

The Truth About VOCs

What are VOCs?

According to EPA's Terms of the Environment, a volatile organic compound is "any organic compound that participates in atmospheric photochemical reactions except those designated by the EPA as having negligible photochemical reactivity."

What are acceptable levels of VOCs in duct sealants and mastics?

According to the SMACNA¹ Technical Resource Bulletin (TRB) #9-09 issued in July 31, 2009 as an update to TRB #4-09 issued in March 27, 2009, The USGBC² issued the following ruling on how to classify duct sealants for application under Credit 4.1. Project teams can classify duct sealant under the "Other" category in the SCAQMD³ Rule #1168 VOC Limits table.

This category of "Other" limits the VOC maximum limits of 420 g/l. This limit should allow proper duct sealing on LEED⁴ projects and will permit proper sealing of ductwork at temperatures below 40 F° (5 C°). The previous TRB #4 issued in April 2009 had the SCAQMD considering HVAC duct sealant as an "Architectural" sealant, which limits the VOCs to 250 g/l.

Hardcast duct sealants and mastics, both water-based and solvent-based, are below the LEED limit, qualify for LEED credit contribution and are below the requirements for SCAQMD.

All VOCs contained in Hardcast sealants are in the product to guarantee and enhance performance. Hardcast also does not use exempt solvents that could be dangerous to the applicator or building occupant. Recent failures in certain "zero" VOC products have led other manufacturers to realize this is not a race to zero. Ultimately the duct sealant must perform for the life of the duct as a sealant, the product must not be a food source for bacterial growth and it must be stable in the container prior to application.

How can there be VOCs in a water-based duct sealant or mastic?

Carlisle HVAC/Hardcast adds VOCs to comply with being listed as a UL-181 A-M and B-M approved duct sealant. It is important to understand that the VOC's in a water-based duct sealant or mastic are added to protect the product in the wet-state. Once the products are applied and fully cured the VOC's will be gone. UL-181 requires the duct sealant/mastic to pass 5 freeze thaw cycles to the following schedule:

- The mastic is to be subjected in its original container to five freeze-thaw cycles, each cycle consisting of:
 - a) 16 hours at 0 ±2EF (minus 17 ±1EC);
 - b) 8 hours at 73.4 ±2EF (23 ±1EC); and
 - c) 7 days at 122 ±2EF (50 ±1EC).

Carlisle HVAC/Hardcast adds VOCs as a fungicide which is also required by the UL-181 requirements per the following procedure:

- Mold mycelia and spores from Chaetomium Globosum are to be applied to the adhesive side of the specimens. The specimens are to be placed in a closed vessel in which an atmosphere saturated with water vapor is maintained at room temperature under dark conditions. The specimens are to remain in this atmosphere until the maximum extent of growth has been demonstrated, or until the mold and spores have disintegrated, but not less than 60 days.
- The specimens then are to be examined visually for extent of mold and for indications of deterioration of the tape specimens. The mold shall not have spread beyond the inoculated area, and no significant growth of mold shall be observed.

Summary

Contrary to the belief that having a zero VOC product is good for the environment, the spreading of microorganisms throughout the HVAC system is detrimental to a building's IAQ (Indoor Air Quality), plus not being able to apply duct mastic in the wintertime will limit cold weather construction projects. Hardcast branded sealants will meet or exceed the UL-181 requirements by complying with mold/fungi and freeze/thaw requirements. Hardcast duct sealants and mastics have never had an occurrence of mold growth on the mastic in the pail prior to application or after its been applied.

¹ SMACNA- Sheet Metal Air Conditioning Contractors' National Association

³ SCAQMD- South Coast Air Quality Management District

² USGBC- United States Green Build Council

⁴ LEED- Leadership in Energy and Environmental Design

