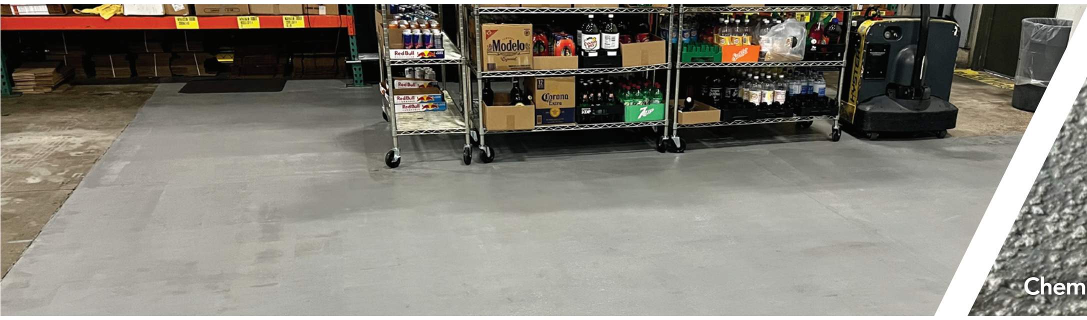
ZIRCONIA™

Ending Concrete Corrosion

ComposiCoat™ BP Concrete Coating

Product **Data Sheet**



ComposiCoat™ BP Concrete Coating

A two-coat TruComposite® system that chemically bonds to concrete for excellent water, chemical, and abrasion protection.

OVERVIEW

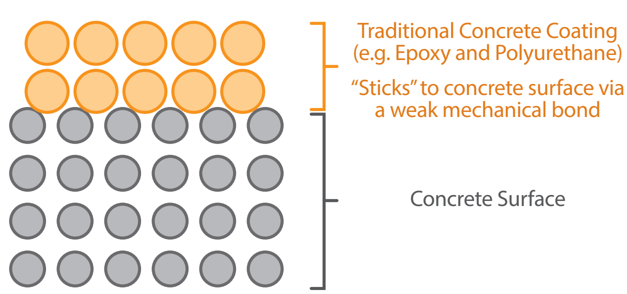
ComposiCoat™ BP is the ideal topcoat for applications where excellent chemical resistance and toughness are needed. This silane modified urethane hybrid coating chemically bonds with Zirconia's inorganic CeramycGuard™ base coat, creating a true composite coating system that brings the best of inorganic and organic coating technology into one composite system for excellent durability.

ComposiCoat BP provides superior chemical resistance, as well as providing protection from moisture and humidity as a waterproof vapor barrier. ComposiCoat BP also provides superior wear and abrasion resistance compared to traditional epoxies and urethanes on the market. Add to this, ComposiCoat BP is easy to clean and maintain and can even be spot repaired if damage is done to the surface.

When used with the CeramycGuard™ base coat, you have a composite coating system that has an inorganic base that chemically reacts or cross-links with the concrete. ComposiCoat BP directly cross-links with the CeramycGuard, giving the coating system the benefits of this advanced organic hybrid coating. The extreme crosslinking density of this system creates higher levels of chemical resistance. This composite system is not affected by freeze/thaw cycles, and cannot peel, flake, or delaminate.

The Problem

Concrete has a porous and chemically unstable surface that is vulnerable to degradation by chemicals driven into the surface by water and moisture. Traditional film-type coatings like epoxies, urethanes, and other paints, attempt to control this instability by creating a non-permanent barrier layer at the concrete's surface. These coatings are traditionally organic plastics that are unable to chemically bond with the concrete, and which only temporarily stick or grab onto concrete's surface texture to stay in place. These coatings quickly degrade and peel off, due UV sunlight vulnerability, and the inability to breathe out trapped water vapor. Then, moisture and chemicals enter the concrete causing carbonation and biological growth, leading to corrosion, cracking, rebar rusting, spalling, and eventual concrete failure.



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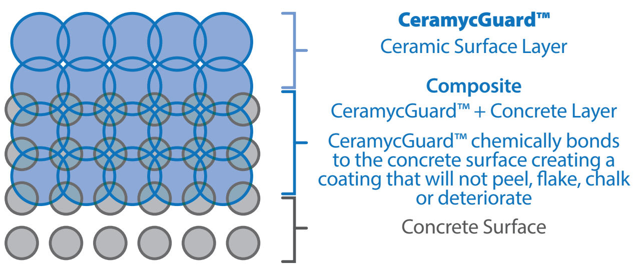
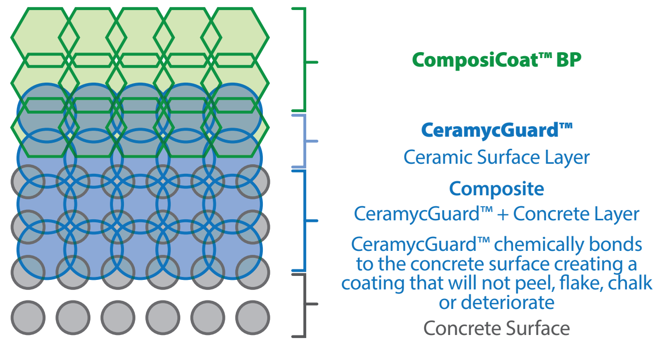
The Solution

This unique composite gives the owner the best aspects of both organic and inorganic chemistry. For instance, since this two-layer composite system is chemically bonded with the concrete, it cannot delaminate from moisture movement or freezing temperatures. Its exceptional toughness due to the wear resistance of the inorganic ceramic chemistry, mixed with the chemical resistance of the dense organic chemistry, making this coating system ideal for industrial applications. This technology strengthens, preserves, and protects concrete in a manner that cannot be achieved by other means.





Characteristics / Advantages:

- Superior impact and wear resistance
- Excellent chemical resistance (due to extreme crosslink density)
- Superior acid resistance
- Superior salt resistance (prevents ingress)
- Resistance to weathering (heat, humidity, wind-driven rain)
- Non-yellowing, UV stable protection
- Freeze-thaw resistant
- Impact resistant
- Anti-Corrosion (stabilizes concrete chemically)
- Green solvent

Biologically Impervious™ eliminates habitat, water, and oxygen for microbes. The oxidative (antimicrobial) potential of the ceramic never stops suppressing microbial life, and thus it supresses biofilm in concrete indefinitely. This is a huge benefit to food manufacturing and storage.

Sample Uses:

Food: manufacturing facilities, cold storage walls/floor/ceilings, food storage

General Construction: condominiums, parking garages, hangers, manufacturing, warehouse.

Commercial flooring such as loading docks, distribution centers, parking ramps
Infrastructure: wastewater, stormwater, bridges, dams (concrete anti-corrosion, anti-weathering)

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Testing
Wet acid abrasion test: This tests evaluates coated concrete under extremely harsh conditions, including food acid saturation during abrasive scrub cycles over time. The results are below:

While the ComposiCoat BP technology has a polymer sheen at the surface, the main wear layer is a dense, matte gray subsurface ceramic-organic composite layer. This ceramic-organic composite layer can take extreme wear and chemical attack. It does not peel, chip, or crack when exposed to harsh conditions (e.g., chemical, physical attack). Basically, it does not experience "catastrophic failure" like the Novolac Epoxy below in image 3; this sample disbonded from the concrete, and lost structural integrity in the epoxy film. The pull test removes only the coating, which is peeling from the surface.

1. ComposiCoat BP

2. 10,000 scrubs

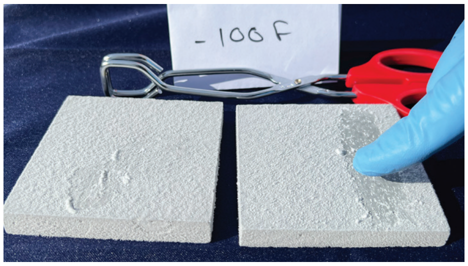
3. Novolac Epoxy Control (10,000 scrubs)

ComposiCoat™ BP was tested at 10,000 scrubs, images above. The samples were then removed from the wet abrasion device, rinsed with tap water, and allowed to dry. The test results show the following:

1. At 10,000 scrub cycles the following was observed:
   - The sheen element wears only over the surfaces' high points, exposing the matte ceramic-organic composite layer.
   - The ceramic-organic composite layer remains intact.
   - The ceramic-organic composite layer remains cleanable and easy to maintain.
   - The ceramic-organic composite layer remains a durable, protective, and anti-corrosive barrier for the concrete.
   - The majority of the surface layer in the low points remains unaffected by the food acid due to extreme chemical resistance.

The BP technology maintains a good coefficient of friction for non-slip as the composite wears. The ease of repair also makes it ideal for facilities managers to maintain.

Testing (cont)



-100 Fahrenheit Freeze/Thaw Test: This test involves placing prepared ComposiCoat B samples in a bath of dry ice below -100 Fahrenheit (dry ice is -109 F) over a 3-day period. This test has been performed on the same set of samples 3 times with no apparent damage. This is likely due to the dense molecular bonding between the concrete, ceramic, and organic phases of the composite system, which has the ability to expand and contract without damage due to its unique atomic structure. Also, this molecular bonding does not allow for disbondment. Image above: Samples removed from dry ice for viewing.

Pull Test: The industry standard pull test breaks out a chunk of concrete here, showing that the ComposiCoat BP has formed a composite with the concrete itself. This pull test breaks at over 1,000 PSI on concrete. This is the ideal condition, verifying the formation of a true composite system. Image above: upside-down aluminum pull-test fob with ComposiCoat BP/concrete pulled from coated concrete surface.

Hydrochloric Acid Test (ongoing): This test uses a coated red clay brick, which is submerged in 10% Hydrochloric Acid for 9 hours per day. To date, this test has gone on for 234 hours, or 26 days without failure. Image above: red clay brick coated with ComposiCoat BP, shown with HCL residue from submergence.

For more information contact: