

## Moisture and pH Testing of Concrete Substrates

Excessive moisture and/or high pH on any flooring substrate, especially concrete, can cause product failure and be costly to deal with if not identified and remediated appropriately prior to the installation of primers, adhesives, and floor covering products.

Issues with floor moisture have become more frequent and difficult to identify. Changes in concrete composition, high recycle content concrete, the variety of curing and sealing compounds commonly used, different surfacing techniques, fast track construction schedules, and the practice of not running HVAC systems to help acclimate concrete prior to testing, all contribute to the difficulty of accurately assessing the concrete condition.

Tandus requires three moisture tests to be completed within the first 1000 sq ft of concrete on each floor and one moisture test to be completed within each additional 1000 sq ft in order to gain a more complete understanding of the concrete condition. Tandus also requires that 50% of these tests be conducted according to ASTM standard F-1869-04 (Std. Test Method for measuring Moisture Emission Rate of Concrete), and 50% of the tests to be conducted according to ASTM standard F-2170 (Std. Test method for measuring Relative Humidity in Concrete). Results from both test methods must meet Tandus product specific requirements prior to installation.

ASTM Standards F-1869-04 and ASTM F-2170-02 require the temperature of the indoor environment to be 75°F +/- 10°F and relative humidity between 10% and 65% for 48 hours prior to and during testing. Experience has shown that more accurate and representative test results can be attained if the HVAC is operational 24/7 for two weeks prior to testing. HVAC systems that induct and exhaust outside air with no temperature or humidity controls do not assist in the acclimation process for this testing.

When using Tandus Powerbond products, the moisture vapor emissions rate (MVER) must be no greater than 3.0lbs and the relative humidity (RH) must be no higher than 75%. The only exception is Tandus Powerbond Cushion when used in conjunction with #54 Seam Weld or C-XL Water Based seam sealer. In this case, the MVER must be no greater than 10lbs and the RH must be no higher than 90%.

When using Tandus Modular Tile, the MVER must be no greater than 3lbs and the RH must be no higher than 75%. The exception is Tandus ER3 Modular Tile for which the MVER must be no greater than 5lbs and the RH must be no higher than 80%.

When using Tandus broadloom products, the MVER must be no greater than 5lbs and the RH must be no greater than 75%. The MVER and RH requirements for these products are due to the performance limitations of conventional adhesives commonly used. The required MVER and RH levels for broadloom products may be increased by using project specific adhesives, but only when installed over conventional concrete flooring substrates. Consult Tandus Technical Service to determine if the installation application and flooring substrate will allow for the use of adhesives with higher moisture limits.

Both MVER and RH testing indicate point-in-time moisture levels of concrete and do not provide static information. The moisture levels in concrete can change by increasing or decreasing after testing and Tandus is not responsible for product failures that occur due to increases in MVER or RH in excess of the product requirements post installation. Each moisture test site will be assessed individually. Averaging of results is not an acceptable means to establish the condition of the concrete substrate.

The ASTM standard for testing the pH of concrete is F-710-05. For all Tandus products, the surface pH of the concrete flooring substrate must be between 7 and 9 and absolutely must not exceed 9. A minimum of one test per 1000 sq ft is required, however, multiple tests per 1000 sq ft will provide more accurate and complete understanding of pH levels across the entire flooring surface. To insure an accurate pH reading at the surface of the concrete, the concrete surface must be adequately cleaned of any adhesives, primers, curing compounds, surface contaminants, etc.

Tandus C-36 Primer, C-46 Primer, C-12 Access Panel Adhesive (Flex-Aire Tile Only), C-14 Adhesive, C-EX Adhesive, and C-16 adhesive all require a MVER of no greater than 3lbs and RH no higher than 75%. When used with ER3 Modular Tile or Powerbond Cushion the required MVER and RH levels are raised to the allowable limits for those products as indicated above. In all cases, the pH must be between 7 and 9 and absolutely must not exceed 9.

Tandus Greenbond B-19 Adhesive used with broadloom products requires MVER of no greater than 5lbs, and RH no higher than 75%.

Tandus product warranty is void if the required MVER, RH or pH limits of the subsurface, as indicated above, are exceeded at any time. Tandus does not represent or make any expressed or implied warranties that Tandus products will or will not affect, prevent or cure any other moisture or alkalinity-related issues that may arise because of the moisture and alkalinity levels found in the concrete. Tandus expressly disclaims such expressed or implied representations or warranties.

If you have any questions regarding this subject matter, please contact Tandus Technical Services or Field Technical Services at 800-241-4902.