

TECHNICAL BULLETIN

NOTES ON THE USE OF STONE AND MASONRY SEALERS

INTRODUCTION

The use of stone and concrete sealers has become more common as consumers are being drawn to the appearance of raw concrete and porous stone, but want to protect the surface from weathering, dirt accumulation and moisture staining. The application of sealers is relatively straightforward, however there are some points which can catch applicators and lead to unexpected results. In this bulletin we will look at some of the issues.

WHAT ARE THE SEALERS?

Sealers are normally a clear polymer or silane-silicone-siliconate-reactive silicate type compound which can be water or solvent borne.

They can either be *film forming* which means they create a layer on the surface or *penetrative* and soak into the stone/tile/concrete matrix to fill pores and voids. DUNLOP NATURAL LOOK SEALER and DUNLOP GROUT SEALER are penetrative type sealers which absorb into the matrix of the material being sealed.

Film forming sealers create a visible surface coating which may result in a plastic appearance on the material being sealed, but will also be more likely to resist water. *Penetrative sealers* usually only change the shade of the tile slightly, normally to slightly darker and typically are not shiny in appearance though maybe slightly satin depending on the properties of the product used.

The purpose of applied sealers is to protect the surface and enhance its appearance, but also provide a degree of resistance to water penetration. They

are not intended to act as true waterproofing or moisture barriers. This last point is very important, and user need to recognise that sealers are not defined as waterproof membranes under the Australian Standard for waterproof membrane performance AS4858-2004 or the Construction Code of Australia (formerly known as the Building Code of Australia). They cannot be used for waterproofing of structures such as bathrooms or verandah and decks.

SEALERS AND BONDED TILES

A relatively commonly requested practice is sealing of stone tiles on six (6) sides prior to the application of the tile adhesive. This is not a practice DUNLOP recommends because the sealers can interfere with the tile adhesive bond. Only sealers that have been tested to work with DUNLOP adhesives can be used with six side sealed tiles. No sealers have been approved for use with DUNLOP adhesives at the time of writing.

ISSUES THAT CAN OCCUR WHEN APPLYING STONE AND MASONRY SEALERS

VARIABLE GLOSS AND DULL APPEARANCE.

Usually this means that there is a difference in the properties of the material being sealed. For example, if part of the surface is more porous and absorbent, the sealer will be sucked in to the matrix, leading to a duller appearance than less porous areas where the sealer can sit on the surface. There is no simple solution to this problem; re-application may well fix the appearance of the duller areas, but at the same time create a thick layer over the less porous areas. Test areas may need to be done to see what the results are.

Sealers are also supplied in different end appearances ranging from matt and satin to glossy and 'water wet'. The end user has to decide before application what the preferred final finish will be, and potentially do test areas.

THICK LAYER FORMED ON THE SURFACE

There are several ways that this can occur;

- A *penetrative sealer* applied to a non-porous surface will create a surface film as it dries,
- Application of too many layers of a sealer, even a non-film forming one, can result in a thick layer of material on the surface. This is far more likely with polymeric sealers, than treatments like the various silicone/siliconate type materials
- Re-application over a previously sealed surface.

This film may well peel off over time, produce an unwanted shiny/satin/dull surface appearance or age and become unsightly.

WHITE PATCHES

The appearance of white patches with sealers signifies a moisture problem has developed. This can be from several sources;

- The sealer (water borne) has been re-coated before the previous coat has dried properly, which then traps moisture in the previous layer, and develops white clouding.
- A sealer (water borne) has been applied too thickly and surface skinned, then not dried within itself trapping moisture

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- c. The sealed surface was damp and this has interfered with the sealer drying
- d. The sealed surface has a rising damp problem and the sealer is not intended to withstand constant dampness, and so hydrolyses or simply attaches water molecules to the sealer and creates hazing.

SEALER PEELS OFF THE SURFACE

This really applies to *film forming* sealers. Peeling and de-bonding are simply a function of applying the sealer to an incompatible or contaminated surface. They should be applied in accordance with the suppliers recommendations for the correct surfaces to be sealed, and also following any surface preparation requirements.

SEALER BEADS OR DEVELOPS WINDOWS ON THE SURFACE

The sealer has been applied to a surface not compatible with it, or it has been applied to a contaminated surface, such as oils or greasy materials.

SEALER YELLOWING

Sealers exposed to U.V. in external environments can develop yellowing over time as the polymer in the sealer is attacked and decomposed. The old material has to be removed (if possible) and the surface re-treated.

EFFLORESCENCE OR BLOOMING

This is an effect specific to reactive silicate/silica sol sealer and hardener densifiers. This type of product is only applicable to concrete which contains Portland Cement, and has free lime available. What happens is the silicate reacts with the free lime to create a

new mineral phase which fills the concrete pores. In the process, any contaminants in the pores are forced out and can appear on the surface as blooming. The silicates can also react with Carbon Dioxide in the air to produce crusty surface efflorescence. These deposits can be removed by mechanical preparation of the surface, or in more extreme cases the surface may need to be treated with dilute acid.

DISCOLOURATION OF TILES OR GROUT

We have noted that solvent based sealers can create discolouration where the solvent interacts with the surface being sealed, or in the case of grouts, the solvent penetrates the grout and affects the tile adhesive. The latter is more common, and specifically effects rubber modified adhesives creating brown staining on the grout as soluble components are leached from the black rubber crumb.

STAINING

There is a belief that sealers totally resist staining, but this is a misconception about how sealers work. Sealers are intended to reduce the risk of staining and permit a quick clean to be effective. However, some types of staining materials can penetrate or react with the sealant if left in place for extended periods. Examples include oils, red wine, vinegar and dyes, some types of animal droppings and gum leaf residues. The best solution is to remove staining materials and not leave them.

Sealers are also not strictly speaking intended to prevent the growth of algae, mould and lichens but will slow them down.

REMOVAL OF SEALERS

When a sealer is a *penetrative* type, it is effectively not removable from within the matrix of the material sealed. Sealed porous ceramic tiles cannot be corrected if there is a problem or a different appearance is wanted. Where the sealer has only penetrated a few millimetres into the surface, mechanical surface preparation can remove it (concrete, and stone), but doing this with ceramic tiles will irreversibly damage the surface.

Surface *film forming* sealers may be removed by mechanical methods, potentially paint strippers or specialised removers, but in the latter cases a test area should be done in a place that is unobtrusive so that the impact of any visible damage can be minimised and localised.

NOTES

Always refer to the product data sheets for specific usage details.

The information contained herein is to the best of our knowledge true and accurate.

No warranty is implied or given as to its completeness or accuracy in describing the performance or suitability of the product application.

Users are asked to check that the literature in their possession is the latest issue.

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