

PUTZ TECHNIK®

MINERAL PLASTER TECHNOLOGY

SYSTEM 300

TECHNICAL MANUAL

Product Description and Installation Details

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**Putz-Technik
27A Neilpark Drive
East Tamaki
Auckland**

SYSTEM 300

System 300 is a Plastering System for external Polystyrene application, installed on an approved drained cavity comprising cement-based BREATHABLE mineral plasters, alkaline resistant fibreglass mesh and assorted PVC flashing and trims. The Polystyrene sheets are mechanically fixed over a nominal 20mm cavity to timber or steel framing.

System 300 is a three-coat plaster system incorporating embedded fibreglass reinforcing mesh and selected finish coats.

The main plaster component of System 300 is PT300 plaster, which provides a tough, durable and crack resistant base coat when used in conjunction with fibreglass reinforcing mesh.

BRANZ APPRAISAL

System 300 has been appraised by BRANZ as an external wall cladding system for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Building Wind Zones up to, and including 'Very High'.

System 300 has also been appraised as an external wall cladding system for steel framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, with regards to building height and floor plan area; and,
- constructed with steel framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Building Wind Zones up to, and including 'Very High'.

The Appraisal covers System 300 only when installed on vertical surfaces (except for tops of parapets, sills and balustrades, which must have a minimum 10° slope and be waterproofed in accordance with the Technical Literature). The system is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *(The performance of System 300 relies on the joinery meeting the requirements of NZS 4211 for the relevant Building Wind Zone.)*

BUILDING REGULATIONS

System 300, when installed and maintained according to the instructions and procedures recommended by Putz-Technik Products Ltd will meet or contribute to meeting the provisions of the New Zealand Building Code as required by: Clause B1 Structure: B2 Durability: C3 Spread of Fire: E2 External Moisture: E3 Internal Moisture: and H1 Energy Efficiency.

TECHNICAL SPECIFICATION

INSULATION BOARDS

EPS Boards - 40, 50 or 60 mm thick. Class H or Class S expanded polystyrene, manufactured to AS1366 Part 3, supplied in sheets ranging in length from 2.4 m up to 3.6 m. Sheets are typically 1.2 m wide.

FASTENERS

Timber Framing- Hot dipped galvanized flat head nails of the following sizes, fitted with 40mm diameter plastic washers: 40mm thick insulation board nail size 90 x 3.55 mm; 60 mm insulation board 110 x 3.8 mm.

Steel Framing - Self drilling AS3566 Corrosion Class 3 6-gauge screws in mild or moderate industrial or marine environments and Corrosion Class 4 6-gauge screws in severe marine environments, fitted with 40 mm diameter washers. Screw length to allow 10 mm penetration through framing.

SEALANTS

Putz-Technik recommends the use of BRANZ appraised sealant to reveal junctions, roof flashing extensions, wall penetrations, etc. Where gaps to be filled are substantial a PEF backer rod must be used to for the sealant joint.

PVC FLASHING AND ACCESSORIES

Sill and jamb flashings, and corner and base mouldings are supplied by Putz-Technik. Head flashings are supplied by the joinery manufacturer.

REINFORCING MESH

Hard and soft woven alkali resistant fibreglass mesh with a 4 x 4 mm mesh size weighing approximately 160 g/m² for domestic and light commercial situations.

AIRSEALS AND FLASHING TAPES

An airseal must be installed around all joinery openings to minimise the risk of airflows carrying water into the joinery cavity.

Prior to the joinery installation the building wrap must be cut and dressed into the opening and flexible sill and jamb tapes must be installed as shown in the installation details.

An airseal must be provided between the window or door joinery reveal and the building wrap and be taken around the reveal to completely seal the gap.

Airseals must be made from self-expanding foam over a PEF backing rod.

The sill trimmer must be flashed along its full length and the flashing must be turned up the opening framing a minimum of 200mm.

HANDLING AND STORAGE

Handling and storage of all materials during delivery or on site is the responsibility of the Putz-Technik Licensed Contractors. Bags of plaster mix require storage in dry conditions, preferably off the floor on pallets or dunnage. PVC extrusions and Polystyrene boards must be stored out of direct sunlight and in a location where physical damage is avoided. Discard any plaster that is 6 months beyond manufacture date.

PLASTER AND FINISH COATS

First Coat

PT300 is a factory mixed adhesive render and is suitable as a bonding and meshing coat on Polystyrene. PT300 is suitable for plastering machines or manual application (drill mixed only). On Polystyrene, PT300 is used as a mesh coat of approximately 3-4 mm thickness, thereby providing a bonding surface for further coats of plaster. PT300 is a non acrylic plaster with high water vapour permeability (breathing activity) containing only natural materials and additives.

- Technical - PT300 is manufactured using selected aggregates, cement and mineral additives. Sand and particle size range is 0-1.00mm. PT300 has high water vapour permeability (breathing activity).

Compressive Strength (N/mm ²)	10.0
Flexural Strength (N/mm ²)	4.54

Bond Strength (N/mm ²)	0.67
Water Demand (N/mm ²)	<0.5
Water Retention (%)	99%

Coverage – Depending on the substrate a 25kg bag of PT300 yields approximately 6 m² at 3-4 mm thickness.

Important:

Do not under any circumstances add foreign substances other than clean water to pre-mixed mineral plasters. Do not add further water to PT300/water mixture more than 2 hours after original mixing. Allow 24 hours drying time prior to applying further coats for plaster.

Storage

PT300 is packed in 25 kg plastic lined paper bags. PT300 can be stored in a dry place for up to 6 months

Second Coat

PT350 is an all-purpose skim coat render primarily designed as a leveling coat applied over a primary mesh coat or uneven surface. PT300 can also be laid up as a preparation coat, ensuring a high standard of finish for subsequent finishing coats. PT350 can be trowelled to a minimum thickness of 1 mm and is suitable for commercial plastering machines or manual application (drill mixed only).

Technical - PT350 is manufactured using selected aggregates, cement and mineral additives. Sand particle size range 0-1.0 mm. PT350 has high water vapour permeability (breathing activity).

Compressive Strength (N/mm ²)	>3
Flexural Strength (N/mm ²)	>2.05
Bond Strength (N/mm ²)	>0.3
Water Demand (N/mm ²)	>0.5
Water Retention (%)	99
Water Absorption Coefficient (Kg/(m ² .h ^{0.5}))	0.25

Coverage – Depending on the substrate a 25kg bag of PT 350 yields approximately 15m² at 2mm thickness.

Important:

Do not under any circumstances add foreign substances other than clean water to pre-mixed mineral plaster. Do not add further water to PT 350/water mixture more than 2 hours after original mixing. Allow 24 hours drying time prior to applying further coats of plaster.

Storage

PT350 is packed in 25 kg bags. PT350 can be stored in a dry place for up to 6 months.

Third Coat Finishes:

All Putz Technik plaster finishes are available standard for painting. To complement the breathing activity of its plaster coats Putz Technik recommends the use of vapour permeable -based exterior house paints which are used over System 300 plaster to give the desired finish colour to the exterior walls and to make the system weathertight. The chosen paint system must comply with any of Parts 7, 8, 9 or 10 of AS 3730. Paint colours must have a light reflectance value of 40% minimum regardless of gloss value. The systems must be applied in accordance with the paint manufacturer's instructions.

PT 100 – Adobe/Undulating

PT 100 is a factory mixed dry plaster and can be applied as a final coat on top of a base coat. PT 100 has been specifically formulated as a fine sponge finish and is ideally suited where an adobe or undulating finish is required.

PT 100 has high water vapour permeability (breathing activity) with excellent adhesion and has a favourable compression/flexural strength ratio.

PT 100 is suitable for commercial plastering machines or can be applied manually when mixed by drill or machine. PT 100 can be applied from 1 - 5 mm thickness, and during setting the applied areas may be sponged or brushed with water to achieve the required finish. PT 100 can be easily worked to any desired effect, from bold rustic and undulating textures to smooth sponge finishes. It may, depending on the straightness of the base coat, be necessary to apply two coats of PT 100. Depending on the substrate and the desired texture, a 25 kg bag of PT 100 yields approximately 7 m² at 2 mm thickness.

PT 101 – Float/Sponge/Texture

PT 101 is a factory mixed dry plaster and can be applied as a final coat on top of a base coat. PT 101 has been specifically formulated for finishing by plastic trowel or sponged with water. PT 101 can also be sprayed through a hopper gun to achieve a fine to medium textured finish.

To achieve a high quality finish Putz Technik recommends that PT 101 top-coat be preceded by a skim coat of either PT 350 or PT 101. PT 101 is applied manually when mixed by drill or machine and can be applied to a minimum thickness of 1.0 mm. Optimum working time is approximately 3-5 minutes following application to wall surface. PT 101 yields approximately 14-16 m² at 2 mm thickness.

PT 103 – Scratch/Drag

PT 103 is a factory mixed dry plaster and can be applied as a final coat on top of a base coat. PT 103 has been specifically formulated as a medium texture (drag or random scratch coat). Grain size varies from 0.5 - 3 mm to produce the required texture pattern.

During setting the applied areas are worked with a polystyrene or hard plastic float in circular or vertical directions. PT 103 has high water vapour permeability (breathing activity). Depending on the substrate a 25 kg bag of PT 103 yields approximately 6 m².

PT 104 – Scratch/Drag

PT 104 is a factory mixed dry plaster and can be applied as a final coat on top of a base coat. PT 104 has been specifically formulated as a coarse scratch or drag finish. Grain size varies from 0.5 - 4 mm to produce the required texture pattern. During setting the applied areas are worked with a polystyrene or hard plastic float in a circular or vertical direction. PT 104 has high water vapour permeability (breathing activity). Depending on the substrate a 25 kg bag of PT 104 yields approximately 6 m².

SPRAY TEXTURES

PT 300, PT 101, PT 102, PT 100 can be sprayed through a hopper gun or similar to produce varying grades of textures from fine to very coarse. Variations are produced by sand particle size, nozzle size and varying air volume.

For further information contact Putz Technik.

DESIGN INFORMATION

General: System 300 is a breathable insulating wall cladding system installed over a

nominal 20mm cavity to exterior timber or steel framing. The structure supporting the cladding must be designed and constructed to meet the relevant performance criteria of the New Zealand Building Code. Wall studs must be at 600mm maximum centres, with dwangs at 800 mm centres maximum. Designers must ensure that structures do not contain detail or design features where water ponding will occur.

A minimum slope of 10 degrees is required to all sills and copings, and where necessary a waterproof membrane system or water management facility is to be specified.

Punchings in the ventilated cavity closure provide a minimum ventilation opening area of 1000 mm^2 per lineal metre in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3(b).

Putz Technik recommends the use of breather type building wrap in keeping with the vapour permeability characteristics of the plaster coats. 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. Where rigid sheathings are used, the fixing length must be increased by a minimum of the thickness of the sheathing.

Where penetrations through System 300 are wider than the cavity batten spacing, allowance must be made for airflow between adjacent cavities. A minimum 10 mm gap must be left between the bottom of the vertical cavity batten and the flashing to the opening.

Weather proofing around aluminium joinery openings, penetrations, construction and expansion joints, base and wall junctions must be given particular attention by designers and installers.

The bottom edge of the finished polystyrene must be kept clear of paved ground, such as footpaths and mowing strips, by a minimum of 100 mm and unpaved ground by a minimum of 175 mm. The ground clearances to finished floor levels as set out in NZS 3604 must be adhered to at all times. Adherence to these requirements is the responsibility of the owner / builder.

Building Wind Zones:

System 300 is suitable for construction in all NZS 3604 defined Building Wind Zones, up to and including Very High. When fixed in accordance with the technical instructions of Putz Technik, System 300 will meet the requirements of NZS 3604.

EPS sheets must be fixed through the cavity battens and cavity spacers to the wall framing at centres specified in Table 1.

Table 1: EPS Sheet Fixing Centres for Edges and Body of Sheet

NZS 3604 Building Wind Zone	Fixing Centres (mm)
Low	300 mm ¹
Medium	300 mm ¹
High	300 mm ¹
Very High	200 mm 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 200 mm centres and top and bottom plates at mid-dwang length.

Impact Resistance:

System 300 employs the use of alkali resistant 160 g/m² reinforcing mesh for residential and light commercial applications. Consideration must be given to the impact resistance required in commercial applications.

Durability:

When installed and maintained in accordance with the instructions and recommendations of Putz Technik, System 300 will meet the provisions of NZBC B2.3.1 (b) 15 years.

Maintenance:

Putz Technik recommends regular checking of the system (at least annually) for cleanliness and integrity of the applied finish coatings. Washing with detergent and warm water will remove most dirt or grime build-up not washed away by rain. Checks must also be made of sealant applications and flashed joints to ensure that weather-tightness has been maintained. Unstable or suspect areas must be stripped out and the sealant and/or plaster replaced. Putz Technik supply plaster and technical support to assist with any repair work.

Outbreak of Fire:

System 300 must be separated from heating appliances, fireplaces, chimneys and flues in accordance with the requirements of Acceptance Solution C/AS1 Part 9 for the Protection of Combustible Materials.

Spread of Fire:

When installed in accordance with the instructions of Putz Technik, System 300 using any surface finish is considered to meet the performance provisions of NZBC C3.3.5 for use as an external wall cladding when restricted to:

- Single storey buildings 1 m or more from the boundary for all purpose groups.
- Buildings up to 7 m high, 1 m or more from the boundary, for all purpose groups other than SC and SD.
- Fully sprinklered buildings up to 10 m high, 1 m or more from the boundary for all purpose groups other than SC, SD, SA and SR.
- Buildings containing purpose group SH, with a building height less than 10 m and located 1 m or more from the boundary.

Where buildings are of the three floor maximum permitted by NZBC Acceptable Solution E2/AS1, Paragraph 1.1 (a), and when System 300 extends to cover the walls of all three floors, the requirements for barriers to vertical fire spread in the EPS as set out in NZBC Acceptable Solution C/AS1 Part 7, Paragraphs 7.9.18 and 7.9.19 must be met. Design of the barrier joint must be specifically detailed by the designer to meet the NZBC, including blocking of the cladding cavity and wall framing cavity, and installation of flashing and sealing systems to collect and direct any moisture to the outside of the cladding system at this point.

External Moisture:

When installed in accordance with the instructions of Putz-Technik, System 300 will meet the performance requirements of NZBC E2.3.2.

Junctions between the cladding and the external joinery, at control joints and around window penetrations must be detailed to ensure the cladding system is installed and maintained weathertight.

Sills, parapet tops and balustrades must be sloped a minimum of 10° from the horizontal if a plaster finish is required to these areas. However, in the case of parapets and hand rails the use of metal cappings is recommended.

The bottom edge of the insulation boards must over-lap past the edge of the concrete floor, wall plate or bearer by a minimum of 50 mm.

Weathertightness Principles

Joinery heads must be protected by a flashing.

In all Building Wind Zones, internal air seals are required around all penetrations installed in the gap between the reveal and framing at the line of the internal framing.

Jambs must be sealed and utilize a jamb flashing system for recessed joinery. These must be installed on the face of the cavity batten.

Sills of recessed systems must use a sill flashing which is installed on the face of the cavity sill packers. Where a rigid sill flashing cannot be used, such as for circular type windows

and the like, the sill must be sealed with a flexible flashing tape or purpose made extrusion. A BRANZ Appraised sealant must be used to make weathertight seals between the joinery and the cladding, around holes for services and at junctions with dissimilar materials. The sealant manufacturer's instructions must be followed for application.

Internal Moisture and Energy Efficiency

DBH and BRANZ have determined that up to 50% of the polystyrene R-value may be lost due to the installation of a ventilated cavity, therefore there is a requirement for bulk insulation to be installed in the framing cavity to ensure compliance with the requirements of the NZBC. Future verification of R-value loss may result in alternative recommendations.

NZBC E3/AS1 Paragraph 1.1.1(a) requires a wall R-Value of 1.5 for framed wall construction and Paragraph 1.1.1(b) requires a wall R-Value of 0.6 for masonry construction.

Water Vapour

System 300 comprises plaster coats which have high water vapour permeability (breathing activity). System 300 is not a barrier to the passage of water vapour, and when correctly installed, will not create or increase the risk of damage resulting in condensation.

Hazardous Building Materials

When System 300 is used and installed in accordance with the instructions and technical literature of Putz Technik, the product will not present a health hazard to people; therefore the provisions of NZBC F2.3.1 will be met.

Electrical Cables

PVC sheathed electrical cables must be prevented from direct contact with the polystyrene.

When cables must penetrate the polystyrene board for exterior electrical connections the cable must be supported immediately behind the board by passing through a hole drilled in a framing member.

Control Joints

The Technical Manual provides details for the formation of control joints.

Control joints shall be provided on all walls over 20 metres long and 6 metres high unless specified to be at more frequent intervals by the Designer; where EIFS cladding covers different structural materials, like wood to concrete; at abutments to different cladding

materials, and over movement control joints in the underlying structure.
Control joints shall always be located over structural supports.
Where applicable Designers must specify location of all construction joints.

Inter-storey Drained Joints

Inter-storey drained joints must be provided for walls over 2 storeys in height in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4(b).

INSTALLATION INFORMATION

Installation must be in accordance with the instructions of Putz-Technik, which are contained in the technical literature. Only Approved Contractors assessed and approved by Putz Technik may carry out the installation of System 300.

Building Wrap and Flexible Sill and Jamb Tapes

The selected building wrap and flexible sill and jamb tape system must be installed by the building contractor in accordance with the wrap and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of System 300. The building wrap must be installed horizontally and be lapped 75 mm minimum at horizontal joints and 150 mm over studs at vertical joints. Particular attention must be paid to the installation of the building wrap 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.

Ventilation and Drainage Cavity:

Joinery reveals must be sized to allow for the framing and cavity width, plus 2-3 mm extra to allow clearance to fit the sill and jamb flashings.

Head flashings must be wide enough to allow for fixing the rear upstand directly to lintels. The head flashing upstand must be flashed to the building wrap with flexible tape.

Flashing tape systems must be installed prior to the joinery installation.

Vertical battens must be fixed to framing with 30 mm clouts to all studs, and horizontally at the soffit level.

Packers 100 mm maximum long must be fixed on nogs to provide for fixing of the polystyrene in accordance with Table 1.

Where the studs are spaced at greater than 450 mm centres, polypropylene strapping must be firmly stretched and fixed at mid dwang between each stud (prior to the packers) to prevent the building wrap bridging the cavity during installation of any internal bulk

insulation.

Cavity battens around joinery openings must be installed in accordance with the technical details to ensure sill and jamb flashings are installed on the outer plane of the cavity.

Joinery heads must be finished with the PVC angle with drainage holes as set out in the technical literature to allow drainage of the head flashing area.

Fixing of Insulation Boards:

Recessed joinery, including all flashings must be fixed in place prior to fixing the polystyrene boards.

All sheet edges must be supported and fixed to battens on framing except at the base where they can hang 50mm below the supporting framing. Additional framing may be required at soffits, around openings and at internal corners for the support and fixing of battens and sheet edges.

Fixing centres for Very High Wind Zones must not be more than 200 mm maximum centres around door and window penetrations, and around the edges and in the body of the sheet in Very High wind zones, otherwise all other fixings are at 300 mm maximum centres.

Plastering:

PVC flashings, trims, profiles and control joints must be installed prior to plastering.

Joinery, soffits, decking, paving and any other finished surfaces within close proximity to the plastered areas are to be masked for protection from splashes or over-spray.

Surface “humps” in the polystyrene due to minor variations in wall framing can be removed by sanding or shaving prior to plastering.

Where polystyrene has been exposed to sunlight over a long period, the resultant yellow powdering caused by oxidation must be removed by sanding or brushing.

System 300 can only be applied when the temperature range is between 5° - 30°C.

Initial set occurs after 12 hours on the wall in which time the plaster coats will stabilise sufficiently to withstand the impact of light rain.

PT300 mesh coat is to be applied at 2-3 mm thickness, in bands of 1.0 m, 1.2 m or 1.3m depending in the width of the reinforcing mesh used. When trowelling mesh into PT300 ensure that the fibreglass mesh is trowelled in such a way that it remains to the exterior surface of the plaster and that it is over-lapped at least 100 mm where it is joined. Diagonal reinforcing strips must be applied at all corners of windows, doors and other exterior openings.

A skim and leveling coat of PT350 must be applied at a minimum thickness of 1.0 mm once the mesh coat has set sufficiently, and prior to the application of a finish coat.

Plastered surface must be protected from rain, sunlight and drying winds for at least 12 hours after application.

Phone: (64)09 271-3504 Fax: (64)09 271-3505
www.putz-technik.co.nz

Phone: (64)09 271-3504 Fax: (64)09 271-3505
HYPERLINK "http://www.putz-technik.co.nz" www.putz-technik.co.nz
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