

CONCRETE SURFACE TREATMENTS AND THEIR IMPACT ON ADHESIVE PERFORMANCE

Overview of Concrete Surface Treatments

Concrete substrates are often treated with a variety of compounds to serve different functions during construction and finishing. These treatments include:

- **Curing Agents:** Applied to control moisture loss during the early stages of curing, these agents help protect the surface of freshly poured concrete. Some curing agents form permanent membranes and may also act as sealers.
- **Primers:** Used on porous or dusty concrete surfaces to improve adhesion by creating a more stable base. Primers also help neutralize high surface alkalinity.
- **Sealers:** Designed to reduce moisture vapor emissions, these coatings seal the surface of cured concrete.
- **Bond-Breakers:** Typically used in tilt-up construction, these materials prevent newly poured slabs from bonding to the underlying surface.

Common Chemical Types

Surface treatments generally fall into the following chemical categories:

- **Water-based polymer emulsions** (acrylic, SBR, vinyl-acetate, etc.)
- **Solvent-based polymer solutions** (acrylics or other resins)
- **Silicate-based compounds** (sodium, lithium, potassium silicates)
- **Epoxies and urethanes**
- **Dissipative resin-based treatments**
- **Bond-breakers** (waxes, oils, silicones, fatty acids, etc.)



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Best Practices for Concrete Curing and Preparation

Proper curing requires consistent moisture and temperature conditions to ensure the concrete reaches full strength and durability. Ideally, moisture retention should be maintained through non-chemical methods such as water spraying or using wet burlap coverings during early hardening.

When chemical curing compounds are necessary, water-based acrylic emulsions are preferred due to their better compatibility with Lighthouse Adhesives. Solvent-based treatments are not recommended, as they may trap solvents that cause odor or interfere with adhesive bonding.

Additionally, adhesives from Lighthouse Adhesives are not warranted for use on concrete substrates treated with reactive silicates, whether applied topically or integrated during mixing. Any membrane labeled as “dissipative” or “bond breaker” must be fully removed before adhesive application.

Adhesive Compatibility and Warranty Limitations

For installations involving surface-treated concrete, Lighthouse Adhesives will only consider warranty coverage when the treatment meets these conditions:

- It is a low- or zero-VOC, water-based polymer emulsion.
- Preferably, the product should be acrylic-based and form a permanent membrane.

Even if surface treatments meet these criteria, all other substrate conditions (pH, moisture levels, porosity) must be within the recommended guidelines. Manufacturer-specific installation instructions for the floor covering must also be followed.



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Surface Treatment Removal

If an existing treatment must be removed, use mechanical methods such as:

- Grinding
- Sanding
- Shot-blasting or bead-blasting
- Scraping, sweeping, and vacuuming

Avoid using solvent cleaners, chemical strippers, or surfactant-based products, as these may leave behind residues that interfere with bonding.

Silicate Compounds – Special Warning

Silicate-based products (such as sodium, potassium, or lithium silicates) are commonly marketed as hardeners or sealers. These compounds often include surfactants and may vary in formulation. Lighthouse Adhesives does **not** recommend their adhesives for use on any surface treated with silicates and does **not** provide warranties in such cases, regardless of other warranties provided by other parties or suppliers.

Concrete Additives, Admixtures, and Surface Variations

Concrete formulations and finishes may vary widely, including:

1. **Additives** (e.g., plasticizers, dispersants, corrosion inhibitors)
2. **Admixtures** (e.g., polymers, silicates, waxes)
3. **Post-treatments** (e.g., curing agents, sealers, coatings)
4. **Surface finishes** (burnishing, polishing)
5. **Aggregate variations** (e.g., fly ash, slag, lightweight fillers)



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These materials and techniques can significantly affect surface properties such as:

- **Adhesive drying time**
- **Bond strength**
- **Moisture vapor emission rate (MVER)**
- **In-situ relative humidity**
- **Alkalinity and porosity**

Certain additives, especially wax-based dispersions, may even rise to the surface and act as unintended bond-breakers.

Bond Testing Procedures

A water absorption test can be used to assess concrete porosity. Place a bead of water on the slab and monitor the absorption rate. Slow absorption may indicate a non-porous surface that requires mechanical preparation.

To ensure compatibility with flooring adhesives, a **bond test** should be conducted:

- Apply a small section (approx. 2' x 2') of floor covering using the intended adhesive and method of installation.
- Leave undisturbed for 12–24 hours.
- Inspect for proper adhesion by checking for peeling or weak bond strength.

If the bond is insufficient, the substrate will likely require further mechanical profiling, such as scarifying or bead-blasting. This bond testing process should also be applied when evaluating the compatibility of sealers or other surface coatings.



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⚠ Note:

This document is for general reference only. While the information provided is based on the industry's best practices, Lighthouse Adhesives does not accept responsibility for any errors or liabilities resulting from the use or interpretation of this guidance.

