Under Wraps
Guidelines for Profile Laminations Ensure Long-Term Performance

BY RICHARD RINKA

In order to assure that they’re capable of standing up to exposure to the elements, doors, windows and skylights must be made of profile materials that meet industry consensus standards for substrate materials. The same is true for their coverings. Coatings and laminates must be compatible and equally durable. These requirements give specifiers a reliable indication of a profile’s ability to resist potential damage, or degradation, due to exposure to heat, moisture, ultraviolet (UV) radiation and impact of windborne debris, plus chemicals involved in installation and ongoing maintenance.

To be deemed as conforming to the North American Fenestration Standard (AAMA/WDMA/CAS 101/IS.2/A440) and certifiable under the AAMA Certification Program, windows must be made from extrusions that comply with the appropriate AAMA or other industry consensus substrate standard. These typically cover performance factors such as: dimensional stability, impact resistance and color fastness under extended weathering; heat resistance without blistering, cracking, crazing, flaking or delamination; hardness; weight tolerance; heat build-up without deformation, and absence of lead. For profiles made of vinyl or fiberglass, compliance can be established through certification under the AAMA Extrusion Certification Program.

Coatings

When it comes to performance of coatings and finishes for such profiles, a separate tier of standards applies, including for anodizing of aluminum, organic coatings for wood, aluminum and polymeric framing, as well as stains for wood and fiberglass.

Profiles made of vinyl or fiberglass are certified under the AAMA Extrusion Certification Program through randomly selected samples that are tested by accredited third-party laboratories.

Meanwhile, decorative laminates applied to PVC, fiber reinforced thermosets, finished aluminum and reinforced thermoplastics must be subjected to an adhesive bond strength test, as well as a boil test (or, optionally, a heat resistance test) as defined in substrate standards AAMA 303, 305 or 310, as applicable. Those tests include means for evaluating the strength of the adhesive bonding laminates to substrates. A static mass test method, or a tensile test method—both of which are described in detail in AAMA 303 and 305—is applied after conditioning at room temperature. A force of 11 lbs./in. (10 N/mm) is applied to a one-inch wide tear strip for a period of one minute. To pass, there can be no evident degradation of bond strength.

A boil test is also prescribed. It subjects samples of the laminated substrate to one hour of immersion in boiling distilled water. As a result, there can be no degradation of bond integrity per the bond strength test and no separation of the veneer or film layer.

Laminates

Factory-applied interior or exterior decorative laminates must also comply with the requirements of separate standards devoted to their performance, AAMA 307 or AAMA 312, as applicable. For example, AAMA 307 requires weathering performance (external laminates must meet defined impact strength and color-hold guidelines after outdoor weathering exposure at intervals of six, 12 and 24 months; interior laminates must meet color hold guidelines after 2,000 hours of laboratory exposure to ultraviolet radiation). It also requires demonstrated resistance to...
chemicals such as muriatic acid, mortar and detergent, without loss of laminate adherence when subjected to a tape pull-off test, blistering or any other change in surface appearance. Lead content must be less than 0.02 percent by weight, and the laminate must exhibit compatibility with sealants that meet AAMA 800 standards for sealant and adhesive performance.

Laminates on wood and cellulosic composite profiles must meet the adhesive bond strength defined in AAMA 312. In addition, the laminate color, embossing and bond integrity must be free of veneer or film layer separation and must also comply with criteria established between the laminator and fenestration manufacturer.

To simplify the process of evaluating and comparing laminate finishes, the laminate performance requirements found in these AAMA documents are in the process of being consolidated into a new version, tentatively identified as AAMA 664. The new document is expected to be published in 2019.

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