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Concrete Curling / Grinding CS2000-Treated Slabs Technical Bulletin

Concrete curling is a frequent challenge for concrete slabs and the placement of resilient flooring systems. Curling results from volumetric changes associated with “differential moisture loss from [the] concrete slab to the surrounding environment. This distortion can lead to conflicts with respect to installation of some floor coverings in the months after concrete placement.”¹ When curling occurs, it can add considerable remediation costs to construction projects. Curling may result from ambient humidity and temperature shifts causing the rapid loss of moisture, either as a function of external climate conditions, or as a function of enclosing and acclimatizing a building.

CS2000 is a moisture-control system applied the day of the concrete pour, which also acts as a curing agent by maintaining concrete Relative Humidity (RH) levels at around 98% during the first 28 days. As the slab continues to hydrate, utilizing the available water of necessity and water of convenience, internal RH values normalize at levels that are the same as an untreated CS2000 slab.² Installing CS2000 will not cause a concrete slab to curl; rather, CS2000 can help prevent curling by maintaining internal RH in the early stages of curing. CS2000 is fully compatible with all common curing methods utilized during concrete finishing.

When concrete curling produces flatness and levelness readings outside of project specifications, the curling must be remedied prior to the installation of flooring system. There are several options:

Grinding. The most common remedy for a slab that has curled beyond the requisite Floor Flatness (F_F) and Floor Levelness (F_L) specifications, or the common specification of 3/16” over 10’, is grinding.³ Grinding is required to remove high spots, typically an 1/8” or greater from the slab surface, to produce a flat, smooth slab for flooring installation, and to ensure building components such as doors can be correctly installed.

Topping. Another common curling remedy prior to the installation of flooring, is to self-level or skim-coat the slab surface to levelize depressions and low areas. Leveling an entire slab that has curled can be an expensive remedy, and is often used in conjunction with grinding down high areas.

Re-pour the Slab. By far the costliest remedy to remediate concrete curling is to rip and replace the slab entirely. This typically occurs where curling is egregious, or the specified F_F and F_L numbers require precision tolerances in conjunction with a burnished or polished finish.

Different grinding remediation procedures result in considerations for moisture control systems, especially topically-applied surface treatments such as the Creteseal® CS2000 Spray-Apply System.⁴ Where a concrete slab

¹ ACI 302.1R-15, *Guide to Concrete Floor and Slab Construction* p.10.

² See OBEX TB 18-C2-04 CS2000 Treated Concrete Internal Relative Humidity.

³ ASTM F710 section 4.6: “Concrete floors shall be smooth to prevent irregularities, roughness, or other defects from telegraphing through the new resilient flooring. The surface of concrete floors shall be flat to within the equivalent of 3/16 in. (3.9 mm) in 10 ft, (as described in ACI 117R, or as measured by the method described in Test Method E1155 or any industry-recognized method specified).”

⁴ With Moisture Vapor Emission- and Relative Humidity-Reducing admixtures such as Creteshield® Ultramix, grinding to remediate concrete curling requires no special remediation techniques prior to flooring installation, as the technology is incorporated throughout the entire slab.



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has been treated with CS2000, and there is substantial curling along control joints or slab edges necessitating extensive grinding (1/8" or greater removed from the surface), the CS2000-densified surface layer has been compromised, such that moisture vapor emissions (MVE) can freely pass through the slab and damage the flooring system.

OBEX remediates slabs that have been ground down 1/8" or greater by treating the entire slab with Creteseal® MAX to maintain the 15-Year Warranty. OBEX's policy, when a slab has curled 28 days or later following the CS2000 installation, is to credit the cost of the CS2000 system toward the material cost of the Creteseal® MAX retrofit system. For Owners and General Contractors, this carries an incremental material cost on projects, as well as labor and installation costs of the retrofit system prior to flooring installation. Typically, with use of an OBEX-preferred installer, the schedule impact for a Creteseal® MAX retrofit installation is a minimal 1-3 day timeframe. Approached in this manner, there is virtually no risk when choosing to use a proactive day-of-pour solution such as Creteseal® CS2000. If the slab remains flat and level within project tolerances, the flooring is protected by the OBEX 15-Year Warranty, and for a slab that curls, the cost is the same as it would have been to install a two-part epoxy retrofit system to have the flooring system protected by the OBEX 15-Year Warranty.