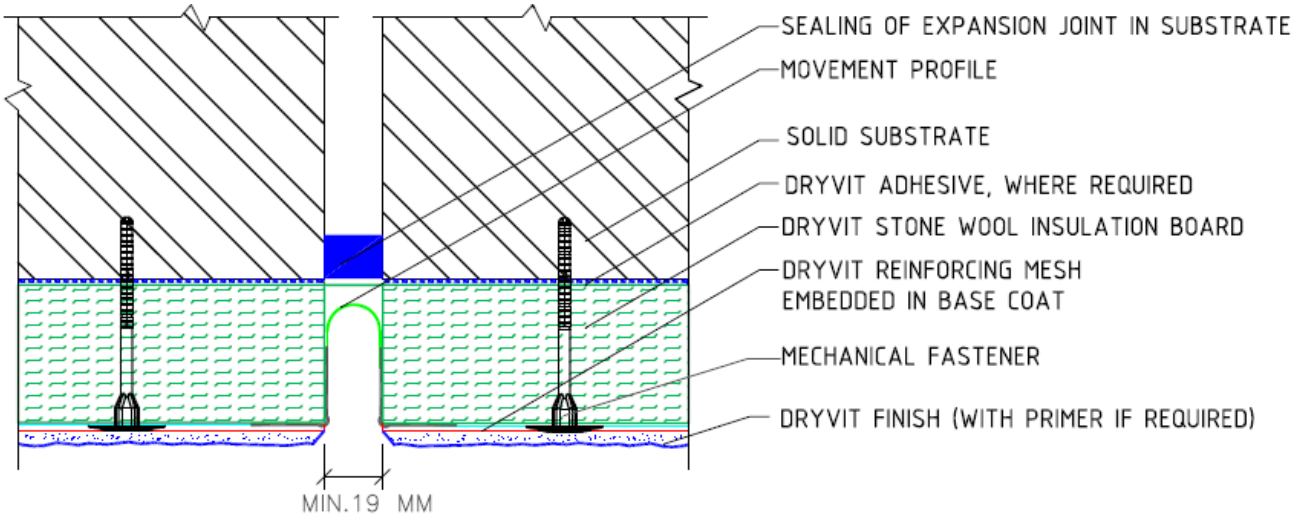
7.3 Expansion and movement joints

- All vertical and horizontal movement joints in the building structure should be extended through the system.
- A vertical and horizontal movement joint shall be incorporated:
  - a minimum of every 23 m or in accordance with project specific guidance.
  - when abutting dissimilar materials
  - at a substrate transition
- Expansion joints are required around penetrations in the system.
- Expansion and movement joints shall be 19 mm wide.

7.4 Horizontal and vertical Expansion joints

- These can be achieved by installing a movement profile, using a low modulus sealant with a closed cell backer rod or a Dryvit compressible weather seal with or without sealant.

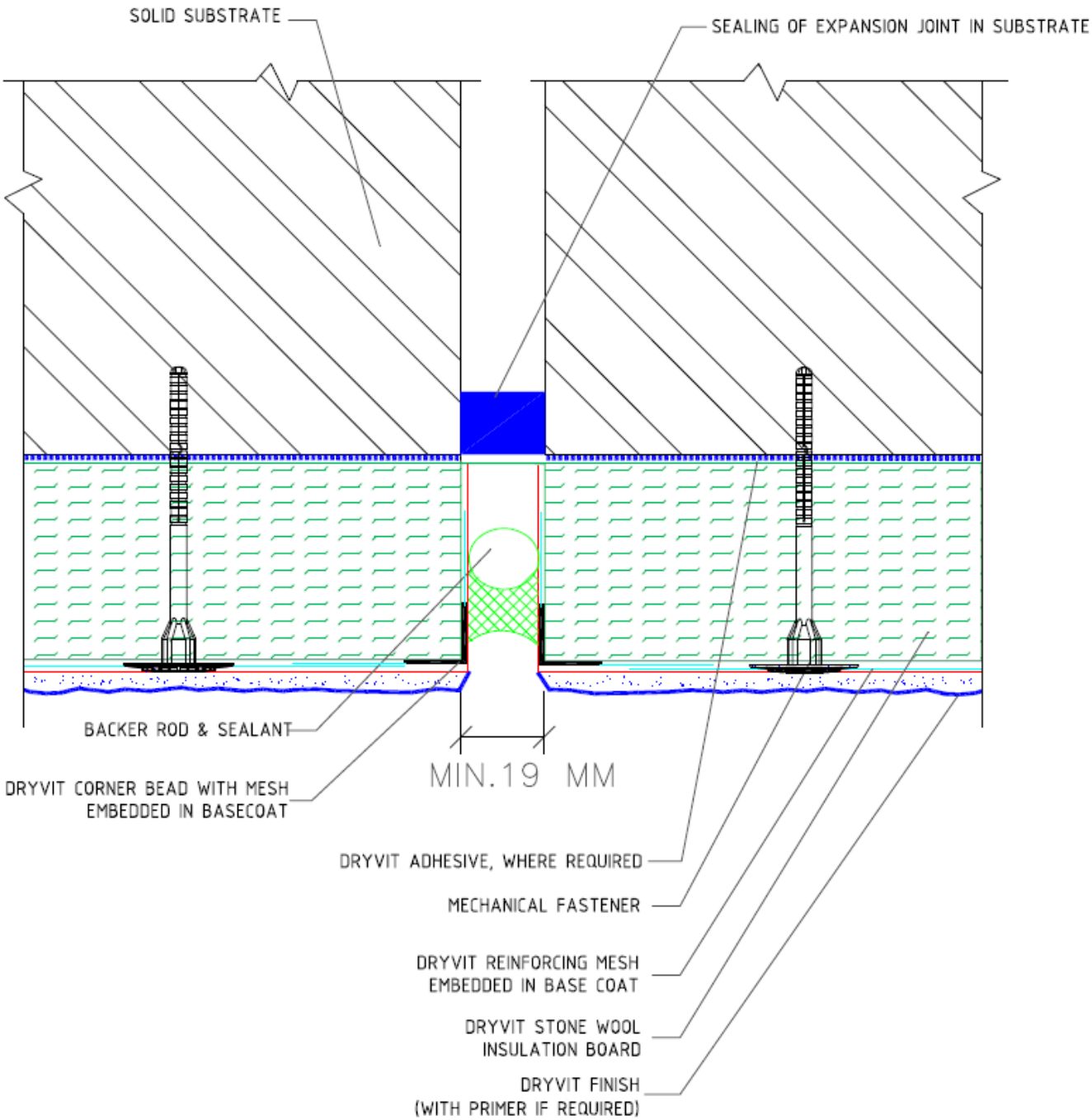
7.4.1 Movement profile



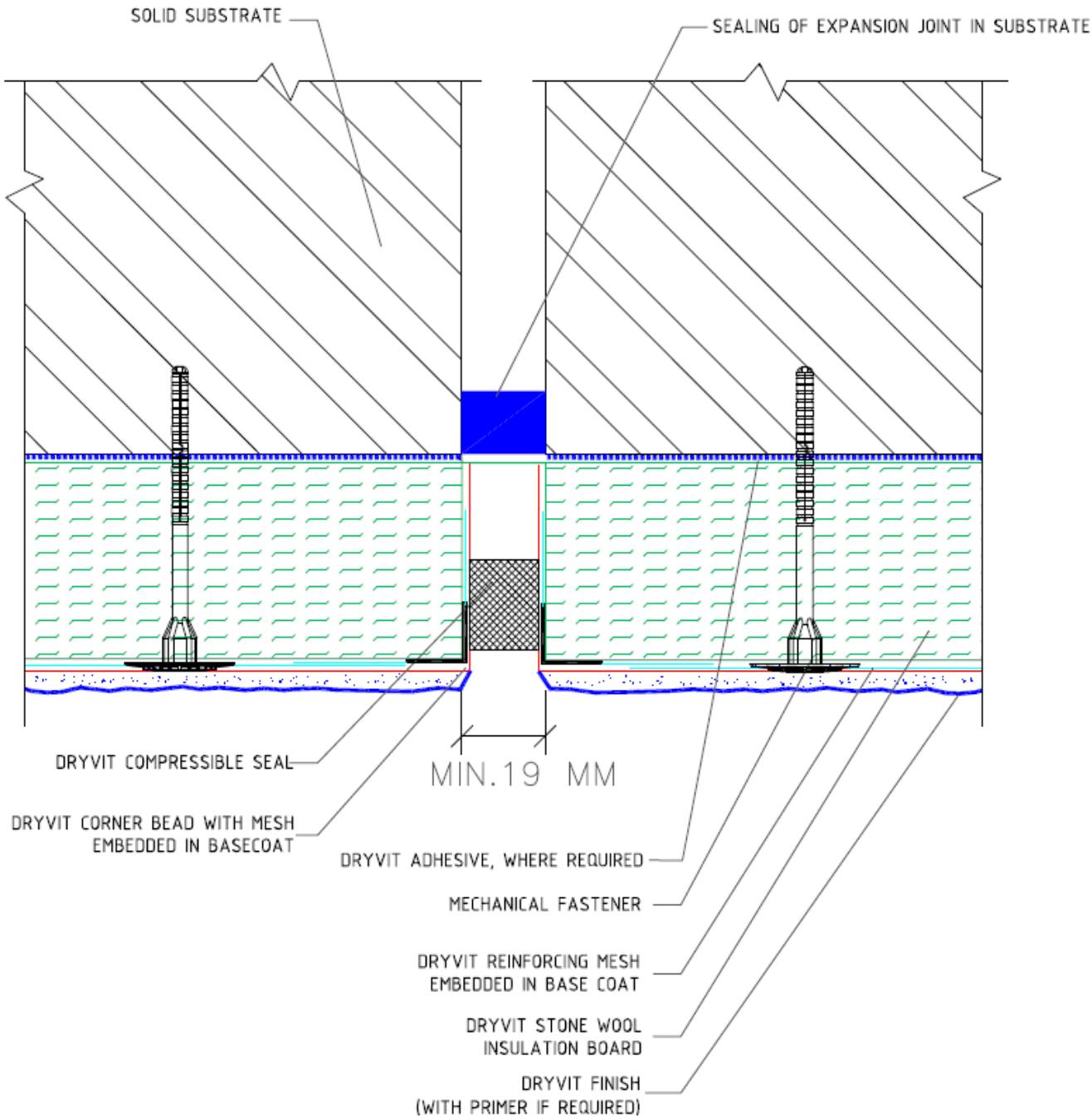
- At the desired location leave a 19 mm slot between the insulation boards.
- Apply a smooth application of the base coat either side of the joint and onto the joint faces sufficient to fully embed the expansion profile and wings.
- Install the profile in the joint and trowel the base coat smooth to embed the wings.
- The main reinforcing mesh is applied to the insulation boards either side of the joint ensuring a minimum mesh overlap of 65 mm or fully overlapping the mesh wing.
- Remove any protective tape over the flexible membrane after the finish is applied, but before it dries.
- Ensure all lengths of joints are weather lapped so water cannot run behind the profile.

7.4.2 Closed cell backer rod and sealant

- At the desired location leave a minimum 19 mm separation between the insulation boards.
- Apply a smooth application of base coat either side of the joint onto the insulation and onto the joint faces.
- Embed Corner Beads with mesh on both sides of the joint taking the mesh a minimum 40 mm into the joint and allowing a minimum 65 mm mesh overlap on the front face.
- Allow the base coat to dry and apply primer to the base coat areas in the joint to be sealed.
- Leave the primer to dry before inserting a tight-fitting polyethylene backer rod greater than the width of the joint at a depth half the joint width.
- Install the sealant in accordance with Section 9 and the manufacturer's instructions.



7.4.3 Compressible Seal with or without sealant



- At the desired location leave a minimum 19 mm separation between the insulation boards.
- Apply a smooth application of base coat either side of the joint onto the insulation and onto the joint faces.
- Embed Corner Beads with mesh on both sides of the joint taking the mesh a minimum 40 mm into the joint and allowing a minimum 65 mm mesh overlap on the front face.
- Allow the base coat to dry and apply primer to the base coat areas in the joint to be sealed.
- Leave the primer to dry before inserting the a Dryvit compressible seal compatible with the width of the joint and installed in accordance with the manufacturer's instructions.
- Sealant may be installed over the compressible seal where a double seal is required or to colour match or compliment the selected finish.

7.4.4 Using Dryvit back wrap (where specified)

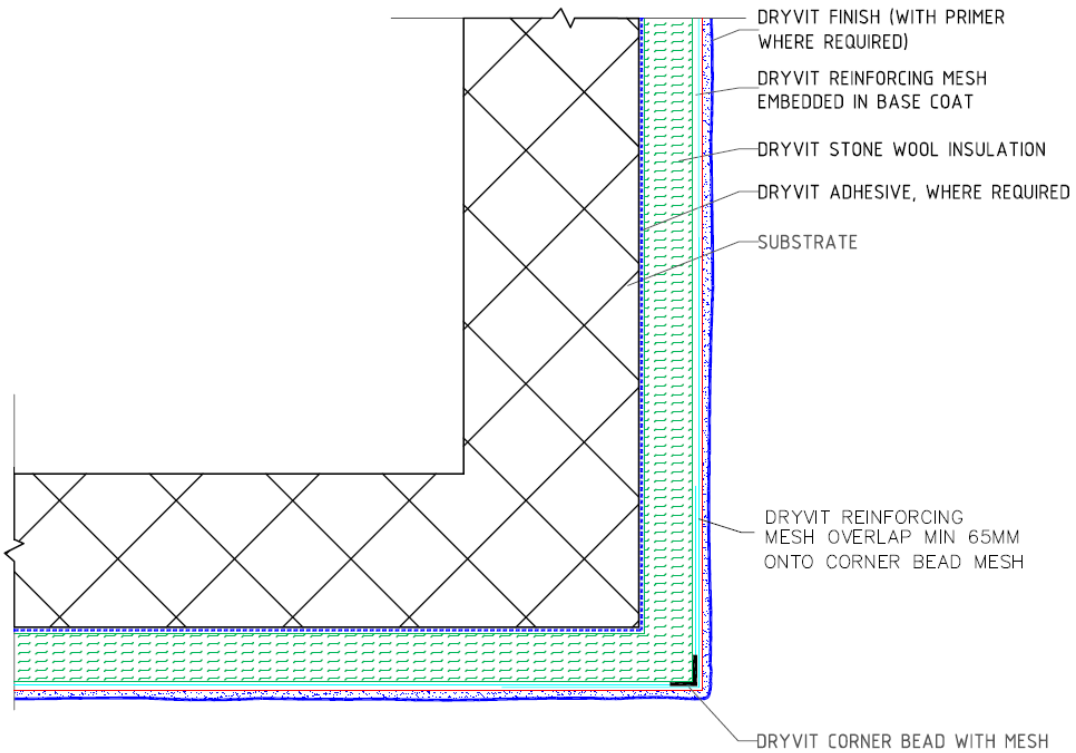
- The Detail mesh is used to form the joint and is attached to the substrate as described in Section 5.
- The insulation boards are installed to leaving a minimum 19 mm separation to allow for the backer rod and sealant to be installed.
- With a stainless-steel trowel, the base coat is applied to the edge and face of the insulation boards.
- The Detail mesh used to form the back wrap is embedded in the wet base coat mix mixture and returned on to the surface of the insulation boards either side of the joint. Sufficient mesh is required to overlap with the main mesh on the face of the boards a minimum 65 mm.
- Run a corner trowel along the joint arises to ensure they are crisp and straight and allow to dry.
- Allow the base coat to dry and apply primer to the base coat areas in the joint to be sealed.
- Leave the primer to dry before inserting a tight-fitting polyethylene backer rod greater than the width of the joint at a depth half the joint width.
- Install the sealant in accordance with Section 9 and the manufacturer's instructions.

7.4.5 Full system beads

- These are installed prior to the installation of insulation and consist of a starter track profile fastened back to the substrate with a clip section over the front upstand of the track with an angle section beneath. Contact Dryvit UK Ltd for full details.

7.4.6 Outside corners (beads)

- Ensure the insulation boards at the corner form a straight edge so the angle of the bead sits snuggly onto the insulation. Apply base coat to the corner sufficient to fully embed the mesh wings. The Dryvit Corner Bead with Mesh is pushed tight onto the corner and the mesh fully embedded by trowelling base coat smoothly over the surface. The main reinforcing mesh is applied over the bead mesh a minimum of 65 mm. The mesh should not overlap onto the PVC angle.



8 Fixtures and fittings

- Where there is a requirement to attach fixtures and fittings through the thermal insulation system, unlike conventional building substrates, External Wall Insulation systems do not offer the same strong anchorage by conventional installation methods.
- Lightweight fixtures and heavier items that cantilever from the wall, can be fixed using a range of purpose designed specialist fixing solutions. Contact Dryvit UK Ltd for further information.

9 Sealant joint preparation

- All sealant joints shall be prepared with Colour Prime Plus or Demandit Smooth.
- Stir the primer to a smooth and homogeneous consistency.
- Apply the primer with a brush on each side of the joint.
- Allow the primer to dry prior to sealing with an appropriate sealant. Contact Dryvit UK Ltd for advice on sealant selection.

10 Dryvit primers

- Prior to applying the Dryvit primers, the base coat shall have cured for a minimum of 24 hours and shall be dry and hard. Cure time may be longer depending on environmental conditions.
- Inspect the base coat for any irregularities such as trowel marks, board lines, rough corners and edges, improper reinforcing mesh embedment as well as efflorescence.
- Correct all irregularities and remove all efflorescence prior to applying the Dryvit primer.
- The primer shall be applied in accordance with the relevant product technical data sheet.

11 Dryvit finishes

- The selected finish shall be applied in accordance with the relevant product technical data sheet.
- Prior to applying the Dryvit finish, the base coat shall have cured for a minimum of 24 hours and shall be dry and hard.
- Inspect the base coat for any irregularities such as trowel marks, board lines, rough corners and edges, proper reinforcing mesh embedment as well as efflorescence.
- Correct all irregularities and remove any efflorescence prior to applying the selected Dryvit Finish.
- When Dryvit primers are used they should be dry before the application of the finish.
- Drying time of the base coat and primer will depend on both environmental conditions and permeability of the substrate.
- All Dryvit finishes must be installed by applicators trained by Dryvit UK Ltd.
- Apply continuously to a natural break such as corners, expansion joints or tape line maintaining a wet edge at all times.
- Whenever possible, order enough material in a single batch to complete the project to avoid potential colour variations from batch to batch.
- Sufficient personnel and scaffolding must be provided to continuously finish a distinct wall area, otherwise cold joints will result.

- On hot windy days, the wall may be fogged with clean potable water to cool the wall and facilitate finish installation. As with other plaster materials, installation work should precede the sun. For example, work the shady or cool side of the building. If this is not possible, scaffold should be shaded with suitable tarpaulin, netting or cloth.
- Do not introduce water to the finish material once it is installed on the wall as this will cause colour variations.
- Each applicator must use the same tool and hand motion and match the texture of the applicators above, below and on each side.
- Do not apply Dryvit materials in the rain.
- Do not apply Dryvit finish material in sealant joints.

12 Maintenance and repair

Dryvit Information Sheets are available on request from Dryvit UK Ltd. These describe the inspection, maintenance and cleaning procedures for our system together with a range of remedial methods.

13 Applicator training

To attain a Trained Contractor Certificate of Competence(1), individual installers must demonstrate they are conversant in all the application techniques demonstrated to them and discussed within the Dryvit programme of training undertaken. They must understand the importance of attention to detail in all aspects of installing the Roxsulation® Pro System and finishes.

(1) The Trained Contractor Certificate indicates certain employees of the company have been instructed in the proper application of Dryvit products and have received copies of Dryvit's Application Instructions and Specifications. The Trained Contractor Program is not an apprenticeship or endorsement. Each trained contractor is an independent company experienced in the trade and bears responsibility for its own workmanship. Dryvit UK Ltd. assumes no liability for the workmanship of a trained contractor.

DISCLAIMER

Information contained in this document conforms to standard detail and product recommendations for the installation of the Dryvit Roxsulation® Pro System products as of the date of publication of this document and is presented in good faith. Dryvit UK Ltd. assumes no liability, expressed or implied, as to the architecture, engineering or workmanship of any project. To ensure that you are using the latest, most complete information, contact Dryvit UK.

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