Finished Product Testing of Fire Retardant Hardwood Plywood Panels in the ASTM E84

It is commonly misinterpreted that laminating a veneer to a substrate that meets the requirements of ASTM E84 class A Flame Spread Index (25 or less) will not affect the Flame Spread Index of the finished product. While some provisions for exemption do exist, this misinterpretation may lead to liability exposure for manufacturers marketing the final panel product as meeting Class A.

Written requirements in the standards and codes do not unanimously agree on language - creating the potential for disagreement, liability, and/or lawsuits. Currently, many codes allow for an exemption from testing for these types of products based on the surface laminate thickness. The description of the exemption varies in the building codes and, inherently, the interpretation of the language can be misleading.

The International Code Council (ICC) Model Building Codes: (International Fire Code (IFC) 2012; International Residential Code (IRC) 2012; International Building Code (IBC) 2012: state that an exemption is allowed for "Materials having a thickness less than 0.036 inch (0.9mm) applied directly to the surface of walls and ceilings."
The NFPA 101 in its latest changes has omitted the exemption. The NFPA 101 is an occupancy based code and relates mostly to assembly halls, educational, day care, and health care facilities. Ultimately the state or local jurisdiction has the final say in the matter.

HPVA Laboratories has tested a number of manufactured fire retardant hardwood plywood products intended to meet Class A with these components:

1. The panel face made up of a surface layer (hardwood veneer, high pressure laminate, stone, foil, metal, etc.) with a finish coating;
2. The panel substrate as an ASTM E84 rated Class A wood composite MDF or Particleboard, and;
3. The panel backer made of a wood veneer.

Manufacturers of fire retardant hardwood plywood commonly interpret the language as stating the face veneer and/ or surface treatment is the material that is being applied directly to the wall (the panel substrate). Since most veneers and finishes are thinner than 0.036inches (0.9mm), they believe testing the finished hardwood plywood panel product would not be required. Alternatively, some manufacturers and many code officials require testing on the complete finished product to ensure it meets the Class A Flame Spread requirement.

Based on the common model building code language, it is assumed that the panel face does not contribute to the flame spread index. In our experience, test results do not often agree with this assumption. Contrary to the statement that, "A surface material that is less than 1/28" (0.0357") thick does not contribute to the flame spread", a number of factors can play a significant role in achieving Class A in the finished hardwood plywood panel. It has been our experience, many times over, that the bond between the face and substrate play the most significant role in the flame spread index. Also, the densities of the surface veneer and application rate of the topcoat have major contributing factors to meeting or failing the Class A flame spread rating. In addition, the **Architectural Woodwork Standard** states: the flame spread rating varies for different species applied to treated substrates.

Codes and Standards are continually changing and we are seeing increasing inquires for tests of these products. ASTM has a mounting practice for wood products tested in the E84, **ASTM E2579 Standard Practice for Specimen Preparation and Mounting of Wood Products to Assess Surface Burning Characteristics**. This standard has recently been changed and will require testing of the finished product, including the combination of the facing, panel product, and adhesive used. It will state
"8.6.1 If the factory-produced laminated product includes a facing or wood veneer applied over a wood substrate, the specimens shall comply with 8.6.1.1 as well as with 8.6.1.2.
8.6.1.1 The specimens shall consist of the finished product, namely the combination of the facing, panel product or wood veneer, the adhesive used and the specific wood substrate that will be used. Mount the specimens on the ledges of the Test Method E84 furnace without using additional means of support.
8.6.1.2 The adhesive used to attach the facing, panel product, or wood veneer, to the wood substrate shall be that specified by the manufacturer and applied in accordance with manufacturer's application instructions.
8.7 Wood veneers or facing intended to be applied on site over a wood substrate. If the laminated product is not factory-produced but the wood veneer of facing is to be applied on-site over a wood substrate, the specimens shall comply with the requirements of Practice E2404. "

With more and more movement from code bodies and standards we think it's important to be on the forefront of these changes and share this information with you. In order to avoid exposure and liability, the HPVA and HPVA Laboratories suggest that any panel being sold as Class A, or subsequently being treated to be sold as Class A should have recent test report with data to confirm compliance. Reliance on the exemption may be sufficient for code compliance at this time in some cases, but be aware of the exemption language and how it is to be applied.

If you have any questions or concerns if your product needs to be tested please contact Tom Wilson at HPVA. (703) 435-2900 ex 111, twilson@hpva.org