DATAsheet

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SEALERS for Concrete Flatwork

1 INTRODUCTION

Concrete surfaces in various shapes and textures are becoming a popular architectural expression for flatwork. The main function of a sealer is to prevent staining of the surface and to facilitate its cleaning. Some sealers can give concrete a 'wet' appearance which, consequently, highlights the colour of the concrete. Some sealers may be tinted and thus provide both a seal and a coloured finish.

Generally, sealers should not be applied until after the concrete has cured.

2 CHOICE OF SEALERS

In selecting a sealer, a clear understanding of its role in the particular application is vital. Sealers range from wax-based products, to chemical products available commercially. The suitability of a given product for a particular surface finish (and for the intended use of the surface) should be checked with the supplier.

Some sealers may not readily penetrate a honed or steel trowelled surface, or may need to be thinned in accordance with the manufacturer's recommendations. Flatwork subjected to traffic (either vehicular or pedestrian) will need to be resealed from time to time; the period depending on the extent of traffic and the sealer used. In this case, the sealer used should be suitable for multiple re-applications. Penetrating sealers that are protected by the corporate surface may offer increased durability in heavy traffic areas.

Sealers intended for patterned paved driveways are not suitable for polished concrete floors. The steel trowelled finish required for polished concrete does not allow these sealers to readily penetrate the concrete, usually resulting in the sealer remaining as a thick coating on the surface. It may also cause problems with the evaporation of the solvent, resulting in the sealer not hardening properly.

The application of film-forming sealers may also affect surface noise from vehicles, ie increase the incidence of tyre 'squeal' in carparks. The use of penetrating sealers or rougher surface textures will generally assist in this regard.

In summary, the following should be considered when selecting a sealer:

- The type of surface finish
- Whether the surface is external or internal (ie protected from the elements)
- The intended use of the surface (eg domestic, commercial, industrial, carpark)
- Ease of re-application (if required)
- Bonding of subsequent surface treatment (if required)
- Issues relating to the application of the sealer (eg ventilation).

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3 PRODUCT TYPES AND APPLICATIONS

3.1 General

Sealers fall into two distinct categories, viz penetrating sealers and those that form a film on the surface. Most sealers are solvent-based for durability; however, water-based sealers are available. For information on the composition and use of particular products, the manufacturer's literature should be consulted.

3.2 Wax-based Sealers

Wax-based products including natural beeswax and petroleum-based wax are film-forming sealers and can be used for internal surfaces. They are low in cost but need to be re-applied regularly. A build up with successive layers should be avoided as dirt can embed itself into thicker wax layers and make cleaning difficult.

3.3 Oil-based Sealers

Natural oils such as pure tung oil may also be used as a penetrating-type sealer. They are applied in a number of coats until no further oil is able to penetrate the concrete surface. As a natural product it is suitable for food preparation areas such as concrete benchtops. Pure tung oil will provide a matt finish and should not affect the colour of the concrete. For semi-gloss or gloss finishes a suitable surface coating will need to be applied. Tung oil is UV resistant and may be used for both interior and exterior applications. For high traffic areas, re-application once a year may be required.

3.4 Acrylic Sealers

These are commonly available in either water-based or solvent-based form. They provide relatively good protection against staining and are widely favoured because of their low cost. They are easy to apply and, if necessary, can be successfully repaired and easily re-applied over the existing sealer. Such products can be tinted readily to enhance the concrete colour or colour of exposed aggregates finishes. They may be used internally and externally as they are UV resistant. A typical external situation may require a reseal every 12–24 months. Typical uses are in wet areas, pool paving, driveways, exposed aggregate and patterned paving.

3.5 Urethane Sealers

Urethane sealers provide higher abrasion resistance than acrylic sealers. Both water- and solvent-based types are available and they generally fall into the surface-film category. They are ideal for heavily trafficked surfaces, including commercial and food court premises. Urethanes also possess good resistance to a range of chemicals and other substances and are regularly specified for industrial applications. They are generally suitable only for internal use. For external use, a special non-yellowing, UV resistant formulation should be used. Prior to resealing, the surface will need to be sanded to ensure a mechanical bond between the new and existing sealer.

3.6 Silicone Sealers

These are solvent-based and being a penetrating type sealer, give a matt finish to the surface without affecting its surface texture or colour. They are suitable for both external and internal surfaces. As silicone-based sealers affect bonding with subsequent surface treatments, they should generally be used only where no further treatment of the surface is required.

3.7 Epoxy Sealers

These are most commonly used for internal applications (due to lack of UV resistance) and are generally the most abrasion resistant, durable and hard-wearing sealers available. They offer enhanced protection against staining. Typically, epoxy sealers provide a high gloss to surfaces and can be tinted readily. They may take longer to harden than acrylic sealers due to the chemical reactions involved, in some cases exceeding 18 hours dependent on ambient conditions. Epoxy sealers are difficult to reapply and require some surface preparation to facilitate mechanical bond of the subsequent layer. Typical uses are in commercial and industrial buildings, food outlets and hospitals. They are generally not used on textured surfaces since surface preparation for subsequent coats is difficult.

4 SLIP RESISTANCE

To improve slip resistance on ramps and where the surface may be contaminated with water and other materials, silica chip or carborundum dust may be sprinkled over the final application of sealer. Penetrating sealers rather than those forming a film on the surface provide better slip resistance as they allow the texture of the surface to contribute to its frictional properties. Regardless of the type of sealer used, the surface should be regularly maintained to prevent a build up of oil, grease or grime which will affect the slip resistance. Refer to Data Sheet *Slip Resistance of Polished Concrete Surfaces*.

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