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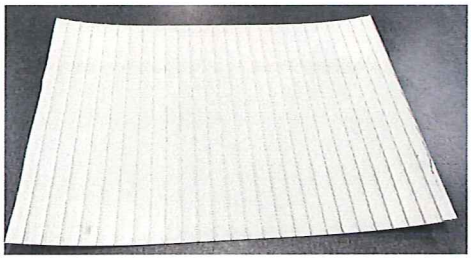
EVALUATION OF 'EZ LINER PVC MATERIAL' FOR SURFACE BURNING CHARACTERISTICS IN ACCORDANCE WITH ASTM E84

A Report to:	**Vision Extrusions** 201 Zenway Boulevard Woodbridge, Ontario L6H 3H9
Attention:	Tony Vella
Telephone:	+1 (905) 265-9970
Email:	tvella@Vexgroup.com
Proposal No.:	19-006-078187 Ref. Original: 19-006-589172Rv2
Report No.:	19-06-P0060 3 Pages, 1 Appendix
Date:	May 1, 2019

1.0 INTRODUCTION

At the request of *Vision Extrusions*, Exova was retained to measure a sample of EZ liner PVC material for surface burning characteristics, in accordance with ASTM E84. The proposed testing outline can be found in Exova Proposal No.: 19-006-078187, referencing the original Exova Proposal No.: 19-006-589172Rv2.

Upon receipt, the sample was assigned the following Exova Sample Number:

Client Sample Description	Exova Sample No.
VE 1004 White 122  Outer walls of the panel were extracted and internal vertical channels removed for fire testing.	19-06-P0060

2.0 PROCEDURE

Testing was performed in accordance with the following test method:

Test Description	Test Method
Standard Test Method for Surface Burning Characteristics of Building Materials	ASTM E84

3.0 RESULTS

A summary of the test results is presented in Table 1, more detailed test results can be found in Appendix A.

Table 1 – Summary of Surface Burning Results
Applicable Standard: ASTM E84

Exova Sample No. 19-06-P060

Time to Maximum Flame Front (s)	Flame Spread Index (FSI)	Smoke Developed Index (SDI)	Comments
84	15	350	See Appendix A for details.

4.0 CONCLUSION

The material submitted by Vision Extrusions, labeled as "*VE 1004 White 122* ", was tested for surface burning characteristics as described in this report. The flame spread index was 15 and the smoke developed index was 350.

5.0 REVISION HISTORY

Date:	Revision:	Comments:
2019-05-01	Original Document	N/A

Reported by:

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Appendix A

Surface Burning Characteristics Detailed Test Results and Procedure for "**VE 1004 White 122".**

Applicable Standard: ASTM E84

(4 Pages)

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ASTM E 84 Surface Burning Characteristics of "VE 1004 White 122" Liner Panel Profile

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Submitted by:	Exova Fire Testing
Report No.	19-002-208(A) 4 Pages
Date:	April 30, 2019

ACCREDITATION To ISO/IEC 17025 for a defined Scope of Testing by the International Accreditation Service

SPECIFICATIONS OF ORDER

Determine the Flame Spread and Smoke Developed Indices based upon a single test conducted in accordance with ASTM E 84-18b, as per Exova Building Science Project No. 19-06-P0060, Exova Work Order No. 542842, and Exova Quotation No. 19-006-589172RV2.

SAMPLE IDENTIFICATION (Exova sample identification number 19-06-P0060)

Flexible, plastic material, described as, "Liner Panel Profile", and identified as:
"VE 1004 White 122"

TEST PROCEDURE

The method, designated as ASTM E 84-18b "*Standard Method of Test for Surface Burning Characteristics of Building Materials*", is designed to determine the relative surface burning characteristics of materials under specific test conditions, where the material under test is mounted so that it forms the ceiling of a horizontal fire tunnel. A specified airflow is introduced through the tunnel and a specified flame is applied to one end. Observations are then made regarding the rate of flame spread along the specimen. Results are expressed in terms of Flame Spread Index (FSI) and Smoke Developed Index (SDI). There is no established relationship between those two values.

Although the procedure is applicable to materials, products and assemblies used in building construction for development of comparative surface spread of flame data, the test results may not reflect the relative surface burning characteristics of tested materials under all building fire conditions.

SAMPLE PREPARATION

The liner material consisted of two flat surfaces and a hollow core, approximately 0.375 (10 mm) in total thickness. The core is reinforced by longitudinal, structural supports spaced approximately 0.75 inches (19 mm) apart, that form internal channels in the panel. By request, the material was sectioned (cut) through the thickness so as to create a test specimen comprised of only a single, flexible sheet layer, with no core or channels. The test specimen consisted of a total of three prepared sections of material, each approximately 0.039 inches (1 mm) in thickness by 19 inches (483 mm) in width by 96 inches (2438 mm) in length. The sections were butted together to create the requisite specimen length. Prior to testing, the specimen was conditioned to constant weight at a temperature of 73 ± 5°F (23 ± 3°C) and a relative humidity of 50 ± 5%. During, the specimen was supported across its width by 0.25 inch (6 mm) steel rods spaced nomainlly at 24 inch (610 mm) intervals.

The testing was performed on: 2019-04-30

SUMMARY OF TEST PROCEDURE

The tunnel is preheated to 150 ± 5°F (66 ± 2.8°C), as measured by the floor-embedded thermocouple located 23.25 feet (7087 mm) downstream of the burner ports, and is allowed to cool to 105 ± 5°F (40.5 ± 2.8°C), as measured by the floor-embedded thermocouple located 13 feet (3962 mm) from the burners. The tunnel lid is then raised and the test sample is placed along the ledges of the tunnel so as to form a continuous ceiling 24 feet (7315 mm) long, approximately 12 inches (305 mm) above the floor. Three 8 foot (2438 mm) sections of 0.25 inch (6 mm) cement board are then placed on the back side of the sample and the lid is then lowered into place.

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SUMMARY OF TEST PROCEDURE (continued)

Upon ignition of the gas burners, the flame spread distance is observed and recorded every second. Flame spread distance versus time is plotted. Calculations ignore all flame front recessions and Flame Spread Index (FSI) is determined by calculating the total area under the curve for the test sample. If the area under the curve (A) is less than or equal to 97.5 min·ft, then FSI = 0.515·A; if greater, FSI = 4900/(195-A). FSI is then rounded to the nearest multiple of 5.
Smoke Developed Index (SDI) is determined by dividing the total area under the obscuration curve by that of red oak, and multiplying by 100. SDI is then rounded to the nearest multiple of 5 if less than 200. SDI values over 200 are rounded to the nearest multiple of 50.

TEST RESULTS

SAMPLE: **"VE 1004 White 122"**

Approx. Time to Ignition (s)	Maximum Flame Front Distance	Time to Maximum Flame Front (s)	Flame Spread Index (FSI)	Smoke Developed Index (SDI)
22	(ft.): 3.6 (m): 1.10	84	**15**	**350**

Observations of Burning Characteristics

The specimen ignited approximately 22 seconds after exposure to the test flame. Sagging and partial collapse was observed. Material that fell to the floor of the apparatus also ignited (at approximately 74 seconds).

Interpretation of Test Results

Industry documents such as the International Building Code (IBC) or NFPA 101 Life Safety Code refer to ASTM E 84 (UL 723, NFPA 255) test results using the following material classification categories:

	Flame-Spread Index (FSI)	Smoke Development Index (SDI)
Class 1 or Class A	0 - 25	450 Maximum
Class 2 or Class B	26 - 75	450 Maximum
Class 3 or Class C	76 - 200	450 Maximum

Results Classification (if applicable):	**Class 1 or Class A**

Francis Williams,
Technician.

Ian Smith,
Technical Manager.

Note: This report and service are covered under Exova Canada Inc. Standard Terms and Conditions of Contract which may be found on the Exova website (www.exova.com), or by calling 1-866-263-9268.

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ASTM E 84-18b Test Charts

Sample: "VE 1004 White 122"

Chart 1. FLAME SPREAD

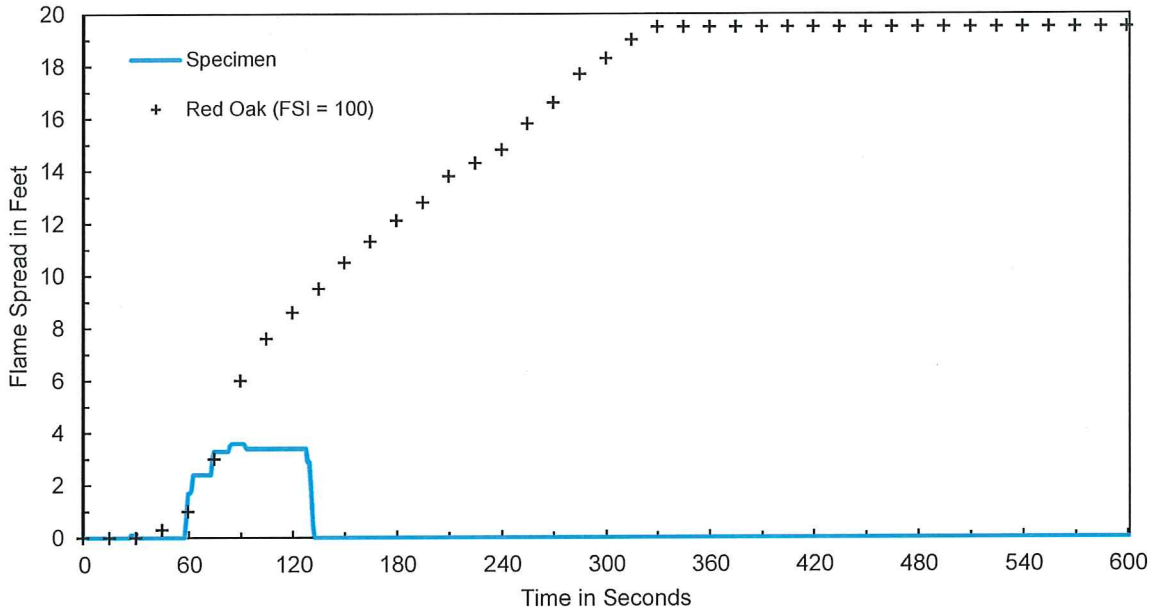
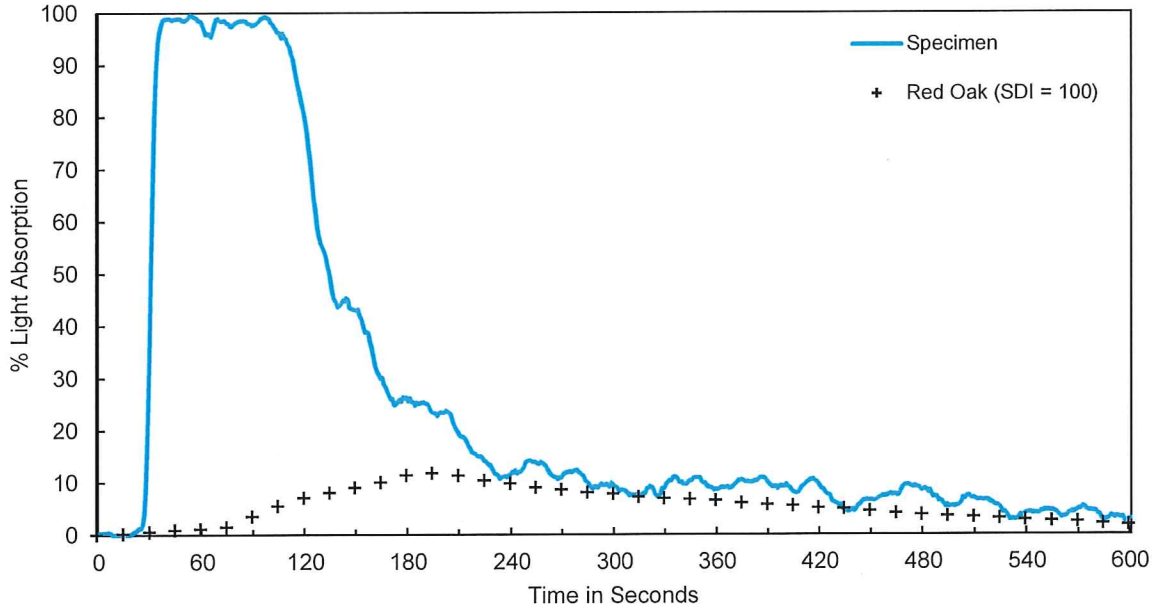


Chart 2. SMOKE DEVELOPED



Calculated Flame Spread (CFS)	Rounded Flame Spread Index (**FSI**)	Calculated Smoke Developed (CSD)	Rounded Smoke Developed Index (**SDI**)	Maximum 23' Air Temperature (°F)
16.6	**15**	372.3	**350**	356