SUPER-KRETE® International, Inc.
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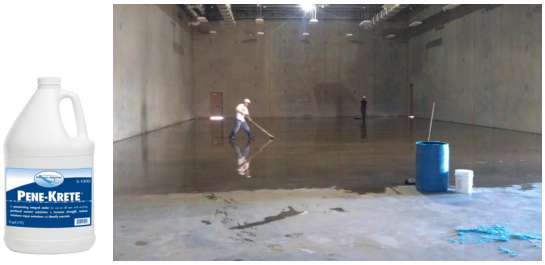
S-1300 Pene-Krete (Spray-Applied)



S-1400 Pene-Krete Additive

S-1300 Pene-Krete

- Spray Applied

S-1300 Pene-Krete is a topically-applied densifier that is sprayed on to the surface. It provides waterproofing of concrete substrates and chemical encapsulation within. Proper application procedures must be diligently followed to ensure success of the treatment.

General Information

Proper surface preparation of a concrete substrate is critical in the success of coating adhesion. It is also imperative that moisture vapor transmissions be reduced to tolerable levels, and that the excess chemicals with the cement-based matrix become encapsulated and any excess chemicals are purged to the surface and removed. The primary cause of surface coating failures is due to the excess chemicals forced to the surface by the moisture vapor transmissions that become trapped beneath the topical coating. This is evident when the failed areas are removed and efflorescence is present. The excess chemicals that are purged to the surface disintegrate the top layer of the cement supporting the topical applied products. Therefore, the concrete substrates must be treated with Pene-Krete so that the excess chemicals can be purged and removed before coating applications.

On-Grade Surfaces

All concrete or cement-based surfaces shall be bare concrete, clean, porous and free of any surface materials that will inhibit the product penetration. Test the surface for porosity by pouring small amounts of water onto the cement based substrate and ensure the water immediately penetrates.

Saturate the surface with clean water and allow the surface to thoroughly dry.

Immediately after the surface water has dried saturate the surface with S-1300 Pene-Krete by sprayer only and using a soft bristled broom, spread any standing product to a more porous area for penetration. Approximate coverage rate is 300 square feet per gallon of product.

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If areas of the surface dry too quickly this means that area is more porous than other areas and should be re-sprayed. Although Pene-Krete is a liquid material, it will not dry as quickly as a watered, wet-down surface.

As soon as the Pene-Krete surface material has dried, wet the surface down with water. Apply a total of three wettings of clean water to assist in driving the material full depth.

After the 24-hour curing period check the surface for efflorescence. If efflorescence is present on the surface remove it using a trisodium phosphate (TSP) wash or by sanding and repeat the treatment process until no efflorescence is visible upon the surface.

Vertical & Overhead Surfaces

Vertical and overhead surfaces are prepared in the same manner as on-grade surfaces. The only difference is the surface is sprayed with three light applications at thirty (30) minute intervals instead of a single application and the surface is still wet down with three applications of water.

Curing Agent

S-1300 Pene-Krete may also be used as a curing agent over new concrete. As soon as the concrete has cured sufficiently to walk on by foot, saturate the newly poured concrete by sprayer only at 300 square feet per gallon. This curing system eliminates the typical procedure of a wet cure or covering the concrete with sheet materials.

Note: The process of wetting the surface down prior to the application of the Pene-Krete assists in the absorption of material into the concrete pores. The three wettings applied after the Pene-Krete application drive the product full depth. Observation of application in the field have shown that S-1300 Pene-Krete will penetrate a substrate between 8” and 14” in depth. Caution: If the S-1300 Pene-Krete does not penetrate the surface it will become a bond-breaker and any type of surface applied coating fail in those areas. If the product does not penetrate remove it immediately by rinsing off the surface with clean water.

Do not apply Pene-Krete products to any surfaces other than cement-based.

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S-1400 Pene-Krete Additive

- Additive for cement-based materials

S-1400 Pene-Krete Additive (hereinafter referred to as S-1400) is a treatment for concrete that was developed to protect Super-Krete cementitious coatings, stains and sealers from delaminating from concrete substrates due to the entrapment of moisture vapor transmissions, alkali and free lime. Fourteen ounces of S-1400 are added to the concrete truck per each cubic yard of concrete. Installers who have incorporated S-1400 into their new concrete pours have experienced no coating failures and a much more solid color when incorporating integral coloring products. Acid stains, dyes, water-based stains and all coloring products applied over their treated concrete yield more distinctive boldness.

As concrete cures, the water, alkali and free lime are forced to the surface of the concrete and the residue is often referred to as efflorescence. It is the efflorescence that creates the discoloring of the coloring systems. S-1400 encapsulates and thickens the bleed water forced to the surface creating the problem. Field results have proven that that even in high temperatures (greater than 100 degrees farenheit with windy conditions) the concrete experiences no shrinkage cracks and provides a more uniform finish due the fine particles being purged to the surface in place of the excess water. In freeze/ thaw climates around the world S-1400 has had exceptional results in stopping freeze-thaw damage.

It is important to understand exactly how S-1400 works. Immediately after S-1400 is added to the concrete, the concrete starts to decrease in temperature, mixes with the alkali and free lime from the cement paste creating a dense matrix and immediately encapsulating the chemicals. Water poured onto the still wet concrete will be repelled and a self- compacted matrix forms. No curing compounds, wettings or coverings of the concrete are required. As experienced by installers around the globe, the new concrete becomes chemically cured within 8 days versus the standard 28-days, allowing the application of coating materials over the new concrete. The 28-day curing period is required to allow the excess water and chemicals to escape from the concrete. S-1400 encapsulates and expels the excess chemicals within an 8-day period, allowing the installer to proceed with applying their products much sooner.

There are, however, several “DON’T’s” to consider when incorporating S-1400 into cement mixes.

Never add an air-entraining agent to the concrete. Air-entraining agents are designed to create larger pores within the concrete which allows for the expansion of frozen water within the capillaries. S-1400 at the same time is reducing the size and quantity of the capillaries to prevent the water from entering the concrete pores in the first place.

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Avoid applying water to the surface during the finishing process as this may accelerate bleed water to the surface. It is better to add additional water to the concrete to assist in finishing. The addition of water to the concrete up to a 7 slump will not alter the strength or integrity of the concrete.

S-1400 typically increases the strength of the concrete by 23-27% depending upon the amount and quality of the cement. However when fly ash is added to the concrete (which also increases the strength) the increase in strength of may not be noticed.

Never add more S-1400 to the concrete than that recommended by Super-Krete International, Inc. Adding more S-1400 than recommended will slow down the acceleration of concrete curing and finishing of the surface will be delayed.

Advantages

- Curing time of the concrete to place topical coatings reduced from 28 days to 8 days.
- Provides a water resistant substrate with a porous surface to accept coating products.
- Reduces moisture vapor transmissions and provides chemical encapsulation of efflorescence.
- Provides more color depth to integral color and topically applied coloring systems.
- Stops coating failures due to the entrapment of efflorescence beneath the coating system.
- Allows as more flowable workable mixture during concrete installations.
- Requires no curing compounds or keeping the surface moist during the curing period.
- Protects the concrete from absorbing moisture from all directions.
- Used as a secondary vapor and water barrier against failed topical applied waterproofing.
- Provides self-consolidating concrete.
- Prohibits carbonation attack and the corrosion of the reinforcing steel.
- Stops shrinkage cracking.
- Protects concrete from freeze/thaw damage.

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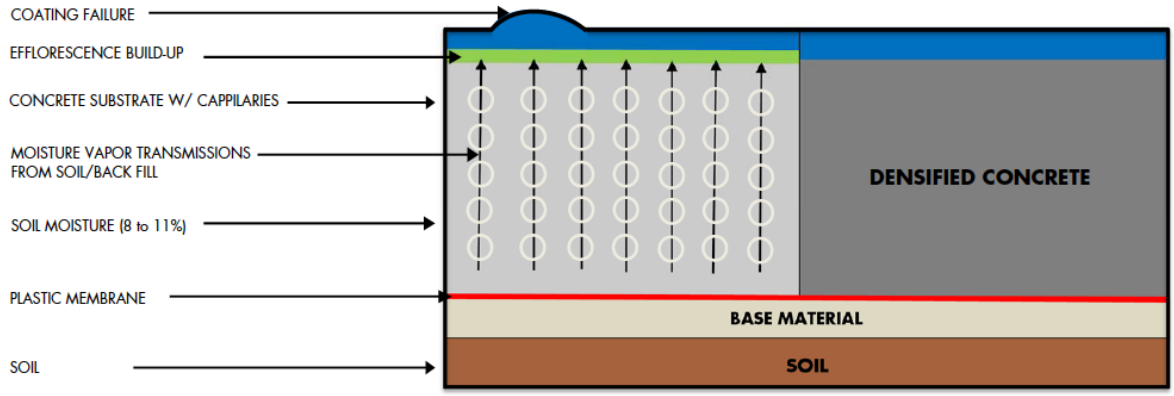
HOW SUPER-KRETE® PENE-KRETE ® PRODUCTS STOP COATING FAILURE



THE PRIMARY CAUSE OF COATING FAILURES IS DUE TO THE ENTRAPMENT OF CHEMICALS FROM THE CEMENT BEING FORCED TO THE SURFACE BY MOISTURE VAPOR TRANSMISSIONS IN THE FORM OF EFFLORESCENCE. THE EFFLORESCENCE ACTUALLY DISINTEGRATES THE TOP LAYER OF THE CONCRETE SUPPORTING THE COATING SYSTEM. ANY TYPE OF TOPICAL NON-BREATHING COATING WILL EVENTUALLY CAUSE COATING FAILURE. THIS IS EVIDENT WHEN THE FAILED AREA IS REMOVED AND THERE IS AN UNDERLYING FILM OF EFFLORESCENCE. IT IS IMPERATIVE THAT THE CAPILLARIES WITHIN THE CONCRETE BE REDUCED IN SIZE AND ALL EXCESS CHEMICALS BECOME ENCAPSULATED. THIS PROCEDURE IS ACCOMPLISHED BY USING "FULL DEPTH" DENSIFICATION FOR EXISTING CONCRETE OR DENSIFICATION ADDITIVES IN NEW CONCRETE INSTALLATIONS. THE DENSIFICATION OF THE CONCRETE ALSO PROVIDES REDUCED SHRINKAGE CRACKING IN NEW CONCRETE, REDUCED WATER PENETRATION, FREEZE-THAW RESISTANCE, AND REDUCTION IN MOISTURE VAPOR TRANSMISSIONS TO TOLERABLE LEVELS, INCREASED STRENGTH AND IN NEW POURS ADDITIONAL WATER IS ALLOWED IN THE MATRIX EASIER INSTALLATION WITHOUT BEING DETRIMENTAL TO THE STRENGTH OF THE CONCRETE. OVER TWENTY YEARS OF PROVEN SUCCESS THROUGHOUT THE WORLD HAVE PROVEN THAT WHEN SUPER-KRETE PENE-KRETE PRODUCTS ARE USED TO TREAT CONCRETE, COATINGS DO NOT FAIL.

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Developer's Notes on Pene-Krete Products Being Used as a "Densifier"

With over 43 years of applying virtually every coating system over concrete substrates, I have learned that you cannot seal off the concrete with a non-breathable surface coating. Regardless of how well prepared the concrete is to receive the coating system it will eventually fail. It may be overnight or ten years later depending upon the rate of the moisture vapor transmissions or the amount of chemicals from the cement carried to the surface by the moisture vapor transmissions. Yes, vapor barriers beneath the concrete assist in preventing the problem, but concrete can still absorb moisture from the air and travel through the edge of the concrete or foundation walls. Concrete is like a magnet for moisture from the ground, air and weather/temperature conditions.

The introduction of concrete densifiers into the industry over the last few years is nothing new. Densifying of the concrete has been used since the (1920's) throughout the United States, Asia and European countries for decades. Today there are many densifiers or crystallization products as they are often referred to. Many variations of densifiers are used in the polishing of concrete. Some are topically applied topically as either a curing compound or over a porous substrate for full depth densification to assist in waterproofing capabilities, moisture vapor reduction, chloride-ion resistance, crack and curling prevention. Some densifiers are added to the concrete in a cement-based or liquid form.

There is much controversy over the effectiveness of densifiers since the industry does not know how to properly test the products to show the improvements to concrete. The only proper way to test densifiers is not in the laboratory environment but in actual field performance testing on new and existing concrete. Those that use densifiers for full depth penetration, moisture vapor transmission reduction, chemical encapsulation, crack and curling resistance can affirm that densifiers do indeed work and work well.

There are at least three reasons why topical applications are shunned by contractors applying coating systems. One is the extra day required for the densifier application process, another is that the surface has to be profiled, and that they are not correctly applying the densifier, which, when it does not penetrate it will create a bond-breaker and cause failure of the applied coating. There are many projects that have failed numerous times and where have saved the day. There are many references that support the success of densifiers either topically applied or added to new concrete that will improve the performance of concrete. What is not well understood is the fact that MVT simply forces the excess chemicals to the surface normally referred to as efflorescence. This efflorescence builds up beneath the coating system and actually disintegrates the top layer of the concrete supporting the coating system. It should be noted that there are numerous densifiers on the market that provide the crystallization process and claim that if a crack occurs the crystallization will re-emulsify and fill that crack. There are also densifiers that first crystallize and in a period of 28 days turn the capillary into a non-reemulsifiable concrete. It is extremely important that the crystallization does not re-emulsify if topical coatings are applied otherwise the chemicals will again be forced to the surface w-here the deterioration process will again take place. Hopefully the use of densifiers will become a standard application procedure and be specified into projects by designers, architects and engineers in the near future to provide better and longer lasting concrete and cementitious installations.