CERTIFICATION AGENCY INTERPRETATION:
2020 NGBS Chapter 7 Fenestration Air Leakage

Fenestration Air Leakage 701.4.3.4

Summary

NGBS 701.4.3.4 is a mandatory practice that specifies maximum air leakage rates for windows, skylights, sliding glass doors, and swinging doors. The NGBS requires fenestration products to be tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory, as well as listed and labeled. This practice applies to fenestration in any building seeking NGBS Green certification: single-family; townhomes; multifamily; and mixed-use buildings.

Two compliance issues have arisen. First, Verifiers claim it is difficult to determine compliance for residential doors because they are not as commonly labeled as windows. Second, the windows and doors typically used for multifamily and mixed-use buildings follow a different reference standard for performance.

Discussion

The NGBS includes definitions for two different window types:

(1) FENESTRATION PRODUCT, SITE-BUILT. A fenestration designed to be made up of field-glazed or field-assembled units using specific factory cut or otherwise factory-formed framing and glazing units. Examples of site-built fenestration include storefront systems, curtain walls, and atrium roof systems.

(2) FENESTRATION PRODUCT, FIELD-FABRICATED. A fenestration product whose frame is made at the construction site of standard dimensional lumber or other materials that were not previously cut, or otherwise formed with the specific intention of being used to fabricate a fenestration product or exterior door. Field fabricated does not include site-built fenestration.

Site-built fenestration products are exempt from the NFRC 400 or AAMA/WDMA testing requirements but must be verified as meeting the air leakage value through independent laboratory testing. Field fabricated fenestration products are exempt from the air leakage practice entirely. Unfortunately, most **residential doors** are neither site-built or field-fabricated; therefore, there is not an exemption in the NGBS for doors from the testing, listing, and labeling requirements. Thus, Home Innovation cannot exempt residential doors from this requirement, and Verifiers are encouraged to speak to clients early in the planning and design process to inform them of the need to select doors that don't exceed the 701.4.3.4 practice limits when tested by an independent laboratory.

Second, **commercial fenestration products**—windows and doors of various styles, including metal framed swinging glass doors, sliding doors, and revolving doors—are not tested and labeled to NFRC 400 or AAMA/WDMA, but instead are tested commercial code provisions. IECC Section C402.5 establishes UFactor and SHGC values for fenestration within commercial buildings.

It is unclear why the NGBS does not specify Table C402.5.2, as that table establishes maximum air leakage rates for commercial fenestration assemblies and is analogous to the residential fenestration air leakage provisions within 701.4.3.4. Table C402.5.2 is a more comprehensive list of product types than that included in 701.4.3.4, with many commercial style products, including storefront glazing, power-operated sliding doors, and revolving doors, included. Air leakage values range from 0.20 up to 1.30. The item cites multiple acceptable test methods.

Conclusion

For residential doors, NGBS compliance requires compliance with 701.4.3.4. Knowing that residential doors are not always readily labeled, Verifiers should work with clients early in the design process to ensure that compliant doors are specified in the plans. The NFRC Certified Product Directory can serve as a resource to find compliant doors. ENERGY STAR labeled products within that Directory indicate that a product has met both efficiency requirements and the air leakage limit specified in the NGBS.

In lieu of "listed and labeled" window and door products, Home Innovation allows products to be verified with a testing report from an accredited third-party laboratory. Guidance related to acceptable testing laboratories is in the **Verifier's Resource Guide**.

For commercial doors, Home Innovation recognizes that it is likely an oversight that 701.4.3.4 only references to testing standards commonly used for residential products and consequently, we allow commercial fenestration products to demonstrate independent testing to demonstrate C402.5.2 compliance as a substitute for 701.4.3.4.