TECHNICAL BULLETIN

Fire Ratings & Paint

What are Flame Spread Ratings?

The ICC International Building Code (for new buildings) and International Fire Code (for existing buildings) limit the allowable flame spread and smoke development characteristics of building materials used for interior finishing, based on location and occupancy type. Materials are grouped in the following classes by Flame Spread Index and Smoke Developed Index when tested in accordance with ASTM Method E 84, “Standard Test Method for Surface Burning Characteristics of Building Materials”:

Class	Flame Spread Index	Smoke Developed Index
A	0 – 25	0 – 450
B	26 – 75	0 – 450
C	76 – 100	0 – 450

Exceptions include exposed portions of structural members that meet other requirements, and materials having a thickness less than 0.036 inch (36 mils) applied directly to the surface of walls or ceilings. Standard interior paints and coatings are typically applied to produce dry films of 1 to 2 mils per coat.

Consequently, paints and coatings are not rated for flame spread or smoke development in themselves, i.e., independent of the substrates to which they are applied.

When applied to substrate materials that have been tested and classified, interior paints and coatings have been found to have no effect on the Flame Spread Index or Smoke Developed Index of rated materials.* For example: Gypsum drywall is rated Class A, whether unpainted or painted.

What are Flame Spread and Smoke Developed Indexes?

Flame Spread Index

This is determined by the distance that a flame travels along a test substrate in a limited time, compared to inorganic reinforced cement board, which is rated 0, and select grade red oak flooring, which is assigned an arbitrary rating of 100.

Smoke Developed Index

This is determined by the concentration of smoke that a test substrate emits as it burns, again compared to inorganic reinforced cement board, which is rated 0, and select grade red oak flooring, which is assigned an arbitrary rating of 100.

*Flammability of Paint Study, National Paint & Coatings Association, Inc., 1974, Project 3-3774-141, Southwest Research Institute. This study examined the flame spread and smoke development characteristics of various combustible and non-combustible building materials, both uncoated and coated with a wide variety of conventional interior paints and coatings. The research report concluded that the study “provides substantial evidence that conventional paints and coatings do not increase the flame spread of either non-flammable or flammable substrates upon which they are applied. It also indicates that any fuel contribution or smoke density increase is insignificant when compared with the contribution of the substrate itself.”

What is an Ignition-Resistant Material?

As defined in California Building Code Chapter 7A (SFM) Materials and Construction Methods for Exterior Wildfire Exposure, an Ignition-Resistant Material is a "type of building material that resists ignition or sustained flaming combustion sufficiently so as to reduce losses from wildland-urban interface conflagrations under worst-case weather and fuel conditions with wildfire exposure of burning embers and small flames, as prescribed in Section 703A and SFM Standard 12-7A-5, Ignition-Resistant Material."

Paint and coatings, however, are explicitly excluded from this category of materials:

“703A.5.3 Surface treatment protection. The use of paints, coatings, stains or other surface treatments are not an approved method of protection as required in this chapter.”