

## TECHNICAL NOTE

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# COMBUSTIBLE MATERIALS IN NONCOMBUSTIBLE BUILDINGS

Building and life safety codes allow combustible materials in the construction and interior finish of all buildings. Depending on the use, height, and area of the building they can be limited. Before combustibles can be used, they must be tested to show they will not adversely affect the fire performance of a building. **PyroGuard**<sup>TM</sup> and **ExteriorFireX**<sup>TM</sup> fire-retardant-treated wood (FRTW) is permitted in noncombustible construction.

**Pressure-impregnating** wood with a fire-retardant treatment changes its combustibility. Codes require testing FRTW for 30 minutes in the ASTM E84 tunnel; limiting the flame spread to no more than 25, the flame front to no more than 10 1/2 feet, and exhibiting no significant progressive combustion. Because of FRTW's reaction to fire after treatment, codes permit it for structural applications in walls, partitions, platforms, and roof structures of all buildings. In noncombustible buildings, untreated wood is limited to nonstructural applications; such as, interior finish, backing, and blocking.

Buildings are classified as to types of construction. The materials used and the fire protection determine the classification: Type IA, IB; Type IIA, IIB; Type IIIA, IIIB; Type IV; and Type VA and VB. Type IA has the most passive fire protection, Type IIB, IIIB and VB the least. The following outlines where fire-retardant-treated wood may be used in combustible and noncombustible structures:

### ROOF STRUCTURES

SECTION	IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB
	Noncombustible				Mixed		Combustible		
International Building Code: 603.1, 1.3	Yes <sub>1</sub>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NFPA 5000 7.2.3.2.9.2	Yes <sub>1</sub>	Yes <sub>1</sub>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NFPA 220 4.2.3.2.9.2	Yes <sub>1</sub>	Yes <sub>1</sub>	Yes	Yes	Yes	Yes	Yes	Yes	Yes

<sup>1</sup> permitted two stories or less, unless 20 feet or more from floor to roof structure.

## WALLS

WALLS	IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB
	Noncombustible				Mixed		Combustible		
International Building Code: 602.3; 602.4, 1; 603.1, 1.2									
Bearing	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Nonbearing	Yes <sub>1</sub>	Yes <sub>1</sub>	Yes <sub>1</sub>	Yes <sub>1</sub>	Yes	Yes	Yes	Yes	Yes
NFPA 5000 7.2.3.2.12.1; 7.2.4.2.1									
Bearing	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Nonbearing	Yes <sub>1</sub>	Yes <sub>1</sub>	Yes <sub>1</sub>	Yes <sub>1</sub>	Yes	Yes	Yes	Yes	Yes
NFPA 220 4.3.2.12.1; 4.4.2.1									
Bearing	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Nonbearing	Yes <sub>1</sub>	Yes <sub>1</sub>	Yes <sub>1</sub>	Yes <sub>1</sub>	Yes	Yes	Yes	Yes	Yes

<sup>1</sup> permitted when the fire separation distance is 30 feet or more.

**Partitions:** All types of construction permit FRTW for partitions. Partitions in Type I and II must have a fire resistance of 2 hours or less.

**Interior finish:** The speed at which the flame moves across the combustible material and how much smoke is generated are primary considerations in all types of construction. Flame spread restrictions differ by occupancy and location within the structure. Care must be taken to ensure combustible materials meet the applicable requirements. With its Class A flame spread rating, fire-retardant-treated wood (FRTW) meets all code requirements for flame spread and smoke developed in any building.

**Concealed Spaces:** NFPA 13, Installation of Sprinkler Systems, requires sprinkler protection in combustible concealed spaces. Some examples of concealed spaces are: attics, platforms, and floors. The use of FRTW for the combustible material in the concealed space permits exemption of the concealed space from the sprinkler requirement.

**Combustible Materials on Exterior Side of Exterior Walls:** The codes provide for the use of FRTW on the exterior side of exterior walls up to 60 feet above grade plane. There is no minimum fire separation distance.

**Insurance Savings:** Insurance companies consider FRTW to be slow burning and therefore typically charge lower premiums when it is used.

**Summary:** In order to use combustibles in Type I and Type II construction consideration must be given to the specific building code provisions. FRTW is recognized by all building codes for interior trim and structural uses.