

## Section D-3 Flame-Spread Ratings and Smoke Developed Classifications

### D-3.1. Interior Finish Materials

#### D-3.1.1. Scope of Information

Tables D-3.1.1.-A and D-3.1.1.-B show flame-spread ratings and smoke developed classifications for combinations of some common interior finish materials. The values are based on all the evidence available at present. Many materials have not been included because of lack of test evidence or because of inability to classify or describe the material in generic terms for the purpose of assigning ratings.

**Table D-3.1.1.-A**  
**Assigned Flame-Spread Ratings and Smoke Developed Classifications for Combinations of Wall and Ceiling Finish Materials and Surface Coatings<sup>(1)</sup>**

Materials	Applicable Material Standard	Minimum Thickness, mm	Surface Coating	
			Unfinished	Paint or Varnish not more than 1.3 mm Thick, Cellulosic Wallpaper not more than One Layer <sup>(2)(3)</sup>
Brick, concrete, tile	None	None	0/0	25/50
Steel, copper, aluminum	None	0.33		
Gypsum plaster	CSA A82.22-M	None		
Gypsum board	CAN/CSA-A82.27-M	9.5	25/50	25/50
	ASTM C 1396/C 1396M			
Lumber	None	16	150/300	150/300
Douglas Fir plywood <sup>(4)</sup>	CSA O121	11	150/100	150/300
Poplar plywood <sup>(4)</sup>	CSA O153			
Plywood with Spruce face veneer <sup>(4)</sup>	CSA O151			
Douglas Fir plywood <sup>(4)</sup>	CSA O121	6	150/100	150/100
Fibreboard low density	CAN/ULC-S706	11	X/100	150/100
Hardboard				
Type 1	CAN/CGSB-11.3-M	9	150/X	<sup>(5)</sup>
Standard		6	150/300	150/300
Particleboard	ANSI A208.1	12.7	150/300	<sup>(5)</sup>
Waferboard, OSB	CSA O437.0	–	<sup>(5)</sup>	<sup>(5)</sup>
	CSA O325	–	<sup>(5)</sup>	<sup>(5)</sup>

**Notes to Table D-3.1.1.-A:**

- (1) See Sentence D-1.1.1.(5) for standards used to assign flame-spread ratings and smoke developed classifications.
- (2) Flame-spread ratings and smoke developed classifications for paints and varnish are not applicable to shellac and lacquer.
- (3) Flame-spread ratings and smoke developed classifications for paints apply only to alkyd and latex paints.
- (4) The flame-spread ratings and smoke developed classifications shown are for those plywoods without a cellulose resin overlay.
- (5) Insufficient test information available.

**Table D-3.1.1.-B**  
**Flame-Spread Ratings and Smoke-Developed Classifications for Combinations of**  
**Common Floor Finish Materials and Surface Coatings<sup>(1)</sup>**

Materials	Applicable Standard	FSR/SDC <sup>(2)</sup>
Hardwood or softwood flooring either unfinished or finished with a spar or urethane varnish coating	None	300/300
Wool carpet (woven), pile weight not less than 1120 g/m <sup>2</sup> , applied with or without felt underlay <sup>(3)</sup>	CAN/CGSB-4.129	300/300
Nylon carpet, pile weight not less than 610 g/m <sup>2</sup> and not more than 800 g/m <sup>2</sup> , applied with or without felt underlay <sup>(3)</sup>	CAN/CGSB-4.129	300/500
Nylon carpet, pile weight not less than 610 g/m <sup>2</sup> and not more than 1355 g/m <sup>2</sup> , glued down to concrete	CAN/CGSB-4.129	300/500
Wool/nylon blend carpet (woven) with not more than 20% nylon and pile weight not less than 1120 g/m <sup>2</sup>	CAN/CGSB-4.129	300/500
Nylon/wool blend carpet (woven) with not more than 50% wool, pile weight not less than 610 g/m <sup>2</sup> and not more than 800 g/m <sup>2</sup>	CAN/CGSB-4.129	300/500
Polypropylene carpet, pile weight not less than 500 g/m <sup>2</sup> and not more than 1200 g/m <sup>2</sup> , glued down to concrete	CAN/CGSB-4.129	300/500

**Notes to Table D-3.1.1.-B:**

- (1) Tested on the floor of the tunnel in conformance with provisions of CAN/ULC-S102.2, "Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies."
- (2) Flame-Spread Rating/Smoke Developed Classification.
- (3) Type 1 or 2 underlay as described in CGSB 4-GP-36M, "Carpet Underlay, Fiber Type."

### **D-3.1.2. Ratings**

The ratings shown in Tables D-3.1.1.-A and D-3.1.1.-B are arranged in groups corresponding to the provisions of this Code. The ratings apply to materials falling within the general categories indicated.

### **D-3.1.3. Table Entries**

In Tables D-3.1.1.-A and D-3.1.1.-B, the first number of each entry relates to flame spread and the second number to smoke developed limit. For example:

25/50 represents a flame-spread rating of 0 to 25 and a smoke developed classification of 0 to 50,

150/300 represents a flame-spread rating of 75 to 150 and a smoke developed classification of 100 to 300, and

X/X applied to walls and ceilings means a flame-spread rating over 150 and a smoke developed classification over 300.

### **D-3.1.4. Effect of Surface Coatings**

Thin surface coatings can modify flame-spread characteristics either upward or downward. Table D-3.1.1.-A includes a number of thin coatings that increase the flame-spread rating of the base material, so that these may be considered where more precise control over flame-spread hazard is desired.

### **D-3.1.5. Proprietary Materials**

- 1) Information on flame-spread rating of proprietary materials and fire-retardant treatments that cannot be described in sufficient detail to ensure reproducibility is available through the listing and labeling services of Underwriters' Laboratories of Canada, Intertek Testing Services NA Ltd., or other recognized testing laboratory.
- 2) A summary of flame-spread test results published prior to 1965 has been prepared by NRC (see Item (1) in Subsection D-2.1.).

### **D-3.1.6. Limitations and Conditions**

- 1) The propagation of flame along a surface in the standard test involves some finite depth of the material or materials behind the surface, and this involvement extends to the depth to which temperature variations are to be found during the course of the test; for many commonly used lining materials, such as wood, the depth involved is about 25 mm.
- 2) For all the combustible materials described in Table D-3.1.1.-A, a minimum dimension is shown, and this represents the thickness of the test samples on which the rating has been based; when used in greater thicknesses than that shown, these materials may have a slightly lower flame-spread rating, and thinner specimens may have higher flame-spread ratings.

3) No rating has been included for foamed plastic materials because it is not possible at this time to identify these products with sufficient accuracy on a generic basis. Materials of this type that melt when exposed to the test flame generally show an increase in flame-spread rating as the thickness of the test specimen increases.

**D-3.1.7. Referenced Standards**

In Tables D-3.1.1.-A and D-3.1.1.-B, the standards applicable to the materials described are noted because the ratings depend on conformance with these specifications.