

Codes and Standards Updates Offer Vinyl Siding Industry Opportunity to Demonstrate Rigorous Performance

By Matthew Dobson, Vice President, Code & Regulatory, Vinyl Siding Institute, Inc.

Recent important and welcome updates to ASTM International standards—the *International Building Code (IBC®)*, *International Energy Conservation Code (IECC®)* and *International Residential Code (IRC®)*—provide continuous improvement to sound building code framework, bringing additional clarity and confidence to the construction community that specifies vinyl and other polymeric siding and the building officials who regulate them.

The 2015 standard and code updates not only demonstrate the polymeric siding industry's commitment to consistent high performance, they also bring two other polymeric sidings into the mainstream: polypropylene siding and insulated vinyl siding (a form of insulated siding). As part of the recently released 2015 I-Codes:

- Insulated vinyl siding is fully defined as a form of continuous insulation in the IRC and IECC, and required to be certified by a third-party to the ASTM standard for insulated vinyl siding (ASTM D7793). This requires a minimum thermal resistance rating of at least R-2.0, as well as meeting or exceeding normal cladding performance tests for weathering, wind load and impact resistance, among other events;
- Insulated vinyl siding and polypropylene siding were added to Chapter 7 of the IRC, which means they must conform to their established product standards, D7793 and D7254, respectively, and be verified by an "approved quality control



agency," just as vinyl siding was required to conform to ASTM D3679 beginning in 2006;

- The installation provisions for vinyl siding in Chapter 7 of the IRC were clarified and enhanced;
- Similar installation provisions were added for polypropylene siding and insulated vinyl siding to Chapter 7, including new entries to Table R703.3 (1).



Types Polymeric of Siding

Definitions (as defined by the I-Codes)	Key References in 2015 I-Codes
<p>VINYL SIDING. A shaped material, made principally from rigid polyvinyl chloride (PVC), used to cover exterior walls of buildings.</p>	<p>IRC—TABLE R703.3(1) installation requirement, R703.11 product certification requirements, 703.11.1 installation requirements, 703.11.2 installation requirements for over foam sheathing IBC—TABLE 722.6.2(3) prescriptive fire rated assembly application, 1404.9 certification requirements, 1405.14 installation requirements, 1406 performance requirements for use in commercial construction,</p>
<p>POLYPROPYLENE SIDING. A shaped material, made principally from polypropylene homopolymer, or copolymer, that in some cases contains fillers or reinforcements, that is used to clad exterior walls or buildings.</p>	<p>IRC—TABLE R703.3(1) installation requirements, 703.14 certification requirements, 703.14.1.1 installation requirements, 703.14.2 fire separation requirements IBC—1404.12 certification requirements, 1404.12.2 fire separation requirements, 1405.18 installation requirements</p>
<p>INSULATED SIDING. A type of continuous insulation, with manufacturer-installed insulating material as an integral part of the cladding product, having a minimum R-value of R-2.</p>	<p>Insulated Siding—IRC/IECC—N1101.10.1 (R303.1.1)—R-value labeling requirements, N1101.10.4.1 (R303.1.4.1) R-value testing requirements, N1102.1.3 (R402.1.3)—use with prescriptive energy code compliance</p>
<p>INSULATED VINYL SIDING. A vinyl cladding product, with manufacturer-installed foam plastic insulating material as an integral part of the cladding product, having a thermal resistance of not less than R-2.</p>	<p>Insulated Vinyl Siding—TABLE R703.3(1) installation requirement, 703.11.2 installation requirement over foam sheathing, 703.13 certification requirements, 703.13.1 installation requirements</p>

Characteristics of Vinyl Siding

Fire safety:

- Vinyl siding is composed mainly of polyvinyl chloride, more commonly known as vinyl or PVC. Due to its chlorine base, vinyl siding does not ignite quickly and is inherently flame-retardant.
- PVC won't ignite, even from another flame, until it reaches about 730°F (387°C) and won't self-ignite until about 850°F (454°C). Those ignition temperatures are significantly higher than common framing lumber, which ignites from a flame at 500°F (260°C) and self-ignites at 770°F (410°C).
- Vinyl siding will not independently sustain combustion in air with a normal concentration of oxygen (about 21 percent)—so it extinguishes more easily.
- Vinyl siding and fiber cement are both specified as cladding options in several UL fire-rated assemblies, which means vinyl siding is accepted for use when fire-rated assemblies are required. In fact, in Table 722.6.2 (3) of the *International Building Code*, vinyl siding is specified as a type of cladding that can be used as part of a prescriptive fire-rated assembly approach, because vinyl siding does not contribute to the growth of the fire.
- Vinyl siding does not exhibit sustained flaming when tested in accordance with NFPA 268 Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source.

Environmental impact:

- Throughout the processes of manufacturing, transportation, installation, service life and waste management, vinyl siding scores well on tough environmental measures—hands down better than brick or fiber cement—according to data collected from published studies, manufacturers, and in a large part from Building for Environmental and Economic Sustainability (BEES). BEES was developed by the National Institute of Standards and Technology (NIST) as a way to compare building products from a life cycle perspective.
- Leading green building certification programs award points for the performance that vinyl siding delivers. In fact, vinyl siding has the potential to earn more points than other exterior cladding options. Vinyl siding also satisfies requirements listed in the *International Green Construction Code* and the California Green Construction Code. In addition, insulated siding may contribute points for building energy efficiency and create a better thermal building envelope.
- Vinyl siding also can support certification through the LEED for Homes and LEED for New Construction Rating Systems from the United States Green Building Council (USGBC).

Fastener Penetration Depth Clarified

Wind pressures that can potentially occur in the hurricane-prone regions of the country can challenge the ability of fasteners to hold cladding on the wall. For vinyl siding, a 0.120-inch shank roofing nail long enough to penetrate building framing by $\frac{3}{4}$ inch has long been specified, and this is used during wind load testing of vinyl siding in the VSI Product Certification Program under ASTM D3679.

Previously, it could be assumed the fastener would penetrate through approximately a half inch of wood sheathing on its way to the framing, giving a total of about 1¼-inch penetration through wood. The friction produced by both the sheathing and framing penetration contributes to the ability of the fastener to resist withdrawal during high wind conditions.

When non-wood sheathings are used, it can't be assumed penetration through the sheathing contributes the same degree of withdrawal resistance. Thus, new provisions have been added to the 2015 IRC stipulating the total fastener penetration into framing, furring sheathing or other "nailable substrate" must be 1¼ inches for vinyl siding. A definition of "nailable substrate" has been added—basically wood or equivalent material and fasteners having equivalent withdrawal

resistance.

New provisions also have been added concerning siding attachment to sheathing alone, without penetration into framing. When supported by manufacturer's instructions and a test report, siding can be attached to sheathing of specified thickness using specified fasteners. Where not supported by instructions or a report, a generic table of fastener types, sizes and spacings has been added.

All together, these new provisions increase the clarity and precision of the fasteners needed to provide secure attachment of all types of siding, and provide a solid basis for application to new options and varied construction types. **bsj**

Matt Dobson is Vice President, Code and Regulatory, for the Vinyl Siding Institute, where he works to ensure vinyl and other polymeric siding are able to fairly compete as the claddings of choice. His specific responsibilities include representing the industry on national code, green and energy issues. He has served as a member of the ICC's Code Development Committee for the International Existing Building Code and International Building Code, and as a Consensus Committee Member for the development of the National Green Building Standard.