

CASE STUDY:- CS 4



STONE SEALERS

Marble & Stone Sealers

Stone installations undergo problems such as picture framing, mineral stains (for example from soluble pyrite, iron sulphide), and water marking and even primary and some secondary efflorescence are well known. Although not all natural stones are prone to these issues there is still a significant number that are. Sealing of a stone has been advocated by some people in the industry as a fix-all for these problems. There have been numerous studies and products for sealing stones, but there is always a apprehension among professionals and customers about different types of Sealers available in the market. Broadly, Sealers can be divided among 3 different categories.

1. Topical Sealers
2. Penetrating Sealers
3. Impregnators

All the products across various categories have their own unique advantages and shortcomings. So, choosing the right kind of Sealer requires a great deal of understanding of the substrate as well as chemical composition of Sealers.

In this article, our emphasis is on imparting a basic understanding about Sealers.

Types of sealers

1. Topical sealers

Topical Sealers are coatings designed to protect the surface of the stone against water, oil, and other contaminants. They are formulated from natural wax, acrylic, and other plastic compounds. They will significantly change the look and slip resistance of the surface, especially when it is wet.

Advantages

- Some topical sealers contain additives that produce non slip characteristics. This is great for natural stone flooring.
- They create a protective barrier between water and oil contaminants, foot traffic, and the stone.
- They protect the stone from surface scratching and etching caused by acidic materials such as orange juice and coke.
- For the shiny, glossy look, a topical natural stone sealer can produce a gloss that can be buffed. This allows for the maintenance of a high gloss surface.

Disadvantages

- They alter the appearance of the stone by adding a gloss sheen and may also deepen the color of your stone. This is not so great for a honed natural stone surface.
- Moisture is trapped within the stone. The protective barrier doesn't allow the stone to breathe.
- As they create a film on the surface of the stone, it tends to show scuffs, marks, and paths in heavy traffic areas. But, these marks are removed during the reapplication process.
- These sealers are not breathable i.e. do not allow the escape of water vapors and other gases, and are not effective against salt attack, such as efflorescence and spalling.
- These sealers may be effective at stopping stains but, being exposed on the surface of the material, they tend to wear out relatively quickly, especially on high-traffic areas of flooring.

2. Penetrating sealers

These sealers penetrate the surface of the stone enough to anchor the material to the surface. They are generally longer lasting than topical sealers and often do not substantially alter the look of the stone, but still can change the slip characteristics of the surface and do wear relatively quickly. Most of them use siliconates, fluoro-polymers and siloxanes, which repel liquids. They often require the use of special cleaners which both clean and top up the repellent ingredient left on the stone surface.

Advantages

- The sealer penetrates into the stone and attaches its protection to the stone walls within the pore structure. This allows the stone to breathe.
- It does not alter the color or sheen of the stone.
- It doesn't need to be reapplied after each cleaning.
- The sealer is not on the surface so the coating won't scratch or scuff.
- A penetrating sealer does not need to be reapplied as often as a topical sealer because there is no surface coating to wear off.

Disadvantages

- Penetrating sealers do not protect the surface of the stone from scratching or etching.
- They do not penetrate deeply enough (generally less than 1mm) to be effective against salt attack, such as efflorescence and spalling.

3. Impregnating sealers

Impregnators are water-based or solvent-based solutions that penetrate below the surface and become repellents.

They keep contaminants out, but do not stop the interior moisture from escaping. They are considered “breathable,” i.e. they have vapor transmission.

Some modified silane sealers impregnate deeply enough to protect against salt attack, such as efflorescence, spalling, picture framing and freeze-thaw spalling. Some silane stone sealers based on nanotechnology claim to be resistant to UV light and higher pH levels found in new masonry and pointing. A good depth of penetration is also essential for protection from weathering and traffic.

Advantages

- Most impregnators will not change the appearance of the stone.
- Most impregnators do not require frequent applications. Since the impregnator is below the surface, it will generally last several years before reapplication is necessary.
- Most impregnators are not affected by UV light since they are below the surface where UV light cannot penetrate. For this reason they can be used outdoors.
- They are generally hydrophobic (water-repelling), but are also oleo phobic (oil-repelling).

Disadvantages

- Impregnators that are solvent-based produce noxious and flammable vapors during application.
- Solvent-based impregnators are harmful to the environment producing high VOCs (volatile organic compounds). Always check the Safety Data Sheet (MSDS/SDS).
- Impregnators require a semi-skilled person for application. Proper training is highly recommended.
- The initial cost of most impregnators is relatively high.
- Impregnators in general cannot be used below grade to resist hydrostatic pressure. Since the stone is still capable of breathing, water can be forced through the stone by pressure. When choosing the proper product for protection, the above guidelines should help. Always talk with the manufacture or distributor, and let them know where you plan to use their product. They can be very helpful if you tell them all the conditions that apply.

Comparison Chart of Sealers :

Sealer Type	Use on	Primary Applications*	Type of finish	Performance
Penetrating Sealers	Exterior applications, and thick, smooth or polished stone types such as granite or marble	Exterior concrete surfaces subject to corrosion and freeze thaw damage. Where a natural, matte finish is desired	Provide invisible protection without changing the surface appearance or leaving a sheen	Provide excellent protection against outdoor exposure conditions. Most products are breathable, allowing moisture vapor to escape
Water based Impregnating Sealers	Best on stones with open pores, i.e. marble, limestone, slate, etc.	Indoor/outdoor use	Moderate to reasonable reflective values.	Easy to apply. Very absorbent due to nature of stone
Solvent based Impregnating Sealers	For stones with hard, highly polished, tight pores, i.e. granite, ceramic, porcelain, etc.	Recommended for outdoor use for its resistance to ultraviolet rays from sun. Used in interiors to repel organic and inorganic stains	High gloss, depth and enriched colour	Deep penetrating and long lasting. Initial solvent odor
Topical Sealers	Not for Exterior uses, forms layer so not suitable porous stones		Sheen is observed	Limited durability as they form film on the substrate

*Always check with the sealer manufacturer to verify the compatibility of its product with the decorative surface you plan to apply it to.