



ASTM E84 Testing Related General Information

Scope & Usage

This fire-test-response standard for the comparative surface burning behavior of building materials is applicable to exposed surfaces such as walls and ceilings.

This standard is **used to measure** and describe the **response of materials, products, or assemblies to heat and flame under controlled conditions**, but does not by itself incorporate all factors required for fire-hazard or fire-risk assessment of the materials, products, or assemblies under actual fire conditions

This test method is intended to **provide only comparative measurements of surface flame spread and smoke density measurements** with that of select grade red oak and fiber-cement board surfaces under the specific fire exposure conditions described herein.



Steiner Tunnel (Test Apparatus) Outside and Inside View

Test Specimen's Requirements

The size of the test specimen shall be:

Width	: between 20 and 24 in. (508 and 610 mm)
Length	: 24 ft + 12 in. — 6 in. (7.32-m)
Thickness	: maximum 4 in. (101 mm)

Sample can be submitted as:

- Single Piece
- Multiple cut pieces of defined width adding up to desired length
- Roll that can be mounted on specified material or system

Sample conditioning:

The test specimen shall be conditioned to a constant weight at a temperature of $73.4 \pm 5^\circ\text{F}$ ($23 \pm 2.8^\circ\text{C}$) and at a relative humidity of $50 \pm 5\%$.



**THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS**

Examples of some of the samples:



Pic # 1



Pic # 2



Pic # 3



Pic # 4



Pic # 5

*Pictures 1, 2 & 3
represent different
materials
Pictures 4 Shows flexible
material
Picture 5 Shows multiple
pieces used to achieve*

What you get (Test Results)

The test result is reported as two parameters along with test data, graphs and pictures.

The flame spread index (FSI)

The Flame Spread Index calculated is a relative indication of the flammability of the test material with respect to a red oak standard. Both the distance of flame spread and the time-rate of flame spread are considered as part of calculating a flame spread index. Simply put a reported flame spread index of 25 indicates that a material has approximately 25 percent of the standard material's flame spread characteristics.

Smoke Developed Index

The "smoke developed index" is calculated similarly. It is a number or classification indicating a comparative measure derived from smoke obscuration data collected during the test for surface burning characteristics.

Flame Spread Index and Smoke Developed Index results from an ASTM E84 test are often used by code officials, regulatory agencies and authorities having jurisdiction in order to approve/accept interior finish materials for various applications. An example of classification is given in the International Building Code 2012, Section 803.1.1 interior wall and ceiling finish materials. Interior wall and ceiling finish materials shall be classified in accordance with ASTM E84 or UL 723-10th Ed. 2008. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indexes.

Classification

	Flame Spread Index	Smoke Developed Index
Class A	0-25	0-450
Class B	26-75	0-450
Class C	76-200	0-450

The above Classification applies only for Interior Wall and Ceiling Finish Materials, and may not be applicable for materials used in other areas of a building as other requirements in regards to results of flame spread and smoke developed index may apply.

For more information please reach out to us at fire@bell-wright.com