

Itemized below are several notable developments in emerging fire retardant technology, specifically Intumescent Fire Retardant Coatings (IFRC), which warrant evaluation and review by the insurance industry:

ASTM E84-04, Extended 30 minute test

On September 30, 2005, No-Burn Plus was subjected to the ASTM E84-04 Standard test method for Surface Burning Characteristics of Building Materials, a method for determining the comparative surface burning behavior of building materials extended to a total of 30 minutes. The test was performed by an accredited lab, Intertek Testing Services NA, Inc., based in Elmendorf, Texas. The test method is also published under the designations of: ANSI 2.5; NFPA 255; UBC 8-1 (42-1); and UL 723.

The extended 30 minute tunnel test achieves impressive performance results in both Flame Spread and Smoke Development.

Specific test results include:

Flame Spread Index = 5
Smoke Developed Index = 25
Maximum Flame Front = 9.8899

The test results qualify IFRC treated wood for Class 1, fire resistance rating as defined by ICC and NFPA. The aforementioned jurisdictional authorities recognize building materials as eligible for Class 1 as those which achieve a Flame Spread Index under 25. The No-Burn Plus treated specimen achieved a Flame Spread Index of 5.

ASTM E-1623 ICAL Test

Published July 28, 2005, the Western Fire Center in Kelso, Washington released the results of No-Burn treated specimens over various substrates in accordance with the protocols of ASTM E-1623 ICAL radiant panel fire test standard. The report indicates that "the results of those tests have demonstrated that No-Burn Plus can be used as a method of producing significantly improved resistance to fire growth and spread to the various elements of a building".

Using the Component Additive Method contained in the International Building Code, No-Burn Plus can be applied to standard gypsum wallboard to achieve the equivalent fire resistive rating of Type "X" core wallboard. As an example, ½ inch regular wallboard with a two coat thickness of No-Burn Plus would be equivalent to at least the ½ inch Type "X" wallboard. Similarly, 5/8 inch regular wall board with No-Burn Plus having a dry mil thickness of 35 mils would be equivalent to at least the 5/8 inch Type "X" wallboard.

Based upon the radiant panel testing protocols, the data can be applied with the Component Additive Method to achieve a one hour fire-rated wall assembly, and a one hour fire-rated floor/roof ceiling assembly.

An additional application would be the garage-dwelling unit separation where the building code requires materials as required for a one hour fire-rated assembly be installed on the garage side of the separation. Currently, for a wall, that would be a single layer of 5/8 inch Type "X" gypsum wallboard. This degree of separation could be accomplished, based on test results, using 1/2 inch regular wallboard covered by No-Burn Plus. The same would be true of the horizontal separation.

The conclusion drawn by the Western Fire Center in Kelso, Washington is "based on the above analysis, the alternative fire-rated wall assemblies proposed in Section 2 of this report should be found to be at least equivalent to code prescribed fire-rated assemblies permitted to be used in building construction".

ENGINEERED WOOD

Engineered wood includes a range of derivative wood products which are manufactured by binding together wood strands, fibers or veneers with adhesives to form composite materials. Due to economic influences including a decreasing supply of mature lumber and building industry demands, use of these products will inevitably expand. In a news release posted 1:56 pm EST February 7, 2006 on the ChannelCincinnati.com website, News 5 published a news report, with associated video, entitled "New Home Wood Can Be Worse in Fires" and "Newer Homes Use Wood That's Stronger, Cheaper – and More Flammable". The news report states that the problem of engineered/manufactured wood is that the structure of new homes burns more quickly and thoroughly than older homes, making it more dangerous for firefighters and homeowners. Quoting a spokesman of the Cincinnati Fire Department, "These are wood chips that have been glued together, using glue and resins which are flammable". The news release indicates that, while less expensive and stronger than solid wood, manufactured wood burns faster. The TV channel performed a simulated experiment with I-joists/beams made of both types of wood, putting weight on the beams and setting them on fire. After 29 minutes, under less-than-perfect fire conditions, the manufactured wood I-beam was burned through, while the solid wood beam was charred, but intact. Inside an enclosed home, the fire would be expected to burn hotter and at a more accelerated rate. This phenomenon has raised legitimate concern in the firefighting communities.

Recent research studies suggest that traditional pressure/impregnation fire retardant treatments for conventional wood have been unsuccessful with engineered wood. In a study published January, 2004 by Dr. Winandy and Dr. White (among others), of the US Forest Service Lab, entitled "Physical and Mechanical Properties of Fire, Decay, and Termite Resistance of Treated Oriented Strand Board (OSB), traditional fire retardant chemicals found in FRTW were used to attempt to decrease the combustibility of OSB. The report indicates that the OSB was treated with "traditional" fire retardant chemicals used in FRTW. The conclusion drawn from the testing of traditional fire retardant technology on OSB, an engineered wood product: "The estimates for flame spread index in ASTM E 84 suggest that none of the treated specimens will obtain the flame spread index of less than 25 required for the most restrictive classification (Class 1) in US Building Codes".

Although not confirmed by accredited, scientific testing, it appears that engineered wood is resistant to impregnation/pressure fire retardant treatment due to the inherent resins and glues, density of engineered wood resulting from compression, and lack of porosity typical to natural wood.

Recognizing that traditional treatments of natural wood are unsuccessful with engineered wood, the most obvious and viable alternative would be a topical fire retardant coating such as IFRC, which has, as confirmed by accredited testing, to be equivalent and superior to FRTW in flame spread, smoke development, and maximum frame front.

IFRC products are also non-toxic and non-carcinogenic. These characteristics are not associated with FRTW. Therefore, although engineered wood products use the resource of wood efficiently and may promote natural-resource conservation, the required adhesives are toxic and themselves a pollution concern so that engineered wood products cannot, in the balance, be considered "environmentally friendly".

SPRINKLER FAILURE

It is estimated that, due to lack of requisite maintenance and proper inspection procedures, sprinkler system failure rates are estimated to be one in six. To exacerbate a disturbing system failure rate, reliability of the most critical system element - the sprinkler head, is now suspect.

In a news release by USA Today entitled "Defective Sprinklers Spur Fire Officials to Push for Backups", fire officials, including the President of the National Association of State Fire Marshals, questions the Code "trade-off" process in sprinklered properties.

The USA Today news release, posted 2/20/06, indicates that beginning in the 1970s, State and Local Codes gave property owners who installed sprinklers more and more leeway to scale back on other safeguards such as smoke alarms and fire resistant construction materials. These Code related tradeoffs, which permit less fire resistant building materials and extended travel distances to exits, are now being questioned following a series of four sprinkler recalls that have identified 45 million defective sprinkler heads in the past seven years alone. This figure is equal to about one in every 10 sprinklers installed nationwide since 1991. There have been four sprinkler head recalls since 1998 alone. Of the four recalls, the largest is a recall of 35 million sprinkler heads now being replaced by Tyco Fire and Building Products. More recalls are expected. The Consumer Products Safety Commission continues to investigate other sprinkler models according to the Commission's head of compliance. The sheer volume of potentially defective sprinkler heads is particularly disturbing when considering that they may be installed in buildings with occupancies including theaters, dormitories, nursing homes, auditoriums, apartment buildings, etc. The risk of catastrophic casualties and property damage cannot be understated.

The article further indicates that fire marshals are bringing their concerns to two organizations that write the model codes used by most State and Local Governments: the International Code Council and the National Fire Protection Association.

There is growing sentiment within the firefighting and Code communities to encourage the mandate of more fire resistant building materials.