

Concrete Slab Sweating

Concrete that is experiencing water vapor moving through the slab to the surface and concrete that has condensation from the air onto the surface of the concrete both look much the same – water collecting on the surface of the concrete. Because water vapor moving through a slab is a problem for many adhesives and flooring materials there is usually a need to determine the source of the water so that the appropriate measures can be taken to minimize the risk of floor system failures.

The accumulation of water droplets from the air onto a concrete surface, condensation or sweating, occurs due to temperature differences between the air and the concrete. This condition is usually caused by warm air entering a structure through doors and windows and coming into contact with cooler concrete surfaces. If the concrete surface is at a lower temperature than the dew point, condensation may occur. This is the same phenomenon that causes the surface of a cold drink can to have water droplets form on its surface on a warm day. The condition often, but not always, occurs in new buildings that have not yet had the HVAC systems operating or have not had doors and windows installed or in open warehouse spaces with little to no HVAC to control the temperatures and humidity.

Thankfully there is a relatively easy test that can be performed to determine if the water on the surface of a concrete slab is coming from the air or if it is moving through the slab. Start with a slab that is dry to the touch. Carefully tape at least a 3-foot by 3-foot piece of 6-mil or thicker polyethylene sheet to the slab. Make sure that no gaps are present between the plastic and the slab. Allow the plastic to remain in place for three days, then remove it. If water droplets are present on the top surface of the plastic, or if no



Figure 1: Plastic test square (from constructor.org)

moisture is present, the problem is likely condensation. If water droplets are present on the underside of the plastic, the likely cause is water vapor transmission through the slab.

If the problem is condensation, having doors and windows installed and HVAC operational will often solve the problem. If envelope closure and HVAC does not solve the problem, dehumidification or other measures may be required. If the problem is determined to be water vapor transmission through the slab, Spray-Lock Concrete Protection can provide solutions to your project to help the project's flooring installation stay on schedule.