



### **The Function of Fire Retardant Protection:**

The function of fire retardant coatings is to protect the surfaces to which they are applied against the ravages of fire. When applied to combustible surfaces, fire retardant coatings sharply limit the flame spread, fuel contributed and smoke development that would otherwise occur if surfaces underwent fire exposure without a protective coating. To provide a means of determining the surface burning characteristics of combustible materials, the American Society of Testing Materials developed a test standard to evaluate the fire hazard characteristics of typical construction products. The test standard, known today as ASTM E-84, is described as the "Standard Test Method for Surface Burning Characteristics of Building Materials."

### **ASTM E-84**

This ASTM E-84 test procedure evaluates the hazard characteristics of a finished surface exposed to fire --- i.e., spread, fuel contributed and smoke developed. To evaluate the fire hazard classification of a particular finished surface, it is compared in performance to two established bench marks --- cement asbestos board is typically regarded as totally incombustible and red oak regarded as a typical combustible surface.

Cement asbestos board is calibrated as having the following characteristics: flame spread – 0, fuel contributed --- 0, smoke developed – 0.

Red oak is calibrated as having the following characteristics: flame spread –100, fuel contributed –100, smoke developed –100.

In the ASTM E-84 test, the finished surface of the assembly to be evaluated is placed at the top of a tunnel, 25 feet long, 17-1/2 feet wide and 12 feet high.

A gas flame is introduced into this tunnel so that the flame impinges on the surface about 5-1/2 feet from one end of the tunnel. In a 10 minute fire exposure, wherein temperatures in the tunnel rise to approximately 1200 degrees F., the flame spread across the specimen is measured along the remaining 19-1/2 foot distance in the tunnel. The test is of 10 minutes duration.

The flame spread classification is measured by an engineering formula after determination of the number of feet of flame spread travel within 10 minute test duration.

The fuel contributed is measured by the supplementary BTU build-up in the tunnel over and above the BTU input by the fire.

The smoke density is measured by a photo-electric cell located in vent pipe exhaust.

The fire hazard classification of the treated surface is then listed in accordance with the results obtained. These interior finish classifications generally carry an alphabetical listing which pertains to the degree of “incombustibility” or protection offered by the finished surfaces.

Most building and insurance codes rate construction in accordance with the following classifications:

**Fire Hazard Classification**

<b>Class</b>	<b>Flame Spread</b>	<b>Smoke Development</b>
Class A	0-25	0-50
Class B	26-75	50-125
Class C	76-200	126-200

It is important to consider coverage rates as well as flame spread rating when evaluating fire retardant coatings. A low flame spread rating only indicates part of a coatings’ thermal efficiency. The most thermally efficient fire retardant coatings are those with both high coverage rates and the low flame spread ratings. Albi fire retardant coatings have been extensively tested under the ASTM E-84 test method and are listed by Underwriters’ Laboratories, Inc. as Class A Fire Retardant Coatings.



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