



# 600 System

## Application Guide (Concrete)

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This application guide is for the Sprayglass International 600 System GRP Laminate Lining. The 600 system is based on a range of thermos setting vinyl ester and polyester resins which form a resilient, seamless chemical resistant membrane reinforced with glass fibre mat. The system is applied over a prepared concrete substrate by a combination of trowel, brush and roller. This hand applied system follows the contours of the substrate without the need for leak inducing cutting, fixing or jointing.

Other features include:

- Outstanding chemical resistance which can be tailored to suit operating conditions by simply changing the base resin.
- Excellent mechanical properties offering resistance against impact and abrasion damage.
- Excellent bond to the underlying substrate.
- Forms a seamless protective layer which will prevent any chemical permeating through to attack the concrete
- Provides long service life with little or no maintenance costs.
- Capable of bridging live cracks.
- Fast curing with full chemical resistance attained within seven days of application.

### 1. 600 System Specification

The substrate, to be protected should be prepared as per Sprayglass Concrete Surface Preparation Information Sheet (Doc. Ref. SG21). Apply a single coat of Sprayglass LP Primer to the prepared surface.

Trowel apply a silica filled Sprayglass 600 system base coat to a nominal dft of 1.5 mm, immediately followed by a laminate consisting of the selected vinyl ester or polyester resin and two layers of 450 gsm chopped strand mat. Whilst still wet apply one layer of surface tissue over the laminate and allow the system to cure.

When dry rub down any rough areas and remove spicules using heavy grit sandpaper and apply a coat of Sprayglass waxed resin top coat. The finished coating thickness will be approximately 3 – 3.5 mm.

### 2. System Application Process

#### 2.1. Preparation

- **Preliminary Inspection:** All the surfaces to be lined will be inspected to identify defects and define any remedial action required.
- **Cleaning:** If necessary, the concrete will be cleaned with high-pressure water jet, or with steam containing detergents in case of contamination by oil or grease.
- **Leveling:** Surface defects will be ground in order to obtain a plane surface suitable for lining application.
- **Grinding of termination chase:** Where the lining is to stop part way onto a wall or floor, a 10 mm deep by 5 mm wide chase to be cut into the surface into which the lining will terminate.



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- **Grit blasting:** All-surface to be coated will be grit-blasted using expendable abrasive to obtain a rough surface. The operator will make sure that surface laitance, mould etc is removed, as well as all traces of contamination.
- **Final Cleaning:** All dust, debris and blast residues will be removed by air blowing, vacuum or sweeping to obtain a dust free clean surface.
- **Control before primer application:** The supervisor will check that all surfaces to be lined conform to specification. Humidity level in the concrete will be measured with an electronic tester.

### 2.2. Priming

- **Objective:** A layer of catalysed Sprayglass LP Primer is applied on the concrete @ 25-50 microns. This primer infiltrates the micro cracks where it hardens, allowing a mechanical bonding of the 600 laminate to the concrete.
- **Pre-Application Checks:** The temperature of the primer to be allowed to reach a temperature close to the temperature of the workplace. Do not use too hot or cold primer. Check that relative humidity is lower than 85%, and that the temperature on the substrate exceeds the dew point by at least 3°C.
- **Application:** Apply with roller, and if necessary with a brush in corners or angles, a sufficient amount of primer. Depending upon the concrete porosity this quantity may vary between 0.3 and 1kg/m<sup>2</sup>.
- **Control after curing:** Control visually after primer curing. If the surface looks dry after application of the primer this generally means that there is not enough primer to fill the porosity and it is necessary to apply a second coat. The next working step may take place in a delay varying between 1 and 48 hours, depending on climatic conditions and work organisation.

### 2.3. Application of Laminate

- **Objective:** To provide a chemical resistant lining capable of withstanding impact and abrasion damage which is fully bonded to the substrate. The applied laminate forms a monolithic structure with no seams or edges.
- **Application of Base Coat:** Thoroughly mix the un-catalysed Sprayglass 600 resin using a mechanical whip. Catalyse according to quantity and ambient conditions using a medium reactivity peroxide based catalyst. As a general rule 1% to 2% catalyst for ambient temperatures between 10°C & 20°C. Mix the two components using a mechanical whip. Add the Sprayglass RB Filler powder to the catalysed resin in a 2:1 filler/resin ratio. Fully blend in the filler powder with a mechanical whip. The filler/resin ratio may vary slightly with temperature. Never mix more material than can be applied within the stated pot life. Under no circumstances should the resin and filler be mixed together before the resin is catalysed. The filler should be trowel applied to the substrate using a plasterer's or notched trowel in strips approx. 1.2 metres wide at a nominal thickness of 1.5 mm.



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- **Application of the glass mat:** Cut strips of 450 gsm chopped strand mat (CSM) and Surface Tissue. Strips should be approximately 50 mm smaller all round than the applied resin/filler base coat. Thoroughly mix the un-catalysed SG 600 resin using a mechanical whip. Catalyse according to quantity and ambient conditions. Whilst the base coat is still wet apply the first strip of 450 gsm CSM and completely impregnate with resin removing any air bubbles with the roller. Following the same procedure apply the second strip of 450 gsm mat wet on wet and roll out with a metal ribbed (paddle) roller to ensure a good bond between the base coat and the laminate.
- **Application of the surface veil:** Whilst the system is still wet follow a similar procedure as for the glass mats to apply a single layer of surface tissue. The finished laminate to be paddle rolled to remove any entrapped air from the system.
- **General Process:** The base coat (RB Filler), the glass mats and the surface tissues should be applied wet on wet. The glass mat and the surface tissue will be overlapped by at least 50 mm. If a layer has cured before the application of the next layer, some sanding work may be necessary. At the end of the day's work, the lining edge will be stepped layer by layer with each step being about 50 mm wide. The next working shift will start the work by sanding the stepped zone, and then applying the full system to the stepped area to form a seamless transition.

### 2.4 Application of the Top Coat

- **Control prior to application:** Visually inspect the laminate quality checking for air bubbles, dry spots or rough areas. Rub down rough areas or spicules using heavy grit sandpaper. Check the cure using a Barcol Impressor. The values should conform to the manufactures specification.
- **Defect Repairs:** Draw a circle exceeding defect size by a least 50 mm. Grind down to the substrate feathering the edges. Reconstitute the full lining structure.
- **Application:** The Sprayglass waxed topcoat should not be applied until the laminate has cured sufficiently (approximately 6 hours) and within three days of the completion of the laminate system. Add the appropriate amount of catalyst (1 - 2 % dependent upon climatic conditions) to the Waxed Top Coat and mix thoroughly. Apply by brush or roller to a nominal dft of 250 microns controlled by the frequent use of a wet film gauge.
- **Final Control:** Twenty four hours after the application of the Sprayglass waxed top coat carry out an acetone test to confirm the cure.

## 3. Quality Control

The Q.C. procedures must define which tests will be made, when and how. They also define the testing equipment, the procedures and the acceptance criteria. Their purpose is to check that the various operations of surface preparation and lining application are achieved in agreement with the specifications and the procedures.

The Control must Concern the following:

- Reception / Control of raw materials.
- Concrete preliminary inspection.



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- Control for contaminated material removal.
- Control of compressed air cleanliness.
- Control of grit / sand blasting, roughness, cleanliness.
- Operator's qualification.
- Control of temperature and climatic conditions
- Quantities of raw materials used.
- Time and temperature for curing.
- Primer visual Control.
- Reconditioning visual control.
- Laminate visual control.
- Laminate Barcol Hardness.
- Laminate adhesion test.
- Final Acetone Test

### Procedures and documents for Q.C.

The documents for quality control and the procedures should be submitted to the customer for their approval. These will include Surface Preparation and Coating Application control sheets, Climate control sheet and the manufacturer's Data Sheets.

## 4. Health & Safety

- A. MSDS information shall be supplied with all products and regardless of where application takes place shall comply with the current regulatory information.
- B. All ancillary products (cleaners / de-greaser) required for the lining process shall also be accompanied with the relevant information as above.
- C. Any supplied materials will be packaged in accordance to the current transportation regulations for their final destination.
- D. It will be the responsibility of the application contractor of the lining materials to ensure that all documentation regarding the correct and safe use of any materials supplied for the lining application is permanently available for scrutiny, and that if in event of an emergency an accessible copy is held at the application point.
- E. It will also be the responsibility of the application contractor of the lining system to ensure that all personnel meet the specified requirements for Personal protective equipment (PPE) also all regulatory requirements pertaining to Occupational Exposure limits shall be met by the contractor.
- F. All Health & safety requirements specific to the working environment in which the application takes place covering, surface preparation, application and inspection shall be adhered to.



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- G. Permit to work regulations shall be observed and complied with.
- H. Confined space entry regulations shall be strictly observed.
- I. It will be the responsibility of the application contractor to ensure that all personnel who have need to operate or come into contact with airless spray system used for the application of the lining materials (topcoat) have received sufficient training in the operating and safety procedures concerning the specific make of equipment being used.

### 5. Storage Information

Storage temperatures for Sprayglass epoxy vinyl ester resins should be maintained below 20°C for maximum shelf life. The resin should be kept away from all sources of heat, which might create localized hot spots.

Vinyl ester resins are stable at ambient conditions, but if handled improperly, may polymerize slowly. In fact, exposure to sunlight or other sources of high temperature can lead to rapid polymerization with dangerous exotherm. 200 kilo unit drums should be stored in a cool dry place out of direct sunlight.

**Resin Shelf Life:** Sprayglass 600 system epoxy vinyl ester resins provide superior performance in reinforced plastic applications. This is due, in part, to their high degree of reactivity. A side effect of high reactivity however is somewhat limited shelf life. The shelf life warranty for each resin is stated on the drum. 600 resins should be used within the stated shelf life. Sprayglass cannot honour any claims for credit on resins that have been stored beyond the maximum storage time. Sprayglass 600 epoxy vinyl ester resins shelf life is based on the date of resin manufacture.

**Inventory Rotation:** To minimize potential shelf life problems, you should maintain your inventory of resins on a first-in first-out basis, i.e., always use your oldest resin first.

**Organic Peroxide Storage:** Organic peroxide (Catalyst) should be segregated from the resin. Containers should be stored in a well-ventilated, flame proof area at a maximum temperature of 20°C. Bulk storage should ideally be in a secure brick building, but smaller quantities can be stored in suitable metal cabinets. Containers should be opened only immediately prior to use and should never be left open. Use by the date shown on the container. All Storage areas should be kept clean and free from combustible materials such as rags and paper-towels. Good standards of hygiene should be observed and smoking should be prohibited. Any accidental spillage must be dealt with immediately.

**Storage of Glass Fibre:** Glass Fibre products (450 C.S.M & surface veil) should be stored carefully so they remain clean and dry and must not absorb water. Glass mat that is dirty or has absorbed water should not be used, because the presence of dirt or moisture could inhibit resin / fibreglass compatibility, resulting in poor laminate quality.