

## TECHNICAL NOTE

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# FLAME SPREAD CLASSES, ROOF COVERINGS CLASSES, AND HOURLY FIRE RESISTANCE RATINGS

Flame spread index, roofing classes and hourly ratings are confusing terms and they sometimes get misused. Flame Spread Index is based on the ASTM E84/UL723 "Test for Surface Burning Characteristics of Building Materials"; Roof Covering Class is based on ASTM E108/UL790, "Test for Fire Performance of Roofing Materials"; Hourly resistance ratings are determined for assemblies based on ASTM E119 "Fire Tests of Building Materials."

### **FLAME SPREAD INDEX**

ASTM E84/UL723 classifies products by the flame spread index. The index is a numerical reference and is determined by the response of the material during a ten minute test.

Class A or I :	Flame spread Index 25 or less
Class B or II :	Flame spread Index 26 to 75
Class C or III :	Flame spread Index 76 to 20

The International Building Code and International Residential Code (IBC / IRC) requires that material described as Fire-Retardant-Treated Wood (FRTW) must have a flame spread index of 25 or less in the 10-minute ASTM E84/UL723 test, and when the test is continued for an additional 20 minutes and there shall be no evidence of significant progressive combustion, and the flame front shall not progress more than 10.5 feet from the centerline of the burner.

**These additional requirements distinguish FRTW from surface coatings and any other building material.**

### **CLASS A-B-C ROOF COVERINGS**

There is no correlation between Class A flame spread and Class A roof Coverings. ASTM E108/UL790 roof covering test is a pass-fail test under which a product either passes the criteria as a Class A, B, or C roof covering system or it doesn't. The highest fire classification for a roof covering is Class A. Note that a Class C roof covering is considered to be classified for fire rating, while a Class C building material is not. Non-classified roof systems have no fire rating.

## **HOURLY FIRE RESISTANCE RATINGS**

Hourly ratings are a function of the assembly being used (wall, floor/ceiling, door etc.) and generally require use of a noncombustible material (gypsum, masonry).

ASTM E119 "Fire Tests of Building Construction Materials" is the test used to determine the hourly resistance rating of an assembly. It exposes an assembly to heat and flame on one side and tests for heat transmission, burn-through, and the ability to withstand a hose stream from a fire hose.

The extended 30 minute requirements of the building code for FRTW has no relation to a 30-minute or other hourly rating, which must be determined by ASTM E119. Fire-Retardant-Treated Wood cannot be substituted for type-X gypsum in a rated assembly and achieve the same hourly rating. FRTW's advantage over untreated wood and other combustible materials is the fact that it doesn't ignite or contribute to the spread of flame. Building codes often allow this substitution which means wood can be used in noncombustible construction.