PERMASTONE

INSTRUCTION MANUAL

PRODUCT CODE: PS 01-17

DESCRIPTION AND USES

Permastone is a natural stone coating incorporating marble, epidote and granite aggregates encased in a waterbased acrylic binding system.

The Permastone coating provides a highly protective decorative finish that can be applied to both walls and floors, externally and internally.

Substrates suitable for coating with Permastone virtually includes all sound surfaces capable of supporting the weight of the coating. For walls these include; tiltups, render, bricks, blocks, hebel blocks, fibroboard, gyprock , polystyrene wall cladding, metal, masonite and in the case of flooring; concrete, timber, tiling etc.

It is available in 17 individual colours that can also be blended in varying ratios to create a desired effect and colour.

Desired effects extend from 'off the gun' raw finishes to polished finish 'spray and trowel' effects.

COMPOSITION AND MATERIALS

The Permastone coating involves a three stage process including priming, coating and final sealing – all of which are enviromentally friendly waterbased systems.

PRIMER: Based on a water-borne acrylic polymer, it's a fast penetrating superfine 'breathing' waterproof sealant / tack coat primer with outstanding adhesion to calcareous and noncalcareous substrates, whilst also exhibiting excellent alkali resistance, important in long term performance over masonry substrates.

COATING: The Permastone acrylic binding system not only provides the coating with waterproofing, uv stabilisation and briliant flexibility qualities, but also its' high clarity enhances the natural colouring of the aggregates. This binding system also incorporates fungicides to inhibit microbiol attack and preservatives to ensure a long shelf life.

The aggregate partical sizing is in the range –1mm to + 0.25mm to ensure constant coverage rates.

SEALER: A quick penetrating and fast drying acrylic sealant with excellent adhesion, mechanical abrasion resistance and uv stabilisation to further enhance both asthetic and longetivity properties of Permastone.

COLOUR LIMITATIONS

Being a naturally mined aggregate colours can vary slightly from one site in the quarry to the next . Therefore the total materials for a project should be ordered at the one time to ensure the same batch number and therefore uniformity of colour.

Permacolour cannot accept responsibility for colour variations if this ordering procedure is not followed.

Permastone is manufactured and supplied in 17 individual colours. Combinations or mixes of these separate colours to achieve a desired affect is the responsibility of the contractor.

The colour range may also be restricted at times when the quarry is sourcing new deposits.

SUITABILITY

The unique properties of the total Permastone system is demonstrated in its ability to be used in both wall and flooring applications.

For walls, the Permastone system exhibits all properties needed for succesful long term performance by providing superior adhesion, flexibility, low water absorption, resistance to natural weathering, high tensile strength with 16% elongation before fracture and most importantlly water vapour transmission ability, so that the coating can 'breathe' and not delaminate due to hydrostatic pressure build-ups in the substrate.

These attributes are further enhanced in flooring applications by Permastone also achieving above average Rockwell, Pencil and Mohs scale hardness results; the coating therefore withstanding high mechanical abrasion in the form car tyres, high pedestrian traffic loads etc.

Permastone also posesses the ability to tape patterns on the substrate and successfully pull them up during the curing cycle and achieving clean edges.

All the above Testing procedures, specifications and results are listed further on in this manual.

ADVANTAGES

- **Large range of uses interior/exterior, walls and floors.**
- **Environmentally friendly total water-based system.**
- **Natural decorative finish.**
- **Highly flexible nature minimises preparation work needed.**
- **Creates a strong flexible coating that will not crack, shed or flake.**
- **Unaffected by vibration and temperature related expansion/contraction.**
- **Can withstand climatic extremes and varying forms of abrasion; from wind and driving rain on walls to vehicular traffic on the ground.**
- **Natural aggregate colouring negates uv fading effects.**

SURFACE PREPARATION

Before proceeding with surface preparations, you should ensure that the substrate you are coating is of a sound nature, stable and in the case of walls, properly fixed.

All surfaces must be clean, dry and free of contaminates that could affect adhesion and bonding strengths of subsequent coatings.

Surface cracks and holes should be sealed then smoothed and left to dry.

CONCRETE:

New concrete should be left to cure for 3-4 days before coating.

In the case of flooring, acid etching followed by waterblasting is the best preparation after any forms of contamination are removed.

With tiltup panels for wall coating, ensure that any form releases or oils are removed.

Any imperfections in concrete finishes should be patched with Permacolour Skimcote and allowed to dry.

BRICKS / BLOCKWORK:

In order to work off a flat straight surface, brick and block work should first be rendered with Permacolour Rendercoat. If not, the spraying of the Permastone coating will simply follow the profiles of any underlying pattern.

APPLICATION

PRIMER:

Permastone Primer is suitable for priming all surfaces.

Make sure the surface is dry and surrounding areas are protected from oversprays; clean up immediately with water and a sponge.

Care must be taken to ensure the surface is clean and sufficient drying and hardening time has been allowed for with previous coatings or repair areas.

Coverage: 20 litre pail will cover approximately 100m2 when applied as a two coat system using 0.1litre/m2/coat.

Dilution should not be necessary.

Coverage rates and number of coats needed will be dependant upon surface porosity.

Porous, high suction and wall substrates need to be two coat processes. The first coat on these substrates should be allowed to dry before applying the second coat. This second coat should be applied, in wall coating situations, at time periods where the primer film is partially dry but still tacky when the main coating is to be applied.

Due to the high clarity of the cured Permastone resin, some colours can have a 'see-through' or translucent appearance. The primer can therefore be tinted (with Permacolour w/b tinter range) to a colour similar to that of the stone aggregate so ensuring full opacity and better coverage rates.

PERMASTONE:

Do not wait for the primer to completely dry; apply coating whilst primer is still tacky.

Make sure all areas outside the spray area are well protected from overspray.

Dividing lines in colour changes or taped masking lines can be used as they will detape neatly.

The Permastone material should be vigorously stirred when opened to ensure uniform consistency throughout, as the resin tends to float to the top after standing for long periods.

Protect partially used pails from contact with the air by replacing lid otherwise a resin skin will form.

Coverage: 20 litre pail will cover between 8-9m2. Using suitable spray equipment, spray in a uniform pattern at the rate of 2.5 litres /m2.

For walls, spray from top to bottom, avoiding cold joints. For the best results, spray as a two coat system, the first coat covering 40-50% of the total surface, the second coat completeing 100% coverage. The two coat process ensures avoiding material slump from too great a film thickness in one application.

The two coat process is also recommended on flooring applications as it is difficult to determine if you have full coverage of the substrate until the resin clears in colour as it dries.

The quality of the finish in relation to texture and profile will be affected by spray pressure and nozzle distance from the surface.

A polished look finish can be achieve by trowelling and 'closing up' the surface matrix within 10 minutes of spraying the material. Use a plastic trowel as overtrowelling with steel will 'burn' the resin leaving burnished or dark marks. Clean the trowell face regularly with water or wipe with a damp sponge, as a thin resin film picked up on the trowel face will dry rapidly and consequently 'pull and tear' the coating as it is trowelled.

Permastone, depending on drying conditions, will harden to a medium level outdoors in 1-2 hrs and indoors in 2-3 hrs. It is within this curing time frame that any patterns created by taping or stencilling should be removed in order to achieve 'clean' edges.

Full cure will take approximately 48 hours in average drying conditions.

Any overspray or spillages should be cleaned up with water immediately.

Spray Equipment specs:

- **Nozzle size : 5 – 8 mm**
- **Pressure: 40 – 60 psi**
- **Spray distance from surface: 40 – 50 cm**

SEALER:

Once the Permastone coating has had sufficient drying time that it displays clarity in the resin film and cannot be displaced with finger pressure, it is ready to be sealed.

Apply sealer by spray, brush or roller as a two coat process at the rate of 7-8m2 /litre.

Coverage: 20 litre pail will cover approximately 150m2.

Permastone coatings applied in flooring applications can be overcoated with more durable sealers for high traffic area performance. See your Permacolour distributor to help you choose the appropriate sealer for your particular application.

Completed Permastone works should be protected from rain, dust and adverse weather conditions for at least 48hrs.

See MSD sheets for information on Storage, Safety and Handling.

PERMASTONE

TESTING PROCEDURES & RESULTS

1. 'STANDARD TEST METHOD FOR WATER VAPOUR TRANSMISSION OF MATERIALS'.

- **DATE OF ISSUE:** **20 October 2000**
- **REPORT NO:** **MCGOO-4098-05**
- **TEST SPECIFICATION:** **ASTM E96-80**
- **PROCEDURE:** **Permeation tests were performed in accordance with ASTM E96 using the Permastone coating on a fibreboard substrate as the test material. The coating and substrate was 7mm in thickness. The coating had a resin content of 23%. The water method was used at a test temperature of 23 degrees C with a relative humidity of 50%. The sample was orientated to have the water on the coated side of the substrate. A 76mm diametre beaker was used as the test cup and the sample sealed using wax and silicon sealant.**
- **RESULTS:**

WATER VAPOUR TRANSMISSION RATE (g/hr. m2)	PERMEANCE (g/Pa.s.m2)
1.37	2.62E-07

2. PAINTS AND RELATED MATERIALS – METHODS OF TEST – RESISTANCE TO NATURAL WEATHERING.

- **DATE OF ISSUE:** **15 JANUARY 2001**
- **REPORT NO:** **MCG00-4098-06**
- **TEST SPECIFICATION:** **AS 1540.457.1**
- **PROCEDURE:** **Samples of the Permastone coating were prepared on a fibreboard substrate as specified. These samples were then exposed using an 'Áltac' exposure system which increases the exposure up to a factor of 4. The results are ranked on a scale with 0 indicating the original condition and the higher the number, the greater the degredation.**
- **RESULTS:**

Exposure time (months)	General Appearance	Discolouration	Colour change
1	0	0	0 – trace lighter
2	0	0	0 - trace lighter
3	1	1	1 – lighter

3. ADHESION – PULL-OFF TEST

- **DATE OF ISSUE:** **10 OCTOBER 2000**
- **REPORT NO:** **MCG00-4098-01**
- **TEST SPECIFICATION:** **AS 1580.408.5**
- **PROCEDURE:** **Adhesion test were performed as per AS 1580.408.5 on Permastone applied to a fibreboard substrate. The loading fixtures were attached using 'EPIREZ 712 'two part adhesive with a specified cure time of 6 hours. Adhesion tests were performed after 48 hours at 23 degrees C with the substrate orientated in a horizontal position. An Elcometer 106 Adhesion tester was used.**
- **RESULTS:**

Adhesion Results (kg/cm2)					Average Adhesion	Standard
Test 1	Test 2	Test 3	Test 4	Test 5	Force (kg/cm2)	Deviation
5.0	5.0	3.0	4.0	4.0	4.2	0.84

Adhesion Test Failure Locations

Test 1	Test 2	Test 3	Test 4	Test 5
10% primer	5% primer	100% coating	10% substrate	10% substrate
90% coating	95% coating		90% coating	90% coating

4. HARDNESS MEASUREMENT OF COATING

- **DATE OF ISSUE:** **10 OCTOBER 2000**
- **REPORT NUMBER:** **MCG00-4098-02**
- **TEST SPECIFICATIONS:** **AS 1580.405.1 – 1996 , ASTM D 785 01989**
- **PROCEDURE:** **The samples of Permastone were tested in accordance with AS 1580.405.1 and ASTM D785 to determine the hardness of the coating. The substrates were fibreboard and coated with Permastone. The coating was approximately 3mm in thickness with a total sample thickness of 12mm.**

  Staedtler leads were used for the hardness measurement.

  The Rockwell hardness test used procedure A and the H scale (3.125mm ball, 60kg load).

  A further hardness test was undertaken using the Mohs' hardness scale.
- **RESULTS:**

  The pencil hardness of the coating samples was 7H

  Mohrs'hardness testing indicated a coating hardness of 6 (out of 10)

R ockwell Hardness Testing: ROCKWELL READING	AVERAGE HARDNESS (RH)	STANDARD DEVIATION
16, 18, 16, 17, 12	15.8	2.3

5. DETERMINATION OF TENSILE PROPERTIES OF PLASTIC MATERIALS.

- **DATE OF ISSUE:** **10 OCTOBER 200**
- **REPORT NO:** **MCG00-4098-03**
- **TEST SPECIFICATION:** **AS 1145 - 1989**
- **PROCEDURE:** **Tensile test were performed as specified in AS 1145 on samples of the Permastone coating. Type 1 specimens were used and tested at a cross head speed of 5mm/min. Conditioning of the samples was undertaken for 40 hours 23 degrees C.**
- **RESULTS:**

	TENSILE STRENGTH AT MAXIMUM FORCE (kPa)	ELONGATION AT FRACTURE (%)
Average	**327**	**16**
Standard deviation	**18.1**	**2.4**

6. STANDARD TEST METHOD FOR WATER ABSORPTION

- **ISSUE DATE:** **10 OCTOBER 2000**
- **REPORT NO:** **MCG00-4098-04**
- **TEST SPECIFICATION:** **ASTM D 570**
- **PROCEDURE:** **Specimens of the Permastone coating were tested in accordance with ASTM D570. Water immersion was undertaken for 24 hours as specified in the standard. Conditioning temperature was 110 degrees C for 1 hour.**
- **RESULTS:**

	% INCREASE IN WEIGHT	% SOLUABLE MATTER LOST	TOTAL % LOST
Average	**15.53**	**0.37**	**15.90**

No warpage, cracking or other visible changes were observed during the testing process.