

A Passive Solution to Fire Protection

Fire can be tragic in any residential structure, the potential consequences in a multi-family townhouse or multi-story apartment building are particularly serious. Any reasonable measure that prevents the spread of fire from one unit to another is welcomed by owners, managers, designers, fire officials, and residents.

Building codes have long recognized this hazard and require construction classified as "noncombustible" for certain structural components of multi-family dwellings. For some of these applications, several alternatives are acceptable. A popular choice is fire-retardant-treated wood (FRTW). It meets code requirements, and also offers design flexibility for architects, simple construction for contractors, and no-maintenance protection for property managers and building owners.

What is FRTW? People unfamiliar with FRTW are surprised to hear that wood can be used like noncombustible materials for fire protection. After all, wood has been used as fuel since man first discovered fire. But FRTW is as different from untreated wood as pig-iron is from modern structural steel. Wood's modern marvel is pressure-impregnated with fire-retardant chemicals formulated specifically for this purpose. These aqueous solutions are nontoxic and driven deep into the wood at an industrial treating plant; the finished product is readily available and sold through lumber and building material dealers.

Should a fire start from an outside fuel source and spread to the treated wood, the impregnated chemicals react with combustible gases and tars generated by the burning wood. The tars are converted to a tenaciously adhered carbon char which forms on the surface and insulates the wood underneath, slowing the rate at which fire spreads across the surface of the wood. The combustible gases are rendered nonflammable for the most part due to dilution with harmless carbon dioxide and water vapor that are released in the reaction. This happens automatically, driven by the heat of the fire, and requires no maintenance painting, batteries, or plumbing; it is true passive protection.

FRTW is not new. It was introduced in the 1890s when the U.S. Navy used it on battleships, and it thrived during World War II when metals were being consumed by the war efforts. The massive hangars built by the Navy to house their patrol blimps are an excellent example of how FRTW was utilized to meet critical building needs during that time. Today's FRTW, however, has properties which make it far superior to historical types.

To qualify as "fire-retardant-treated wood," it is tested by UL for fire performance and must meet building and fire code requirements. The most important requirement is a UL Fire Classified label indicating a reduced fire-hazard or Flame Spread. Pressure-impregnated FRTW has a Flame Spread rating of 25 or less in a 30 minute test. Most species of untreated wood have Flame Spread ratings in excess of 100 and are only tested for 10 minutes.

Building and fire codes permit the use of FRTW as a substitute for many applications where noncombustible materials are required. This includes exterior walls, trusses, interior partitions, warehouse shelving and construction scaffolding. In multi-family dwellings such as townhomes, the most common use is for roof construction. One of the principal ways a fire can pass between dwelling units is via the roof that links them. To minimize this possibility, architects have two principal options. They can design common walls that pass through the roof as parapets, thus isolating units from one

another. While effective, this method results in a roof that can be unattractive, expensive and a maintenance concern.

Most architects, builders and owners prefer the second option: an uninterrupted roof surface that uses FRT plywood on four feet of each side of common walls. This choice is equally effective, yet less costly, less likely to be accompanied by roof leaks, and cleaner-looking with its visually appealing, uninterrupted continuous roof line. As a result, many multi-family dwellings are built with roofs built at least partially with FRT plywood sheathing.

Sometimes FRTW is specified for reasons other than code requirements. It is frequently used where fire service is not readily available (e.g. wilderness lodges and vacation homes in the wildland-urban interface), where valuable items are kept (art museums, race track stables), where sprinklers cannot be easily installed or may freeze (ventilated attics), where life safety cannot be compromised (school, hospitals) or anywhere people want the peace of mind of an extra measure of safety. In many of these instances, the use of FRTW may also reduce insurance premiums.

Fire-retardant treated wood offers economical fire protection on all surfaces of lumber and throughout the thickness of plywood. It allows for attractive designs, requires only common construction skills, needs no maintenance, and utilizes a renewable resource. FRTW is a practical choice for new construction, remodeling, and re-roofing projects.

FRTW is ideal for use:

1. Where other materials would permit a fire to spread without restriction from an ignition source.
2. In areas of construction where there is inadequate water supply or fire protection.
3. For scaffolding during construction or repairs of expensive equipment or multi-story buildings.
4. In areas where sprinkler systems cannot be readily installed, such as framing under raised platforms or areas enclosed under roofs and framing for all types of remodeling work.
5. In schools where a versatile and economical construction system is desirable, but life safety cannot be compromised.

Some examples:

1. Studs and wall plates for interior non-bearing walls and partitions and exterior bearing walls where noncombustible construction is required (see codes for specific details).
2. Roof systems including sheathing, rafters, and metal plate connected wood trusses.
3. Wood structural members in fertilizer and chemical plants where highly corrosive conditions would require continuing maintenance of protective coatings on metal systems.
4. Buildings in wilderness areas such as camps or lodges, which may be at a high fire risk because they are not inhabited during certain seasons or are in areas of inadequate water supply or fire protection services.
5. Exterior architectural applications such as siding and trim.

Every brand of FRTW is different. Here are three tips for specifying a product you can depend on:

- Choose a brand with a history of problem-free performance, at least a 30-year track record.

- Check the warranty on the brand. Is it a solid guarantee backed by a stable company? Does it cover labor or just materials? Is it full coverage or prorated payment?
- Look for a brand that is readily available with national sales and technical support.

Hoover Treated Wood Products, the fire-retardant-treated wood industry leader, has been producing fire-retardant-treated lumber and plywood since 1955. Hoover's widely recognized brands, PyroGuard™ and ExteriorFireX™ are produced in its eleven industrial treating plants and are readily available through a nationwide network of stocking lumber dealers.