



CAPITAL TESTING AND CERTIFICATION SERVICES

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TEST REPORT

Test Method: CAN/ULC-S102:2018-REV1, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

Rendered To:

Product Description:

Report Number:

Original Issue Date:

Test Date:

Pages:



TL-224

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I. SCOPE

This test report contains the results from a specimen tested in accordance with CAN/ULC-S102, *Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies*. The CAN/ULC-S102 test method is intended to provide 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. The results of CAN/ULC-S102 testing are commonly used by building code officials and regulatory agencies to determine whether interior finish materials are suitable for their intended application.

II. TEST SPECIMENS

Test specimens should be representative of the material which the test is intended to examine. All test specimens should be at least 50 mm wider than the interior width of the tunnel (500 ± 20 mm) and 7315 ± 15 mm in length. The test specimen can be provided in a continuous, unbroken length or multiple sections that will be butted together. Prior to testing, the specimens are conditioned to a constant mass in an environment that is held at 23 ± 3 °C (73.4 ± 5.4 °F) and $50 \pm 5\%$ relative humidity.

TEST SPECIMEN INFORMATION	
Description	
Samples Selected By	
Date Received	
Conditioning Time	
Specimen Size (in.)	
Continuous / Sectioned	
Number of Sections	
Avg. Total Weight (lbs.)	
Average Thickness (in.)	
Color	
Exposed Surface	
Mounting Method	

* Information provided by the Client



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III. PROCEDURE

The tunnel is preheated to 85 ± 5 °C (185 ± 9 °F) as measure by a thermocouple embedded in the backwall of the furnace at 7090 mm (23.3 ft) from the centerline of the burner. The tunnel is then cooled to 40 ± 3 °C (104 ± 5.4 °F) as measured by a thermocouple embedded in the backwall of the furnace at 4000 mm (13.1 ft) downstream of the centerline of the burner.

After the tunnel has cooled to required temperature range, the tunnel lid is lifted, and the test specimen is placed on the ledges of the tunnel. The specimen is mounted in a ceiling orientation with the side that will be exposed to the flame facing downward. A 6 mm (0.25 in.) fiber-cement board is placed on the backside of the specimens to protect the tunnel lid during testing.

Once the sample has been loaded into the test chamber, the lid is lowered, and a 1.2 ± 0.025 m/s (236.2 ± 4.9 ft/min) airflow is established. The test specimen is preheated for approximately 2 minutes prior to applying the 90 kW burner. The burner is positioned at the front end of the tunnel. It has two ports that point upward toward the face of the specimen. After the 2-minute preheat, the burner is ignited, and it remains on for the duration of the 10-minute test. The flame is tracked by an observer, referred to as the Reader, as it progresses down the length of the tunnel. Smoke density is measured with the use of the photometer system on the exhaust duct. Temperature data is recorded throughout the test by a thermocouple probe that is 7000 mm (23 ft) from the centerline of the burner and approximately 25mm (1 in.) below the sample surface.

IV. TEST RESULTS

In CAN/ULC-S102 testing, test results for individual burns are reported as Flame Spread Value (FSV) and Smoke Developed Value (SDV). The average indices, that are derived from a minimum of three individual burns, are reported as Flame Spread Rating (FSR) and Smoke Developed Classification (SDC).

The Flame Spread Value is derived by plotting the flame spread distance versus time. Only progressive flame spread is plotted. The total area (A_T) under the flame spread distance-time plot is determined by ignoring any flame front recession. The calculation of FSV is described below:

When $A_T \leq 29.7$ m•min: $FSV = 1.85 * A_T$

When $A_T > 29.7$ m•min: $FSV = 1640 / (59.4 - A_T)$



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The Smoke Developed Value is derived by plotting the photoelectric cell readings versus time. The area under the curve for the tested material is then divided by the area under the curve for select-grade red oak flooring. The resulting value is then multiplied by 100.

The Flame Spread Rating is determined by averaging a minimum of three individual Flame Spread Values and rounding that average to the nearest multiple of 5. The Smoke Developed Classification is determined by averaging a minimum of three individual Smoke Developed Values and rounding that average to the nearest multiple of 5.

FLAME SPREAD RATING (FSR)	SMOKE DEVELOPED CLASSIFICATION (SDC)

Test Start Date	
Test End Date	
Equipment Operator	
Flame Spread Reader	

	Burn #1	Burn #2	Burn #3
Ignition Time (s)			
Flame Spread Value (FSV)			
Smoke Developed Value (SDV)			
Maximum Temperature (°C)			
Maximum Temperature (°F)			
Time to Maximum Temperature (min)			
Maximum Flame Spread Distance (m)			
Maximum Flame Spread Distance (ft)			
Time to Maximum FS Distance (min)			



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V. OBSERVATIONS

During Test

After Test

Note: Reported observation distances are relative to the entire length of the test specimen.

VI. REMARKS



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VII. GRAPHS AND INDIVIDUAL BURN DATA

Test Room Temperature (°F):

Test Room Humidity (%RH):

Note: Distances on this page are reported in meters.



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Test Room Temperature (°F):

Test Room Humidity (%RH):

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Test Room Temperature (°F):

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VIII. DISCUSSION

CAN/ULC-S102 Standard Language and Disclaimers

The following language was taken directly from the CAN/ULC-S102 standard. It has been included for information purposes.

Smoke Developed Value (SDV) and Flame Spread Value (FSV) are recorded in this test. However, there is not necessarily a relationship between these two measurements. – CAN/ULC-S102:2018-REV1, Section 1.7

This method defines the relative surface burning characteristics under specified test conditions. Although the procedure is applicable to materials, products and assemblies used in building construction for development of comparative surface spread of flame data, test results may not reflect the relative surface burning characteristics of tested materials under all building fire conditions. – CAN/ULC-S102:2018-REV1, Section 3.1

The “fire hazard” of any material in the light of present knowledge cannot be evaluated on the basis of any one test. A body of tests, each measuring one or more characteristics of a material, product, or assembly, may be needed for full assessment. These assessments are intended as aids to those who have the responsibility for determining acceptable levels of potential hazard. The overall fire hazard of a material as it is to be used can only be determined by an analysis of its behavior under several test conditions in addition to further analysis which includes consideration of building construction, occupancy, location and fire protection features. – CAN/ULC-S102:2018-REV1, Section 3.2

IX. AUTHORIZED SIGNATURES

Christopher Kaiser
Laboratory Technician II - Fire

Date

Reviewed and Approved By:

Chris Palumbo
Sr. Manager of Product Testing

Date



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X. REVISION HISTORY

Revision Number	Date	Summary
0		Original Report Issued