

LIMITED COMBUSTIBLE CODES and STANDARDS

The control of fire in structures is one of the elements of building codes and standards. As a result, codes and standards take a close look at combustibility of materials. From a codes point of view, what constitutes a noncombustible material? What is a “limited-combustible material?” Is fire-retardant-treated wood a limited-combustible material? To understand the difference between the three materials a look at the provisions in the codes is necessary.

Currently, the International Building Code, 2015 edition (IBC) in Section 703.5 has two criteria for acceptance of a material as noncombustible.

1. Any material meeting the requirements in ASTM E136 - *"Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C."*
2. Materials with a noncombustible core (as tested with ASTM E136) with a facing not more than 1/8 inch thick. The facing must have a flame spread index of 50 or less when tested with ASTM E84 - *"Standard Test Method for Surface Burning Characteristics of Building Materials"* or UL723 - *"Standard for Test for Surface Burning Characteristics of Building Materials."*

The National Fire Protection Association (NFPA) also uses the ASTM E136 test for determining the combustibility of a material. If a material cannot pass E136 it may be recognized as a limited-combustible material. A limited-combustible material:

- meets Part 2 in the IBC and has a potential heat of 3500 Btu/lb or less as classified in NFPA 259 - *"Standard Test Method for Potential Heat of Building Materials"*, or;
- is a material that has a flame spread of 25 or less regardless of how it is cut when tested with ASTM E84 or UL723 and shows no evidence of progressive combustion and has a potential heat of 3500 Btu/lb or less.

The potential heat of fire-retardant-treated wood (FRTW) is greater than 3500 Btu/lb and as such, it is not considered a limited-combustible material.

Other than the Btu content, there is a difference between the testing of the two materials in the ASTM E84 test. Fire-retardant-treated wood must be tested for 30 minutes as opposed to 10 minutes for a limited-combustible material. FRTW must show no evidence of significant progressive combustion at the end of the 30 minutes as opposed to the 10 minutes for a limited-combustible material. As a result pressure impregnated fire-retardant-treated wood is a combustible material used in lieu of a noncombustible or limited-combustible material.

The 2006, 2009, 2012, 2015, and 2018 editions of the Life Safety Code permit use of a “limited-combustible material” in many instances where a noncombustible material is required. The same is true for “fire-retardant-treated wood” in roofs and walls. See Code Reference Technical Notes (www.frtw.com) for information on allowable applications for FRTW.