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CS2000 MOISTURE CONTROL TESTING TECHNICAL BULLETIN

Creteseal® CS2000™ is a penetrating concrete sealer designed to protect the finished resilient flooring system from damage caused by moisture vapor emission and alkalinity. Concrete treated with CS2000™ is fully compatible with all floor coverings and adhesives. When Creteseal® CS2000™ is installed on new concrete slabs, it penetrates the surface of the concrete, reducing the slab's capillary size thus reducing MVER. When CS2000™ is installed, OBEX warrants against excessive negative-side vapor emission and alkalinity transmission. In order to provide a warrantable installation, testing negative-side moisture rates prior to the installation of the finished resilient flooring will confirm that the MVER does not exceed flooring manufacturer requirements and the installation complies with ASTM F710 *Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring*. Prior to the installation of the finished resilient flooring, Anhydrous Calcium Chloride tests are the industry standard method (ASTM F1869) for measuring negative-side Moisture Vapor Emission Rates (MVER) in concrete slabs.

Anhydrous Calcium Chloride testing is not always perfectly accurate and OBEX cannot guarantee test results will always be accurate—for this reason testing is performed by an independent third party. Despite being the only quantifiable, industry-accepted method of measuring MVER, there are numerous factors that may contribute to the accuracy of test results. To help ensure accuracy, the space must be enclosed and properly acclimated with HVAC systems running prior to, and during, testing. Internal humidity levels must be controlled in a manner consistent with probable conditions when the space is occupied. Stable, consistent environmental conditions may be difficult to achieve during most of the construction phases, and as a result testing in an uncontrolled environment may result in inaccurate test results. For this reason, it is critical that ASTM F1869 acclimation requirements be followed for accurate moisture testing.

When conducting Anhydrous Calcium Chloride (ASTM F1869) testing, OBEX recommends cleaning or lightly sanding the concrete surface in test locations, rather than grinding the surface of the concrete. Grinding the concrete substrate will damage the CS2000™ moisture control system at the surface of the concrete, undermining the system and allowing the potential for excess moisture to concentrate and transmit out of the slab in that location. Not only would grinding the test locations produce inconsistent test results, but the CS2000™ moisture control system will be compromised which may result in a premature resilient flooring system failure. A CS2000™ treated slab, tested in accordance with ASTM F1869, without grinding the concrete surface, will typically result in an MVER range of 3 to 5 lbs. depending on local conditions. OBEX recommends CS2000™ treated slabs be tested prior to the installation of the finished resilient flooring system to ensure warranty coverage.

The second most common testing procedure for concrete slab moisture content is Relative Humidity (RH) testing using in-situ probes in accordance with ASTM F2170. Relative Humidity testing measures how far along the slab has cured and hydrated, as internal slab moisture gets used up during the curing/hydration process. However, internal RH testing only identifies moisture levels within the interior of the slab at a given moment in time and does not describe the potential for excessive MVER that may ultimately undermine a finished resilient flooring system. CS2000™ prevents internal moisture from transmitting to the adhesive and resilient floor system by hardening and densifying the porosity of the upper surface of the concrete slab.



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Addressing the RH probe test, ASTM F1869 states: “While there are probe tests conforming to ASTM F2170, the results deliver only the relative humidity of the substrate. While this can be effective for measuring the rate of drying or evaporation of the Water of Conveyance (WOC), it cannot produce a quantifiable rate of vapor transmission.” Therefore, Relative Humidity (RH) testing may not provide an accurate indication of the CS2000™ product’s moisture control performance. Further, a high RH reading for a CS2000™-treated slab may be indicative the product is performing as specified—the CS2000™ moisture control system limits moisture vapor emission levels from the concrete surface to permissible levels to protect the floor covering system. When RH testing is conducted on a CS2000™ treated slab, all RH probes and plastic sleeves must be removed completely from the slab and the holes they occupied must be filled with a polyurea epoxy patching compound prior to placing the resilient flooring system to comply with CS2000™ warranty provisions.

Flooring manufacturers ultimately dictate which moisture testing types will be utilized to verify the slab is ready for flooring system, and OBEX recommends following flooring manufacturer requirements and ASTM F710. Regardless of testing methods employed, OBEX recommends these steps to ensure a successful finished resilient flooring installation:

- Follow all flooring material manufacturer recommendations and installation procedures.
- Acclimate the room in accordance with flooring manufacturer’s recommendations regarding temperature, humidity and dew point prior to installing resilient flooring materials.
- Fully clean all saw cuts, cracks, voids, control joints, construction joints, and expansion joints (mechanically “V-groove” as necessary – see related OBEX Technical Bulletin) and fill completely with a moisture-resistant patching compound or joint-filler material.
 - OBEX recommends using a polyurea epoxy patching compound that is compatible with the flooring manufacturer’s flooring materials. Do not use gypsum material to fill or patch.
- CS2000™ is a penetrating sealer that seals the surface of the concrete substrate. Any grinding, cutting, or trench work will remove concrete treated with CS2000™. Please notify OBEX for proper remediation of any areas of the concrete slab so affected.
- Prior to the installation of the resilient flooring system, follow ASTM F710 to fully clean the concrete slab surface of all construction debris, contaminants, cleaning solutions, paints, solvents, and other materials.
- Ensure the adhesive is compatible with the flooring manufacturer’s resilient flooring product.

In summary, the only reliable way to test CS2000™ is the Anhydrous Calcium Chloride test / ASTM F1869. Relative Humidity testing in conjunction with Calcium Chloride Testing can provide a more complete picture of the slab moisture condition, but Relative Humidity testing will not measure CS2000™ efficacy. CS2000™ works by mitigating moisture vapor emissions from the concrete surface, protecting resilient flooring systems from what might otherwise be unacceptably high, damaging rates of MVER.

The OBEX warranty covers failures to the flooring system, as originally installed on Creteseal® CS2000™, for a period of fifteen (15) years due to negative-side moisture vapor emission and/or alkalinity failure. The OBEX warranty does not cover failures due to defective flooring materials or improper installation, or due to a failure to follow ACI guidelines and industry standards for concrete placement. Please see the full text of the warranty document for a list of coverages and exclusions.