

Caviteclad Thermashell Specification

1. Introduction

This specification is for the application of Specialized Construction Products Caviteclad Thermashell Exterior Insulation and Finishing System (EPS).

The Caviteclad Thermashell system is made up of 75mm Neopor® EPS sheets that are fixed to timber or steel framing over the surface of a 20mm cavity. The chosen backing substrate is then overcoated and reinforced with a range of specially blended proprietary cement or acrylic-based plasters before the walls are finished with a finishing plaster chosen from Specialized Texture range or Dulux Acratex Acrylic Texture range and painted with Dulux Acratex 955 Acrashield Advance acrylic paint system.

The Caviteclad Thermashell System can also be bonded or mechanically fixed to concrete or masonry walls (Note: This application is outside the scope of the BRANZ Appraisal).

All the PVC flashings, fibreglass mesh, resin, fixings, and plaster components used for the Caviteclad System must be supplied by Specialized Construction Products or one of its certified distributors.

2. Health & Safety

Avoid contact with eyes and prolonged contact with skin. Wash thoroughly after handling all wet or dry material. In case of eye contact, flush immediately with running water for at least 15 minutes. Consult a physician immediately. Do not take internally. The potential irritant nature of cement dust (in dry powder form or from subsequent cutting of the hardened product) is recognised. Paper dust masks or a respirator must be worn at all times when the product is being mixed. Be sure to provide adequate ventilation when working in enclosed areas. The wet compound is alkaline and prolonged skin contact should be avoided. People with sensitive skin must wear rubber gloves when handling the product. Materials Safety Data Sheets are available on request.

3. Framing Set Out (Timber or Steel)

Timber framing must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604.

Buildings or parts of buildings outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS1170.

In all cases, studs must be set out at 600mm maximum centres for buildings designed to NZS 3604 in Wind Zones up to and including Very High, and at 400mm maximum centres for buildings situated in NZS 3604 Wind Zone Extra High and specifically designed buildings situated in Wind Zones above NZS 3604 defined Extra High. Dwargs/nogs must be flush fitted at maximum 800mm centres. Edge fixing for the EPS sheets must be provided. All soffit junctions, openings, wall/ roof junctions and foundation details must have support for the sheet edges. Timber framing must have a maximum moisture content of 24% at the time cladding commences. For steel framing the minimum framing specification is 'C' section studs and nogs of overall section size 75mm web and 32mm flange. Steel thickness must be a minimum of 0.55mm.

As per the guidelines of NZS 4214:2006 the thermal calculation for the 75mm Caviteclad Thermashell System installed over a 20mm cavity which is attached to the surface of a wall incorporating an R=1.8 wall batt.

4. Building Wrap

All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including Very High. Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Flexible wall underlay shall be building paper complying with NZBC Acceptable Solution E2/AS1 Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlays. Rigid wall underlay shall be plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1 Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems. The selected building underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the Caviteclad Thermashell System. Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75mm minimum at horizontal joints and 150mm minimum over studs at vertical joints.

Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected. Where studs are at greater than 450mm centres and a flexible wall underlay is being used, a building underlay support must be installed over the underlay at maximum 300mm centres horizontally.

5. Head Flashings

Proprietary uPVC head flashings with minimum ventilation openings of 1000mm² per lineal metre must be installed over all window heads and door openings. If proprietary uPVC head flashings cannot be used, an acceptable alternative flashing must be provided. Please contact Specialized Construction Products for advice.

6. Flashing in General

Joists designed to carry decks need to have a continuous flashing fitted before the Caviteclad Thermashell is fixed. Check if there are any special back-flashings required where the Caviteclad EPS joins another substrate or curtain wall construction

7. Roofing & Window Setout

Where areas over roofs need to be plastered, the roof/wall flashing must be installed prior to the commencement of cladding. To ensure the proprietary flashings for this system can be installed correctly, please allow a gap of 24mm from the surface of the building paper to the backside of the aluminium joinery.

8. Pipes & Meter Boxes

It is critical that pipes are flashed appropriately in accordance with E2/AS1 fig 68. All pipes must have the building underlay turned to the outside of the building and have the building underlay taped to the outside of the pipe. All pipes must have a downward rake of a minimum of 5° and must be sealed in place using MS Sealant or another approved equivalent both before plastering and after the installation of the base coat. All meter boxes must be correctly flashed in accordance with the detailed drawings for the Caviteclad Thermashell System. Particular attention to detail and workmanship must be given to the weatherproofing details contained in the technical literature relating to flashing and sealing building penetrations or junctions with other building materials. All junctions between the Caviteclad Thermashell substrate and dissimilar materials must be correctly flashed and sealed with MS Sealant or another approved equivalent. The sealant must be installed in strict accordance with the manufacturer's requirements and must be left to properly cure prior to plastering.

9 Preparation of Masonry and Concrete Surfaces

Note: This application is outside the scope of the BRANZ Appraisal.

All surfaces to receive a direct bonded application of the Caviteclad Thermashell System must be clean and free of debris, dirt and dust, efflorescence, grease, oils, curing agents, cleaning solutions, mould and algae or any other contaminants that may affect adhesion. Painted or glossy surfaces must be specially treated prior to the application of any plaster material, please refer to Specialized Construction Products for specialist advice before you proceed. All cracks that may be the subject to ongoing movement must be correctly repaired and reinforced.

Some smooth, dense concrete surfaces must be slush coated before the application of the Caviteclad bonding plaster to ensure suitable adhesion is created, please refer to Specialized Construction Products for specialist advice before you proceed. Tilt slab and other precast concrete items should be cleaned with Dulux Acratex 400/4 Tilt-Wash to ensure any mould release agents are removed before the plaster is applied. All very porous surfaces should be sealed with Dulux Acratex 501/10 Green Render Sealer prior to the application of the bonding plaster. Failing to correctly prepare the masonry substrate, may affect the aesthetic appearance of the finished wall. Do not wet down masonry surfaces before plastering and do not apply base coat plaster to surfaces that are wet from rain or overnight dew.

10 Caviteclad Battens

Caviteclad battens are manufactured from high density (Class H) expanded polystyrene with an approximate density of 24kg/m³ and measure 21mm x 50mm. All battens must be stapled to the framing or alternatively glued to the chosen building underlay in accordance with the batten layout shown in the detail data sheets. Additional vertical battens are required at internal and external corners and openings.

At the soffit the airflow must be blocked off from the roof space. Horizontal battens must be a maximum length of 100mm long in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.2(f) and must be stapled into place on all noggins/dwangs where required for fixings with a minimum of a 5-degree angle on the top edge. The fewer horizontal battens that are used the better.

11 Sill and Jamb Flashings

The use of the Caviteclad uPVC sill and uPVC Jamb flashings is **MANDATORY**. It is also **MANDATORY** that the sill and jamb flashings are joined in the corner with a Specialized Construction Products Caviteclad corner socket.

12 Soffits, Gable Ends and Unlined Walls

Soffits shall be fixed into place before the cladding is installed and allowance made to close off the cavity with framing or battens to stop airflow into the roof space. After the mesh and plaster system has been completed a 5mm bead of MS Sealant or 'no more gaps' should be installed at the soffit Caviteclad Thermashell intersection. In the case of reverse raking soffits, a flashing or piece of Protecto EIFS tape shall be provided in accordance with the details shown in the technical literature.

To ensure the system is not affected by timber shrinkage in areas that are not traditionally lined (e.g., gable ends), it is highly recommended that the internal walls of these areas are adequately braced with a thin sheet of plywood or an alternative bracing material.

Alternatively, the timber in these areas must have a moisture content of no greater than 18% and must remain that way throughout the entire construction process.

13 Fixing 50mm Neopor Sheets

The sheets must be butt jointed except at corners where one sheet may overlap the other to form a straight finish. Horizontal sheet edges must be supported at fixing locations with cavity spacers a maximum of 100mm long in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.2(f). At the base of walls, the finished level of the substrate must be at least 50mm below the supporting framing. Additional framing will be required at soffits, internal and external corners and window and door openings for the support and fixing of sheet edges.

All sheet joints and edges must be supported. The only exception to this rule is at the base where the sheets can hang 50mm below the supporting frame.

Construction joints are needed in walls longer than 20 metres or higher than two stories. This doesn't apply to two storey houses with gable ends. Construction joint details are provided in the drawings provided with the system.

Inter-storey drained joints must be provided for walls over two storeys or 7m in height in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4.

Inter-storey junctions must be constructed in accordance with the technical literature.

All gaps between the EPS sheets must be flush filled with adhesive spray foam prior to the base coat plaster being applied. Any oxidization on the surface of the EPS must be removed with a stiff broom and water, and then the cleaned surface must be scratched to provide a key before plastering begins.

14 Timber Framing

There are five Wind Zone categories listed in NZS 3604: Low, Medium, High, Very High, and Extra High. The "Building Wind Zone" for the job to be completed must be clearly understood before the application of any plaster.

15 75mm EPS Fasteners

The EPS sheets are fixed through the cavity battens and spacers to the studs with 120 x 4mm hot-dipped galvanised nails topped with 42mm Specialized Construction Products “polyfasteners”. (Note: All nails must be fixed with an edge clearance of minimum 10 mm and the framing must be specifically designed with a minimum framing size of 90 x 45 mm Grade MSG8.) All openings should be either nailed or screwed off at 200mm maximum centres. This ensures any possible movement between the joinery frame and the finished Caviteclad system is greatly reduced.

Screw fixings should be 120mm x 10-gauge AS 3566 Corrosion Class 4, hot dipped galvanised, countersunk, square drive with 42mm diameter washed, or 120mm x 10-gauge Grade 304 Stainless, countersunk, square drive screws with 42mm washers.

16 Steel Framing

The same fixing centres apply as for timber framing. Use Specialized Construction Products 42mm “polyfasteners” and self-drilling AS 3566 Corrosion Class 4, 6-gauge screws in NZS 3604 defined Exposure Zones B, C and D. The screw length must allow a 10mm minimum penetration through the steel framing.

17 Concrete & Masonry

(**Note:** This application is outside the scope of the BRANZ Appraisal.)

To bond the EPS sheets to masonry surfaces, mix up Specialized Construction Products fine base coat plaster with the addition of 1 litre of Specialized Construction Products resin per bag. Cut the substrate to size and check the fit. Apply the fine base coat plaster to the back of the sheet with a grooved trowel around the perimeter and in vertical strips every 400mm. Masonry anchors must be used to hold the sheets in place while the plaster is drying and to provide a mechanical fix for the EPS.

18 PVC Beads

All exposed corners and bottom edges must be protected by gluing on the appropriate uPVC section. The beads are glued on with Maxilam Sabrefix PS Adhesive

19 Stopping Up Prior to Mesh Coating

Once the chosen substrate has been correctly fixed into place, a two-metre straight edge should be used to check the walls are flat.

Durarasps should be used to sand off any large irregularities. To avoid the potential of ‘post plastering’ shrinkage it is highly recommended that the sheet edges are stopped with fine mesh coat plaster and left to dry before plastering commences. Once the surface is flat and true, all nail holes and uPVC extrusions should be stopped with a layer of fine mesh coat plaster. This will help to ensure that any shrinkage in any subsequent coats is kept to a minimum. Only once the walls are flat and true and have been well stopped should mesh coating commence.

20 Mesh Coating

The areas around all penetrations should be completed first using a soft flexible 160g/m² alkali resistant mesh followed by all the flat areas of wall using a 160g/m² alkali resistant hard mesh. All mesh must overlap any adjacent drop by a minimum of 30mm. At the corners of all openings, a second layer of mesh 100 x 200mm (butterfly) must be applied and embedded in the mesh coat plaster on the diagonal to reduce the chance of any subsequent cracking at these high stress points.

21 Cement Based Finishing Options

There are ten finishing texture options once the first mesh and plaster coat have been applied:

Option 1: Stucco Texture

Fine base coat plaster can be sprayed through a hopper gun or a Sagola gun to achieve a heavy stucco plaster finish.

Option 2: Float Finish

Float Finish is a polymer modified cement-based plaster which is polished flat to achieve a fine granular finish. The smooth plaster will not cover up background imperfections, particularly when walls are subject to side lighting at certain times of the day.

Option 3: Spanish Finish

Spanish Finish is a polymer-modified, cement-based plaster used to achieve an undulating adobe style finish. This product can be applied in various thicknesses and using a number of different techniques.

Before finish coating begins ensure the style of finish that is desired has been correctly communicated and understood by the plasterer. A trial sample is highly recommended.

Option 4: Fine Spray Texture

Spray texture is a granular plaster designed to give a fine stippled appearance. Spray texture is best applied using a Sagola gun with a 6mm tip and with the compressor set at approximately 60psi.

22 Powaflex Acrylic System

The areas around all penetrations should be completed first using Powaflex imbedded in soft flexible 160g/m² alkali resistant mesh to all reveals. A piece of soft mesh must be used to reinforce the head flashings, jambs, and sills onto the surface of the panels and in the corner of any penetration where the sills and jambs meet. Once all penetrations and awkward areas have been completed all the flat areas of wall should be done using a 160g/m² alkali resistant hard mesh.

Drops of hard mesh do not have to overlap but should be tightly butt joined. If the mesh isn't going to be overlapped any butt joint that is created must offset any vertical join in the panels by a minimum of 150mm.

23 Acrylic Finishing Texture Options

Below are the options once the Powaflex Base Coat has been applied:

Option 5: Acratex 951 Coventry Coarse Acrylic Texture - 15L

Option 6: Acratex 951 1mm Super Trowel Acrylic Texture - 15L

Option 7: Acratex 951 Sienna Coarse Sand Finish Acrylic Texture - 15L

Option 8: Acratex 951 Sienna Natural Acrylic Texture - 15L

Option 9: Specialized FlexiFloat - 20kg (This product is a bagged texture and not tintable)

Option 10: Specialized FlexiFlat - 20kg (This product is a bagged texture and not tintable)

The ready to use, acrylic textures which when polished flat achieve a granular finish. Smooth plasters will not cover up the background imperfections, particularly when walls are subject to side lighting at certain times of the day.

Note:

When using acrylic textures over a modified cement base, seal the cement base with one coat of Acratex 501/10 Green Render Sealer prior to applying the acrylic texture.

24 Curing

The curing time of finishing plaster will vary due to ambient temperature, relative humidity, surface temperature, surface porosity, application methods, and/or the thickness of the material. All freshly applied material must be protected from inclement weather for a minimum of 24 hours after application. It is the responsibility of the plaster applicator to determine if the product is cured and/or dry prior to applying any additional coats that may be required or exposing the applied product to rain, snow, dew, and/or any other inclement weather condition that may have a detrimental effect. Cement-based plasters will not fully cure for 28 days. However, plasters can be coated with Dulux Acratex 510/10 Green Render Sealer prior to applying paint coatings, they can be painted after the finish coats have cured for a minimum of 3-4 days.

25 Painting

Specialized Construction Products highly recommends that the paint system is applied in three coats. One coat of a Dulux Acratex 501/10 Green Render Sealer followed by two topcoats of Dulux Acratex 955 Acrashield Advance in the chosen colour.

The specified paint system must be used over the Caviteclad finishing plasters to make the system weathertight and give the desired finish colour to exterior walls. Dulux Acratex 955 Acrashield Advance is a 100% acrylic-based paint that has been specially formulated for use over cement-based plasters it can be tinted to a selected colour and should be applied by brush and roller at a spread rate of approximately 6m²/litre. All cement based plastered surfaces must be coated with Dulux Acratex 501/10 Green Render Sealer followed by 2 coats of Dulux Acratex 955 Acrashield Advance.

Dulux Acratex 955 Acrashield Advance is an exterior paint system complying with all of Parts 7, 8, 9 or 10 of AS 3730 may be used. The paint system must be applied in accordance with the paint manufacturer's instructions.

Other paint systems are not covered by this specification sheet and Specialized Construction Products will not warrant the use or suitability of alternative paint systems over the surface of its plaster finishes.

The chosen paint system must have a Light Reflective Value (LRV) of no less than 25%. If a dark colour has been specified below the 25% LRV then a full acrylic texture system should be used.

26 Plaster Site Storage

Products in dry form must be stored in a dry area, off the floor on a timber pallet or timber dunnage and must be protected from the weather and from mechanical damage. Stock must be rotated to ensure that the oldest material is used first. Plaster stock that is older than six months must be discarded. EPS battens, uPVC flashings and profiles must be protected from

direct sunlight and physical damage. They should be stored flat and under cover. Liquid components must be stored in a frost-free area.

27 Limitations

DO NOT apply plaster when the ambient or surface temperature is below 4°C or above 30°C or will be in that range for the 24-hour period after application. When hot, dry, or windy conditions exist, moist curing and protection must be provided. Material that is allowed to freeze or material that dries too quickly may suffer irreparable damage.

DO NOT add any other materials to the plasters used with the system or deviate from the mixing or application procedures outlined in any of Specialized Construction Product's technical data sheets without written approval from Specialized Constructions Products.

DO NOT apply any plaster material unless the substrate has been properly cleaned and prepared.

DO NOT add any more water than prescribed by the technical data sheet for the individual products.

DO NOT wet the wall prior to the application of any plaster.

DO NOT reactivate any plaster with more water once it has begun to set.

DO NOT mix more plaster than you can use in 45 minutes.

NOTE: Failure to follow the manufacturer's written specifications could result in the following but not limited to spalling, cracking, peeling, chipping, delamination, discoloration, wash off, and overall system failure.

28 Maintenance

Any paint film damage must be repaired as soon as possible to prevent water penetration and ensure that the high strength properties of the fibreglass mesh are maintained. Any impact damaged areas must be thoroughly cleared of any loose material and repaired with a 1:1 mixture of resin and water mixed with the required amount of Caviteclad plaster. This will ensure a positive bond between the original plaster and the repaired area. Repaint within the following week.

The wall cladding system should be regularly cleaned, at least annually, by washing with clean water to remove dirt and to maintain the finish appearance. Grime may be removed with warm water and detergent. Plastered walls should be recoated with an approved paint system at 5 to 8 yearly intervals or sooner if required to maintain weathertightness. Regular checks, at least annually, must be made

of the system to ensure that the weather resistant coating is maintained watertight, and that the sealant, flashings, and other joints continue to perform their function and do not allow water to penetrate. Failure to correctly maintain the system may void any long-term warranties offered with the system. Any accidental damage to the cladding must be repaired immediately using Specialized Construction Products materials. For further information with regard to maintaining and cleaning the Caviteclad EPS System please refer to Specialized Plaster Maintenance Guide.

29 Warranty

The recommendations, suggestions, statements, and technical data provided by Specialized Construction Products are based on the best current knowledge available and are given for

information purposes only without any responsibility for their use. It is expressly understood and agreed that the buyer's sole and exclusive remedy shall be the replacement of defective products, and under no circumstance, shall Specialized Construction Products be liable for incidental or consequential damages.

Specialized Construction Products neither assumes, nor authorizes, any others to assume for it any liability with respect to furnishing of the product. Handling and use of the products are beyond the control of Specialized Construction Products; therefore, no warranty is made, expressed or implied, as to the results or on-site quality that can be obtained from the use of the product. The long-term durability of the Caviteclad system is dependent upon the correct preparation and application of all its components in strict accordance with all the relevant written instructions and detail sheets. On-site application is beyond the control of Specialized Construction Products and it cannot guarantee workmanship or the correct preparation and application of its products or systems. The Certified Caviteclad contractor shall take the overall responsibility for, on-site supervision, staff training, installation, and quality control.

Material Guarantee Period

15 years from date of practical completion to plastering.

Workmanship Guarantee Period

5 years from date of practical completion to plastering.

Technical Assistance

Assistance and information are available by calling Specialized Construction Products on (09) 414 4499 or 0800 800 79 or by e-mail at info@specialized.co.nz.

Table 1: Thermal Rating

| | 50mm EPS&XPS | 75mm Thermashell R(m ² C/W) |
|--|-----------------|--|
| R _{se} (exterior surface resistance) | = 0.03 | = 0.03 |
| Layer 1 5mm Cement-based exterior plaster | = 0.01 | = 0.01 |
| Layer 2 Cladding substrate (derated by 45%) | = 0.86 | = 1.29 |
| Layer 3 For the frame area (studs @600 centres – dwangs @ 800) incorporating a R=1.8 wall batt | = 1.70 | = 1.70 |
| Layer 4 Internal 9.5mm Plasterboard Lining | = 0.05 | = 0.05 |
| R _{si} (interior surface resistance) | = 0.09 | = 0.09 |
| Total thermal resistance, RT | = 2.74 | = 3.17 |

Table 2: Caviteclad (50mm)

| NZS 3604 Wind Zone with studs at maximum 600mm centres | EPS Fixing Centres for Edges and Intermediate Studs |
|--|---|
| | 42mm washers |
| Low | 300 ¹ |
| Medium | 300 ¹ |
| High | 300 ¹ |
| Very High | 200 ² |

1. One fixing is required into each dwang and top and bottom plates at mid-dwang length.

2. Fixings are also required into each dwang at 200mm centres and top and bottom plates at mid-dwang length.

Table 3: Caviteclad (50mm)

| NZS 3604 Wind Zone Extra High and Specifically designed buildings up to 2.5 kPa design differential ULS wind pressure with studs at maximum 400mm centres (42mm diameter washers must be used in all situations) | | |
|--|---|--|
| Maximum vertical fixing centres along studs | Maximum horizontal fixing centres along top and bottom plates | Maximum horizontal fixing centres along dwangs |
| 150mm | 200mm | 150mm |

