

PROTEC III OVERCOMES COMMON PROBLEMS

The Ability of the Liquid Hardener to Penetrate Is What Determines It's Effectiveness

Liquid hardeners and densifiers are now a big part of the marketplace due to the unavoidable problems that dry shake hardeners are having. The main reason is today's concrete mix designs have changed, causing incompatibility issues with the dry shake hardeners. Today, less companies still manufacture dry shake hardeners compared to even five years ago, and it is projected in the next five to ten years that dry shake hardener will virtually disappear from the market place. According to contractors the two main complaints are the surface delaminations of the dry shake hardener and the high expense to repair the problem. The second is having to use a known carcinogen and the health hazards and liability issues associated with their use. Liquid hardeners and densifiers are water based and safe to use. They were introduced to the market at least 30 years ago.

In 1999, Cornerstone Coatings started to manufacture and install sodium silicate hardener and densifiers. The obstacles they saw and experienced first hand with the installation of sodium silicates was the very reason they spent two years developing and designing what is now called Protec III: Original. As a sales company they wanted to avoid at all costs the problems they were experiencing with the sodium silicates such as:

1. Poor penetration
2. Required a lot of labor to use the product.
3. Required scrubbing and wetting with water to try to get the product to penetrate into the concrete surface.
4. You have to remove what did not penetrate the concrete and dispose of it properly.

This was troubling to us, because what were you really giving the customer when you have to throw away the product. Just how much of the product was actually going in, and was the customer really getting their money's worth.

5. Disposal of waste. This by-product of scrubbing and rinsing with water by industry standards is now considered hazardous waste, so dumping on the ground or washing down the drain is not allowed.

Protec III Overcomes The Common Problems of other Liquid Hardeners

Protec III is a water-based formulation that has a very small molecular size (approximately .001 microns) which makes it one of the smallest and easiest liquid hardeners for penetrating concrete surfaces. Protec III overcame the previous problems of sodium silicates by:

1. Having a very small molecular size, easy penetration
2. No scrubbing and wetting down with water
3. No hazardous waste to remove and dispose of.
4. Minimal labor costs

Plus the version of Protec III: W.H.A.M is the only liquid hardener that meets ASTM C309 as a cure and seal with the benefit of a liquid hardener and densifier.

When Cornerstone Coatings was doing research the one product that stood out in regard to penetration of the concrete surface was the lithium based products. The one draw back was the cost of the products. Lithiums are very expensive, usually triple the price. To keep costs down, some lithium based products are diluted down with sodium silicates which can lead to the penetration issues stated above. After thorough testing, the benefits of the very expensive lithiums did not show any noticeable advantages over the product Protec III.

The Science Behind The Product

The basic chemistry in Protec III and all silicates, be it sodium, potassium, lithium, colloidal is they all need to penetrate the concrete in order to work. These products all need calcium hydroxide

(free lime) which is present in concrete, approximately 25%. These are considered the weak bonds of the concrete structure, and are present in the concrete top wear layer. These weak bonds cause concrete to dust. For exterior concrete exposed to freeze thaw cycles these weak bonds leave the concrete surface susceptible to concrete popping and shaling. Liquid hardeners penetrate the concrete surface (if they can) and chemically react with the calcium hydroxide creating tri-calcium silicate crystals. The old weak bonds are now changed to strong bonds through this chemical reaction.

This makes your concrete floor harder and more dense. The result is a dust-free concrete surface with added benefits of being resistant to concrete popping and shaling.

Conclusion

The results show that liquid hardeners and densifiers work very well for hardening and protecting the concrete floor as long as they can penetrate the concrete. The effectiveness of the liquid hardener will always rely on its ability to penetrate and that is where Protec III excels.