FIRE-RETARDANT-TREATED WOOD AND THE MINNESOTA BUILDING CODE

Minnesota Department of Labor and Industry

Background

Building codes establish construction methods and materials to safeguard public safety and property from fire and other hazards. One of the main considerations for building safety is the degree to which buildings will burn. Therefore, buildings constructed of noncombustible or fire-resistive materials are allowed to be built larger and taller than buildings constructed of combustible materials.

Under the building code, buildings are classified into five Types: I, II, III, IV and V with Type I being the most fire-resistive and Type V the least. Each Type is then further subdivided based on the level of fire-resistance. Types I and II are required to be noncombustible, meaning all primary building materials are noncombustible. Types IV and V allow for the use of combustible building materials. Type III construction is a combination of both combustible and noncombustible materials. The exterior walls are required to be of either noncombustible materials or fire-retardant-treated wood (FRTW) while other building elements are allowed to be combustible.

FRTW was not allowed within exterior walls of Type III construction until Minnesota adopted the *2000 International Building Code* in 2003. This provided a cost-effective way to construct bigger and taller buildings without the expense of traditional masonry or concrete exterior walls normally associated with Type III.

Questions and answers about fire-retardant-treated wood (FRTW)

Q: What is FRTW?

A: FRTW is wood impregnated with chemicals during manufacture that, when tested, has a flame spread index of 25 or less and no evidence of significant progressive combustion when the test is continued for an additional 20 minutes. In short, FRTW does not support combustion and its burning rate is limited when flame is applied. However, FRTW is still considered combustible.

Q: What are the advantages of using FRTW?

A: The greatest advantage is in the construction of mid-height multi-story buildings such as apartment buildings built of Type III construction. These buildings can now be designed with an increased floor area, height and four stories instead of three. FRTW is also permitted in Type I and II construction, often used in highrise buildings. This allows the more economical option of using FRTW in certain locations permitted in Section 603 of the building code.

Q: Why did the code expand the use of FRTW?

A: Testing has shown that FRTW is no less dangerous, and in many cases performs better, than unprotected steel because it maintains structural integrity longer under fire conditions.

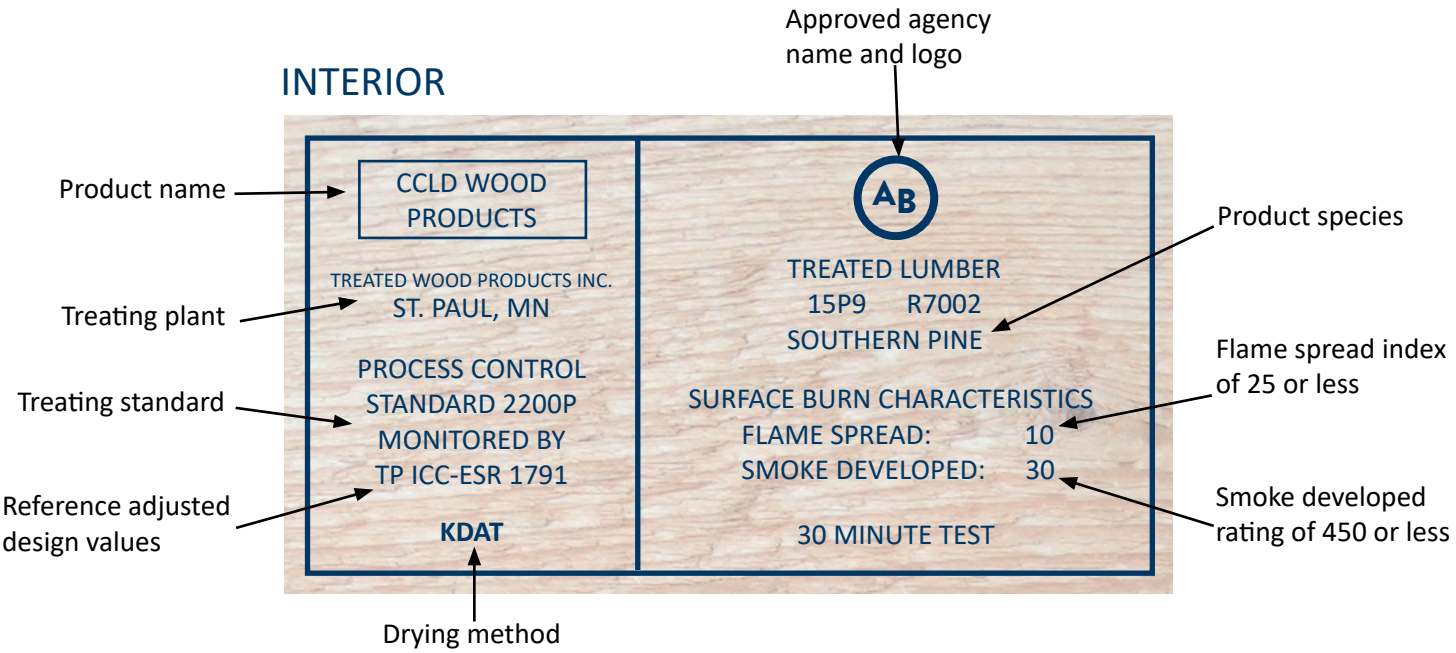
Q: How does the treatment process affect the wood?

A: Depending on the species, type of product (stud, joist, plywood, beam), and its application (wall, floor, roof), the strength originally associated with the wood is reduced when treated with a fire retardant. Therefore, the FRTW manufacturer is required to provide strength adjustments based on the intended use of the wood. This reduction in strength must be factored in to the structural design of the building.

Q: How does a building code official know if a FRTW product is approved for use in Minnesota?

A: Under Building Code Section 2303.2.4, FRTW and wood structural panels must include a label that shows:

- the identification mark of an approved agency;
- identification of the treating manufacturer;
- the name of the fire-retardant treatment;
- the species of wood treated;
- flame spread and smoke-developed index;
- method of drying after treatment;
- conformance with appropriate standards including strength adjustments; and
- for FRTW exposed to weather, damp or wet locations it must be identified as "Exterior."



Q: What should the building code official do to ensure compliance with FRTW requirements?

A: Wall sections and construction details shown on plans must be reviewed to verify that FRTW is identified. The specification manual must state that FRTW will be appropriately treated and labeled according to the requirements of Section 2303.2. Structural plans must be reviewed to determine that correct design values have been used for FRTW in accordance with Section 2303.2.5. When inspecting buildings containing FRTW, the inspector should verify that it is used where shown on the approved plans, that each piece of FRTW is individually labeled and that the label contains all the information required in Section 2303.2.4.

Q: Are there other considerations with the use of FRTW?

A: The designer, contractor and building code official should be aware how FRTW is to be protected during storage and construction. Unless labeled for exterior use, FRTW should not be subject to excessive or prolonged exposure to moisture as this can affect the performance of the fire-retardant treatment. FRTW should be covered while stored on the job site and once in place, the weather-resistive barrier should be installed over the exterior walls as soon as possible.

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

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