



Proper Sealants Help Ensure Installed Performance

BY KEN BRENDEN

Although doors and windows are susceptible to moisture intrusion or excessive air infiltration, where leakage or draft problems occur, they are not necessarily due to faulty window design. AAMA-certified products that meet the code-mandated fenestration standard AAMA/WDMA/CSA 101/I.S.2/A440-08 or its predecessors must pass various structural loading, operating force, forced entry, water penetration and air leakage resistance requirements in addition to numerous durability tests.

But these standards and tests do not account for the performance of the window after installation—the source of most air leakage or water penetration problems attributable to windows. While the former affects occupant comfort and energy efficiency, the latter can lead to costly deterioration and promote the growth of mold and mildew in wall cavities.

The Key is in the Barrier

The solution focuses on the integrity of the “drainage plane” of the exterior wall. The drainage plane consists of a weather-resistant barrier (WRB)—often composed of tar paper, but also felt, house wrap, etc.—installed behind the exterior cladding and coupled with flashing. It provides a path for moisture that penetrates the cladding system to move down and away from the building. In all cases, the essential principle of window installation is that the window units must work together with the exterior facing material, sheathing and the WRB to form a fully integrated and effective drainage plane. The proper use of

flashing and sealants to seal the joints between the rough opening and the window frame plays a key role in achieving this objective.

The right sealant for a given application must meet several requirements. It must provide a weather-tight seal that retains its integrity despite thermal or seismic movement or structural forces due to wind load or settling. It also must be capable of absorbing stress without transferring it to the glass. Meanwhile, it must retain its properties while resisting the effects of water and ultraviolet radiation over time. Consideration must also be given to the type of surface to which the sealant must adhere (a primer coat being necessary for some to ensure bonding), the configuration of the joint to be sealed and the compatibility of the sealant with other materials.

Critical performance characteristics of a sealant are its adhesive strength, cohesive strength, recovery ability after deformation, tensile strength and durability under the effects of weathering. The importance of adhesive and cohesive strength is self-evident. Unless the sealant adheres securely to the substrate, it will fail when subjected to tensile stress. Cohesive strength is equally important, as a material that lacks the strength to “hold itself together” cannot provide a suitable seal. Other attributes include hardness, thin film integrity, elastic recovery, permanent set and compression set, peel adhesion, yield strength, slump, sag, low-temperature flexibility, ultraviolet resistance and water absorption.

Standards Can Guide the Way

Fortunately, guidance is available for the selection and application of sealants, as well as for the proper design of the joints and glazing to which the sealant is to be applied:

- AAMA 800-08, *Voluntary Specifications and Test Methods for Sealants*, is a compilation of standards, specifications and test methods for determining the performance of compounds, sealants and tapes.
- AAMA 812-04, *Voluntary Practice for Assessment of Single Component Aerosol Expanding Polyurethane Foams for Sealing Rough Openings of Fenestration Installations* provides test methods for determining the expansion properties of the foam and allows the user to relate them to their probable effect on fenestration framing.
- AAMA 850-91, *Fenestration Sealants Guide Manual*, is a guide for the selection, use and application of sealants for factory or field glazing as well as weather-seal applications.

In recognition of the difference between sealants used in the assembly of doors and windows and those used in their installation, the March 2009 issue of the AAMA Verified Components List was the first to provide component listings in two individual parts: *Part One-Components of Certified Windows and Doors*; and *Part Two-Materials and Components Used for Installation*. ■

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