FLAME SPREAD RATING

Flame spread rating is one of the key fire rating classifications used in residential and commercial construction to assist building code officials, architects, builders, and inspectors in assessing the relative fire hazard of different building materials.

ASTM E84 (commonly referred to as “E84”) and UL 723 are fire test standards used to evaluate the surface burning characteristics of building materials. Although developed by different organizations, many building codes reference ASTM E84 and UL 723 interchangeably, as the two standards are considered equivalent in terms of test methodology and resulting performance classifications. Both standards use the same test procedure, known as the Steiner Tunnel Test (Figure 1), in which a material sample is exposed to a controlled flame and measurements are taken of the rate and extent of flame spread across the surface, as well as the amount of smoke generated during the ten-minute test period. Test results are reported as a Flame Spread Index (FSI) and a Smoke Developed Index (SDI).

Figure 1

The International Building Code® (IBC) and the National Fire Protection Association (NFPA) 101® Life Safety Code® both require that interior wall and ceiling finishes be classified in accordance with ASTM E84 or UL 723. These interior finish materials are further grouped into three classes based on their flame spread and smoke-developed indices (see table on the following page).

NFPA Class	IBC Class	Flame Spread Index	Smoke Development Index
A	A	0–25	0–450
B	B	26–75	0–450
C	C	76–200	0–450

In some applications, the use of Class A-rated paint materials over non-combustible wall and ceiling surfaces, such as fire-rated gypsum board, concrete, masonry, stucco, and similar substrates, is required. However, it is not practical for paint manufacturers to test every coating over every possible base material that may be used in occupied spaces. In response to this issue, the National Paint & Coatings Association (NPCA), now known as the American Coatings Association (ACA), conducted a comprehensive study in 1974 (Project 3-3774-141). This study, which involved several paint manufacturers, was carried out at the Southwest Research Institute, Department of Fire Technology, in San Antonio, Texas. The research evaluated the flame spread and smoke development characteristics of a wide range of combustible and non-combustible building materials, both uncoated and coated with various conventional interior paints and coatings. The study concluded that it "***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.***"

Based on the findings of this study, paints and coatings manufactured by Vista Paint Corporation may be assigned a Class A rating when applied over substrates that are themselves classified as Class A. In our experience, the data presented in the study is acceptable to the Fire Marshal and other authorities having jurisdiction as evidence of suitability for applications where a Class A rating is required. It should be clearly understood, however, that while conventional architectural paints and coatings do not significantly alter the fire rating of the substrates to which they are applied, they do not upgrade a Class C substrate, such as wood, to a Class A classification. When such an upgrade is required, specially formulated intumescent (fire-retardant) coatings must be used.