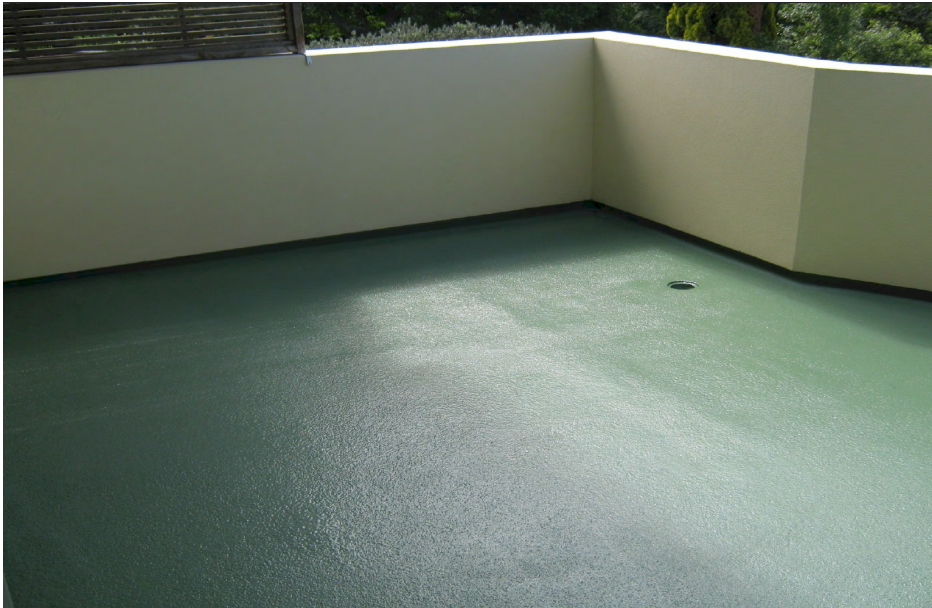




# BEAL Appraisal Certificate

## Vortex® Sprayliner System



### Product

- 1.1 The Vortex® Sprayliner System is a liquid applied, moisture cured plural component waterproofing system with an integral aggregate wear layer to be used on external pedestrian decks and balconies, and can be used for flooring and tanking.
- 1.2 The system consists of a basecoat (Vortex® Liner) and a top coat (Granitex Glaze System).

### Building Regulations

- 2.1 In the opinion of BEAL, The Vortex® Sprayliner System, if designed, installed and maintained in accordance with the statements and conditions of this Appraisal Certificate, will meet the following provisions of the NZBC.
- 2.2 Clause B2 DURABILITY  
Performance B2.3.1 (b), 15 years. The Vortex® Sprayliner System meets this requirement. See paragraph 8.1-9.4.
- 2.3 Clause E2 EXTERNAL MOISTURE  
Performance E2.3.2. Decks/roofs and balconies featuring The Vortex® Sprayliner System meet this requirement. See paragraphs 10.1 to 10.8.
- 2.4 Clause F2 HAZARDOUS BUILDING MATERIALS  
Performance F2.3.1. The Vortex® Sprayliner System meets this requirement and will not present a health hazard to people.
- 2.5 The Vortex® Sprayliner System has been appraised as an **Alternative Solution** in terms of New Zealand Building Code compliance.

Applicant:



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The most up to date version of this BEAL Appraisal Certificate can be viewed at [www.beal.co.nz](http://www.beal.co.nz)

## Scope and Limitations

3.1 The Vortex® Sprayliner System has been appraised for use as a waterproofing membrane for buildings within the following scope:

- Scope limitations of NZBC Acceptable solution E2/AS1, Paragraph 1.1; and,
- With building structures designed and constructed to comply with the requirements of the NZBC; and,
- With decks and balconies constructed with timber framing with substrates of plywood or fibre cement compressed sheet; and,
- With substrates of suspended concrete slabs
- Situated in wind zones up to, and including 'Very High' as per NZS 3604 Building Wind Zones
- With decks that have a maximum size of 40m<sup>2</sup>

3.2 The Vortex® Sprayliner System has also been appraised for use as a waterproofing membrane for pedestrian decks and balconies on specifically designed buildings within the following scope:

- With building structures designed and constructed to comply with the NZBC; and,
- With decks and balconies constructed with timber framing with substrates of plywood or fibre cement compressed sheet; and,
- With substrates of suspended concrete slab; and,
- With the design of all junctions (weather tight) being specifically designed by the designer; and,
- With the reinforced concrete structure designed and constructed in accordance with the NZBC.

3.3 This Appraisal Certificate is limited to decks and balconies within the following scope:

- Constructed with suitable falls (paragraph 11.2)
- With the membrane basecoat continually protected from exposure to UV (ultra violet) light and physical damage by the application of the Granitex Glaze System (top coat) with integral aggregate.
- With no steps within the deck level, no integral roof gardens and no down pipe discharging directly onto the deck.

3.4 The design and construction of the substrate and control joints is to be to specific design, and is therefore the responsibility of the owner/building designer and building contractor and is outside the scope of this Appraisal Certificate.

3.5 The Membrane system must be installed by Integrated Protective Coatings Ltd approved and trained applicators.

## Technical Literature

4.1 The **Vortex® Sprayliner System Technical Literature** (Ver 1.1 May 2011) must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the Technical Literature and scope of this Appraisal Certificate must be followed.

4.2 For a copy of this Technical Literature and any subsequent updates please refer to [www.ipcnz.co.nz](http://www.ipcnz.co.nz)

## Technical Specification

5.1 Materials and accessories supplied by Integrated Protective Coatings Ltd are as follows:

- **Vortex® Super Sealer**

Super Sealer is a two part epoxy sealer designed for use over a variety of substrates. It is supplied in a 3.79 litre kits.

- **Vortex® Liner (Basecoat)**

The Vortex Liner is a hot liquid applied plural component (resin and activator) formulation, which hardens within a few seconds after application. The Vortex resin and Activator are both supplied in 18.95 litre plastic pails. The two products are mixed using the Vortex Spray system and spray applied.

### Granitex Glaze System

5.2 This is a polyphatic glaze, two component blend of polyurea base resin and aliphatic urethane. The Granitex Glaze system comprises of;

- **Granitex Colour**

This is a two component (Granitex Colour resin and Granitex Activator) polyphatic glaze. This is applied by roller over the Vortex® Liner basecoat It is supplied in 3.79 litre kits.

- **Granitex Clear Glaze**

This is a two component (Granitex clear resin and Granitex Activator) polyphatic glaze. This is applied over the Granitex Colour glaze with granules. It is supplied in 3.79 litre kits or separately as 37.85 litre plastic pail of Granitex Clear Resin and 18.93 litre plastic pail of Granitex Activator.

- **Granitex Granules (aggregate)**

Granitex granules are ceramic fired beads available in 10 colours which are sprinkled onto the wet coat of Granitex Colour. It is supplied in 1/2, 1.89 or 3.79 litre plastic containers.

5.3 Refer to Paragraphs 14.1-14.6 and the Technical Literature for the method of application.

### Accessories

- **Trimming Tape**

Wiretrim® TrueLine is a thin transparent, doubled sided edge cutting tape with a high-tensile metal wire filament embedded into the tape. The tape is used to achieve a clean cut round the edge of the sprayed area. Supplied in 1/4 inch wide 100 foot long rolls.

- **Vortex® Vertical Sealant (VVS)**

Vortex® Vertical Sealant (VVS) is a plural component (resin and activator) formulation based on the same derivatives as the Vortex Liner material. Vortex® Vertical Sealant is packaged in a dual cartridge designed to fit into a proprietary application gun.

## Handling and Storage

5.4 All products must be stored inside, in a well ventilated area, up off concrete floors, kept dry, out of direct sunlight and away from freezing conditions. The membrane products, in the original unopened containers, have a shelf life of 12 months from date of manufacture. Once opened, the product should be used immediately.



# Design Information

## General

- 6.1 The Vortex® Sprayliner System is for use on decks and balconies where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.
- 6.2 The basecoat (Vortex® Liner) must be protected from exposure to UV light and physical damage by the Granitex Glaze Topcoat System with integral aggregate (Granitex Granules).
- 6.3 Movement and control joints may be required in the floor, depending on the shape of the deck.
- 6.4 Timber framing must comply with NZS 3604:1999, or where specific design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604:1999, or comply with the serviceability criteria of AS/NZS1170. In all cases framing must be provided so that the maximum span specified by the substrate manufacturer is met and all sheet edges are fully supported. Timber framing supporting the substrates must be constructed such that the deflections do not exceed 1/600th of the span.
- 6.5 The Vortex® Sprayliner System has been tested to AS/NZS 3661.1 and AS/NZS 4586 and has a slip resistance of 0.77 $\mu$  which exceeds the minimum slip resistance requirement of 0.4 $\mu$ , as specified in NZBC D1/AS1 paragraph 2.1.1.

## Substrates

### Plywood

7.1 Plywood must be treated to H3.2 (CCA treated). **LOSP TREATED TIMBER MUST NOT BE USED.** Plywood must comply with NZBC Acceptable Solution E2/AS1 paragraphs 8.5.3 and 8.5.5.1. Where specific design is required, the plywood thickness may increase and centres may need to be reduced to meet specific wind loadings.

### Fibre Cement Compressed Sheet

7.2 Fibre cement compressed sheet must be manufactured to comply with AS 2908.2 and suitable for use as an external decking substrate as specified by the manufacturer. The fibre cement sheet must be of sufficient thickness to meet specific structural design requirements and secured to the structure to resist wind uplift and other forces acting upon the deck and balcony (deflection from gravity and live loads). Installation must be in accordance with the instructions of the manufacturer.

### Concrete

7.3 Concrete substrates must be to a specific Engineered design, meeting the requirements of the NZBC. E.g 3101

## Durability– Clause B2

8.1 The Vortex® Sprayliner System when used in accordance with this Appraisal Certificate and subjected to normal conditions of environment and use, is expected to have a serviceable life of at least 15 years.

## Maintenance

- 9.1 No maintenance of the base coat (Vortex® Liner) is required provided that there is no significant substrate movement and the Granitex Glaze System (topcoat) with aggregate remains intact.
- 9.2 Regular checks must be made of the Granitex Glaze topcoat to ensure it is sound and will not allow moisture to penetrate. Any cracks or damage to the topcoat system must be repaired immediately in accordance with The Vortex® Sprayliner System Technical Literature.
- 9.3 The coating shall be washed at least annually with low pressure cleaning with warm soapy water.
- 9.4 In the event of damage to the membrane, the surface finish must be removed and the membrane repaired by removing the damaged portion and re-applying a patch as for new work.
- 9.5 Drainage outlets must be maintained to operate properly and surface finishes must be kept clean. Cleaning materials that affect polyurethane based membranes must not be used.

## External Moisture - Clause E2

- 10.1 Decks and balconies must be designed and constructed to shed any precipitated moisture. They must also take into account the effects of snowfalls in snow prone areas. *Refer to E2/AS1 for design requirements.*
- 10.2 The minimum fall to decks, balconies and gutters must be 1 in 60 and falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane system.
- 10.3 Since The Vortex® Sprayliner System is impermeable, therefore a means of dissipating construction moisture must be provided within the building design and construction in order to comply with Clause E2.3.6.
- 10.4 Deck and Balcony falls must be built into the substrate.
- 10.5 Only drains with flanges approved by IPC and fitted with a grate or cage may be used. An overflow must be provided for all enclosed decks.
- 10.6 The design and construction of scupper and overflow outlet details and the application of The Vortex® Sprayliner System to them (scupper and overflow outlets) shall be subject to specific design and are outside the scope of this Appraisal Certificate.
- 10.7 The level of penetrations and up-stands of the tanking membrane must be above the level of any possible flooding caused by blockage of deck or balcony drainage.
- 10.8 The design of details not included within the Technical Literature are subject to specific design and are outside the scope of this Appraisal Certificate.

## Installation Information

### Installation Skill Requirement

11.1 Installation of the membranes must be completed by Integrated Protective Coatings Ltd approved and trained applicators who have experience in the application of waterproofing membranes and knowledge of waterproofing principles.

11.2 Installation of the substrates must be completed by a suitably skilled tradesperson with an understanding of deck and balcony construction, in accordance with instructions given within The Vortex® Sprayliner System Technical Literature and this Appraisal Certificate.

#### Preparation of Substrates

12.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be smooth and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents. All surface defects must be filled to achieve an even and uniform surface.

12.2 Concrete must have cured for minimum of 28 days and must have a relative humidity reading of less than 75% before membrane application.

12.3 The moisture content of a timber substructure must be a maximum of 18% with fibre cement and plywood sheet dry at the time of membrane application.

12.4 Substrates must be primed/sealed with Vortex® Super Sealer as per the Technical Literature and allowed to cure before the membrane is installed.

#### Membrane Installation

13.1 Installation must not be undertaken when the substrate temperature is below 10°C or if it is likely to drop below 10°C during drying/curing time. For Pedestrian traffic use allow 12 hours, and for Light vehicles allow 24hrs. Curing time may need to be extended for cool conditions. *(This is applicable to the application of the Vortex Super Sealer Product as well)*

13.2 The membrane must be installed as a basecoat (Vortex® Liner) at a rate as specified by the Technical Literature, and a topcoat (Granitex Colour) with aggregate (Granitex Granules) spread onto the wet coat, followed by a final layer of topcoat (Granitex clear).

13.4 The Vortex® Liner (basecoat) is mixed and spray applied using the Vortex® Spray System.

13.5 The Granitex Colour and Granitex Clear are each heated and mixed using the Granitex HD8000 unit. The Granitex Colour is applied by roller whilst the Granitex Clear is applied by way of the Granitex power squeegee.

13.6 Excess aggregate should be vacuumed or scrapped clear reducing any jagged areas before the finishing coat of Granitex Clear is applied.

#### Remedial Work

14.1 The installation of The Vortex® Sprayliner System over existing deck/balconies is subject to specific design and is the responsibility of the Integrated Protective Coatings Ltd approved and trained applicators and therefore outside the scope of the Appraisal Certificate.

#### Health and Safety

15.1 The safe use and handling of the membrane system products are provided in the Technical Literature. The products must be used in conjunction with the relevant materials safety data sheet for each membrane.

## Basis of Appraisal

BEAL use the compliance verification procedure to demonstrate compliance with the relevant clauses of the NZBC based on a risk analysis procedure. The following is a summary of the technical investigations carried out

#### Tests

16.1 The following testing of The Vortex® Sprayliner System has been undertaken by BEAL.

- The durability of the membrane system was assessed by way off
- Water absorption
- Hydrostatic test (static head of water resistance)
- Determination of the resistance to dynamic and static indentation (impact resistance)
- Assessment of Freeze Thaw
- Tensile strength
- Bond strength to substrate materials

16.2 Testing by OPUS laboratories has been undertaken to determine slip resistance in accordance with AS/NZS 3661.1:1993 and AS/NZS 4586:2004

16.3 Testing undertaken by an internationally accredited laboratory (A2LA and ILAC) to assess durability:

- Tensile strength/ retention
- Elongation
- Tear resistance
- Taber abrasion
- Flexural modulus
- H2o Absorption
- QUV weathering
- Impact resistance
- Solvent resistance

The above test methods, results and respective labs have been assessed by BEAL and found to be satisfactory.

#### Other Investigations

17.1 An opinion has been given by BEAL of the durability of The Vortex® Sprayliner System based on test data and in-service history.

17.2 The installation of the membrane system was also evaluated (site visits) in practical building situations assessing the following;

- Ease of installation
- Potential risks of non performance when being installed
- Any external factors that could affect the quality of the installed product
- Ease of repair or maintenance

17.3 The Technical Literature has been examined by BEAL and found to be satisfactory.



## Quality

- 18.1 The manufacture of The Vortex® Sprayliner System has not been assessed by BEAL, but details regarding the quality and composition of the materials used were obtained by BEAL and found to be satisfactory.
- 18.2 The quality of materials, components and accessories supplied by Integrated Protective Coatings Ltd is managed through the use of a **Building Product Quality Plan**.
- 18.3 The Integrated Protective Coatings Ltd Building Product Quality Plan ensures continuous conformance with the quality requirements from purchase to supply of components.
- 18.4 Integrated Protective Coatings Ltd Building Product Quality Plan is reviewed at least annually by BEAL.
- 18.5 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of the substrate systems in accordance with the instructions of the substrate manufacturer, Integrated Protective Coatings Ltd and this Appraisal Certificate.
- 18.6 Building owners are responsible for the maintenance of the Granitex Glaze Topcoat System in accordance with the instructions of Integrated Protective Coatings Ltd and this Appraisal Certificate.

## Sources of Information

- AS 2908.2:2000 Cellulose-cement products—flat sheet
- AS/NZS 3661.1:1993 Slip resistance of pedestrian surfaces, Part 1 requirements
- AS/NZS 4586:2004 Slip resistance classification of new pedestrian surface materials
- NZS 3101: 1995 The design of concrete structures
- NZS 3604:1999 Timber framed Buildings
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third edition May 2008, incorporating amendments 1 to 4.
- New Zealand Building Code Handbook and Approved Documents, Building industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.

## Concluding statement

- 19.1 In the opinion of BEAL, The Vortex® Sprayliner System is fit for purpose and will comply with the NZBC to the extent specified provided that it is used, designed, installed and maintained as set out in this Appraisal Certificate.
- The Appraisal Certificate is issued only to Integrated Protective Coatings Ltd, and is valid until further notification, subject to the conditions of this Appraisal

## Conditions of Appraisal

1. This appraisal Certificate :
  - A) Relates only to The Vortex® Sprayliner System as described herein;
  - B) Must be read, considered and used in full together with the Technical Literature
  - C) Does not address any legislation, regulations, codes or standards, not specifically named herein;
  - D) Is copyright of BEAL
2. The Appraisal Certificate holder continues to meet the quality requirements of the Integrated Protective Coatings Ltd Building Product Quality Plan and has the Certificate revalidated by BEAL on an annual basis.
3. Integrated Protective Coatings Ltd, shall notify BEAL and obtain approval of any changes on product specification or quality assurance prior to product being marketed including any trade literature, web site info or the like.
4. BEAL makes no representation as to:
  - A) The nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
  - B) The presence or absence of any patent or similar rights subsisting in the product or any other product;
  - C) Any guarantee or warranty offered by the Appraisal Certificate holder.
5. BEAL's verification of the building product or system complying with one or more above-mentioned criteria is given on the basis that the criteria used were those that were appropriate to demonstrate compliance with the NZBC at the date of this Appraisal Certificate. In the event that the criteria is withdrawn or amended at a later date, this Appraisal may no longer remain valid.
6. Any reference in this Appraisal Certificate to any other publication shall be read as a reference to the version of publication specified in this Appraisal Certificate.

Authorised Signatory



C R Prouse—Director  
[JULY 2011]

