



Adhesion and Compatibility

The Unsung Essentials Among Installation Sealants

BY RICHARD RINKA

Sealants represent a very small part of the cost of an overall wall system, but play a major role in the integrity of a residential or light commercial building's roof-to-ground weather resistant barrier (WRB). They do so under significant pressures, by providing protection that must remain intact despite being stretched or compressed due to thermal movement, wind load pressures, operation of windows or doors, settling of structures and other forces.

For this reason, many factors must be considered in choosing the right sealant for a given application. Key among them are:

Adhesion

Many kinds of materials are encountered in window and door installation, including aluminum, glass, brick, concrete, mortar, exterior insulation and finish systems (EIFS), etc. Adhesive strength represents a sealant's ability to remain bonded to those materials, which it must do securely and continuously, lest it will fail when subjected to tensile stress. In many cases, and depending on the variety of substrate material, a primer may be also required to ensure proper bonding.

Adhesion is usually verified by a "peel test," per ASTM C794, *Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants*, a laboratory procedure in which a sealant is applied to a substrate sample, allowed to cure, and then pulled off at a 90-degree angle. This helps to determine the adhesion of a sealant to various substrates.

Joint Movement

The type and extent of expected movement among joints to be sealed must also be considered. The sealant must provide a weathertight bond that remains intact despite movement due to thermal expansion, windload, settling of the structure or seismic activity. Testing to verify the ability to

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accommodate such changes is conducted and sealants may be labeled in accordance with ASTM C920. The amount of movement is detailed by material class with larger numbers able to handle greater variances.

Compatibility

Compatibility refers to a product's interaction with other sealants and adjacent accessory materials, such as gaskets, spacers, shims, flashing and setting blocks. Incompatibility can result in loss of adhesion, becoming brittle, softening, increased tackiness, bleeding, lack of cure or unsightly staining.

Testing to verify compatibility with various materials is performed according to ASTM C1087, a laboratory screening procedure in which glazing sealants are placed in contact with

accessories, then exposed to heat and ultraviolet light. Among the relevant observations, yellowing or discoloration of the sealant is an indicator of incompatibility.

Of course, you don't have to go it alone when making selections. Guidance is available for the selection and application of sealants, as well as for the proper design of joints and glazing to which they're applied. Chief among these is AAMA 800, *Voluntary Specifications and Test Methods for Sealants*, which lists performance requirements and associated test protocols for seven different types. Products eligible for component verification under the AAMA fenestration product Gold Label certification program must meet the AAMA 800 specifications.

In addition, a good overview and primer is provided by AAMA 851-09, *Fenestration Sealants Guide for Windows, Window Walls and Curtain Walls*, which summarizes selection considerations, classification and forms of sealant, joint design and movement, along with the measurement of sealant characteristics (adhesion, cohesion, hardness, elasticity, UV exposure, etc.). More details on the selection and use of sealants can also be found in the AAMA InstallationMasters® training and credentialing program.

Sealants have a big job when it comes to doors and windows, so it pays to get it right. ■

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