

# SOUTHWEST RESEARCH INSTITUTE®

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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION  
FIRE TECHNOLOGY DEPARTMENT  
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## NFPA 701-2004, *STANDARD METHODS OF FIRE TESTS FOR FLAME PROPAGATION OF TEXTILES AND FILMS* (TEST METHOD 2)

**MATERIAL ID:** 20' x 100' x 006-FR

### FINAL REPORT

Consisting of 3 Pages

SwRI Project No: 01.15213.04.038


**Test Date:** August 11, 2010

**Report Date:** August 25, 2010

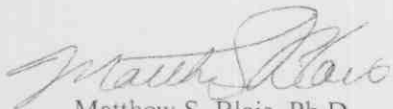
**Prepared for:**

Rodeo Plastic Bag & Film Inc.  
3328 Executive Blvd.  
Mesquite, TX 75149

**Prepared by:**

  
Christina Gomez  
Research Engineer  
Material Flammability Section

**Approved by:**

  
Matthew S. Blais, Ph.D.  
Acting Director  
Fire Technology Department

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## INTRODUCTION

This report presents the results of a specimen submitted by the Client, and tested at Southwest Research Institute's (SwRI's) Fire Technology Department, located in San Antonio, Texas. The test was conducted in accordance with the procedures outlined in NFPA 701, 2004 Edition, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films* (Test Method 2).

This method is intended for use in determining the resistance of fabrics and films to propagation of flame beyond the area exposed to the source of ignition. This method shall apply to single-layer fabric and multilayer curtain and drapery assemblies while suspended in a vertical configuration. However, where durability to cleaning or weathering is claimed, the fabric or material shall be tested for flame resistance as produced and after being subjected to the applicable cleaning or laundering procedure. The results of this test do not necessarily indicate whether the material tested will resist the propagation of flame under severe exposure or when used in a manner that differs substantially from the test conditions.

Ten individual test specimens shall be cut from a single piece of the material to be evaluated: 125 × 1200 mm (4.90 × 47.25 in.) for flat strips, and 610 × 1200 mm (24 × 47.25 in.) for folds, with the length parallel to the lengthwise direction of the material. Only specimens that cannot be folded shall be tested in the flat configuration.

Each specimen shall be conditioned in an oven at a temperature of 105 °C ± 3 °C for not less than 1 h, and no more than 3 h before testing.

Each specimen is mounted on the support hanger in the test cabinet. The burner is placed 100 mm (3.94 in.) away from the specimen with the center axis of the burner at a 25-degree angle in line with the bottom of the center of the specimen, and is maintained for a 120 s exposure time.

The afterflame time of the specimen (time of burning of the specimen after the gas flow is turned off) and the time of burning of material that falls to the bottom of the chamber shall be measured and recorded.

The requirements for acceptance of the NFPA 701 (Test Method 2) are:

1. Where fragments or residues of specimens that fall to the floor of the test chamber continue to burn for more than 2 s, the material shall be recorded as failing the test.
2. Where the char length exceeds 435 mm (17.1 in.) for flat specimens or 1050 mm (41.3 in.) for fold specimens, the material shall be recorded as failing the test.
3. Where the afterflame exceeds 2 s, the material shall be recorded as failing the test.
4. Where the specimens do not demonstrate performance in accordance with any of the conditions indicated in the above, the material shall be recorded as passing the test and shall be designated as flame resistant.

The results apply specifically to the specimens tested, in the manner tested, and not to the entire production of these or similar materials, nor to the performance when used in combination with other materials.

**This standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment, which takes into account all of the factors, which are pertinent to an assessment of the fire hazard of a particular end use.**

## NFPA 701 TEST REPORT (TEST METHOD 2)

### MATERIAL DESCRIPTION

Material ID	Description	Color	Density	Mass*	Nominal Test Dimensions*
20' × 100' × 006-FR	2 boxes sample cut to test specs 6 mil flame retardant	Clear White*	1000 g/m <sup>2</sup>	147 g	0.07 × 125 × 1200 mm

\* Measured by SwRI personnel.

Preparation: The specimens were received on August 5, 2010, and cut to size by SwRI personnel on August 11, 2010. The specimens were placed in an oven and maintained at 105 °C for 1-3 h before testing. The specimens were then removed from the conditioning chamber, secured into the test chamber, and tested.

TEST DATA - Single Sheets (10 specimens)

TEST DATE: August 11, 2010

Specimen No.	Char Length (mm)	Afterflame Time (s)	Burning on Floor (s)	Pass/Fail
1	281	None	None	Pass
2	348	None	None	Pass
3	347	None	None	Pass
4	301	None	None	Pass
5	302	None	None	Pass
6	310	None	None	Pass
7	337	None	None	Pass
8	313	None	None	Pass
9	290	None	None	Pass
10	367	None	None	Pass

Observations: Two of the ten test specimens dripped with no flame.

### CONCLUSIONS

Based on the test results and the classification criteria, the specimen identified as 20' × 100' × 006-FR **meets** the requirements established under the NFPA 701 (Test Method 2).

**POLYHEDRON LABORATORIES<sup>®</sup>, INC.**

**PLASTICS, POLYMERS and RUBBER TESTING**

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e-mail techsales@polyhedronlab.com

December 7, 2010

Rodeo Plastic Bag & Film, Inc.  
3328 Executive Blvd.  
Mesquite, TX 75149

Attn: Mr. Dustn Swehla

**Analytical Report**

**OIT by ASTM D 3895**

Sample No.

OIT (200°C) min

24" x 24" Swatch .006 mil  
620

1.43

Instrument - Perkin Elmer with data processing.



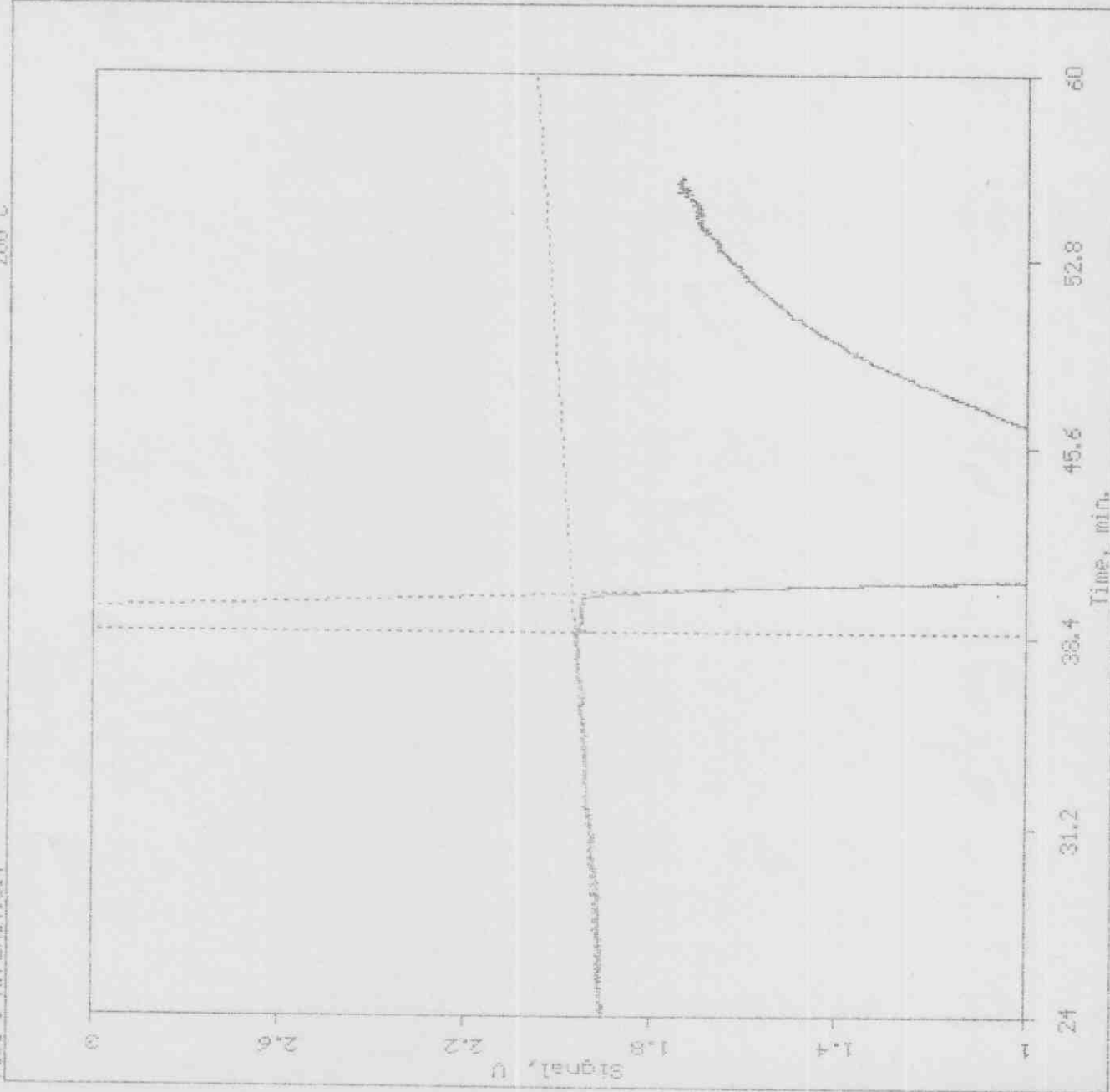
Howard Kaye, Ph.D., FAIC  
Director

HK/lk

POLYHEDRON LAB Lab #29913  
Oxidation  
Temperature:  
200 C

Sample : 0.006MTL PLASTIC  
Descr. : OIT 200  
File : ARPLAST.OIT

Oxygen  
Start time at:  
38.56 min  
Oxidation time at:  
39.98 min  
Induction time :  
1.43 min  
----- (900) -----





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ASTM E 84 - 10  
INVESTIGATION OF THE SURFACE BURNING  
CHARACTERISTICS OF A NOMINAL 0.0025-IN.  
THICK FR POLY SHEETING  
MATERIAL ID: 20' × 100' × 006 - FR

FINAL REPORT  
Consisting of 5 Pages  
SwRI® Project No.: 01.15209.01.196

Test Date: August 11, 2010  
Report Date: August 23, 2010

Prepared for:

RODEO PLASTIC BAG & FILM INC.  
3328 EXECUTIVE BLVD.  
MESQUITE, TX 75149

Prepared by:

Anthony L. Saucedo  
Group Leader  
Material Flammability Section

Approved by:

Matthew S. Blais, Ph.D.  
Acting Director  
Fire Technology Department

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## ASTM E 84 - 10 REPORT

CLIENT: RODEO PLASTIC BAG & FILM INC.  
SWRI PROJECT NO.: 01.15209.01.196  
TEST DATE: AUGUST 11, 2010  
DAILY TEST NO.: 4

### DESCRIPTION OF SPECIMEN

DATE RECEIVED:	August 5, 2010 (received ready-to-test)
MATERIAL ID:*	20' × 100' × 006 - FR
DESCRIPTION:	Flame retardant (FR) poly sheeting
THICKNESS:	0.0025 in. (nominal)
UNIT WEIGHT:	2.43 oz/yd <sup>2</sup> (nominal)
COLOR:	White (*Clear)
SPECIMEN SIZE:	One sheet, 25.5 in. wide × 288.0 in. long
CONDITIONING TIME:	2 days at 70 °F and 50% relative humidity
SUPPORT USED:*	2.0-in. hexagonal wire mesh with 0.25-in. diameter steel rods every 24.0 in.

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\* From Client's material description and/or instructions

## ASTM E 84 - 10 REPORT

CLIENT: RODEO PLASTIC BAG & FILM INC.  
SWRI PROJECT NO.: 01.15209.01.196  
TEST DATE: AUGUST 11, 2010  
DAILY TEST NO.: 4

### TEST RESULTS

FLAME SPREAD INDEX (FSI):	30
SMOKE DEVELOPED INDEX (SDI):	140

### TEST DATA

UNROUNDED FSI:	29.8
UNROUNDED SDI:	141.1
FS*TIME AREA (Ft*Min):	57.8
SMOKE AREA (%*Min):	81.8
FUEL AREA (°F*Min):	4140.2

### OBSERVATIONS DURING TEST

IGNITION TIME (Min:Sec):	0:03
MAXIMUM FLAME FRONT ADVANCE (Ft.):	5.9
TIME TO MAXIMUM ADVANCE (Min:Sec):	0:24
MAXIMUM TEMP. AT EXPOSED TC (°F):	504
TIME TO MAXIMUM TEMP. (Min:Sec):	9:57
TOTAL FUEL BURNED (Cu. Ft.):	55.0
DRIPPING (Min:Sec):	0:03
FLAMING ON FLOOR (Min:Sec):	0:03
AFTERFLAME TOP (Min:Sec):	None
AFTERFLAME FLOOR (Min:Sec):	None
SAGGING (Min:Sec):	None
DELAMINATION (Min:Sec):	None
SHRINKAGE (Min:Sec):	None
FALLOUT (Min:Sec):	0:03

### CALIBRATION DATA

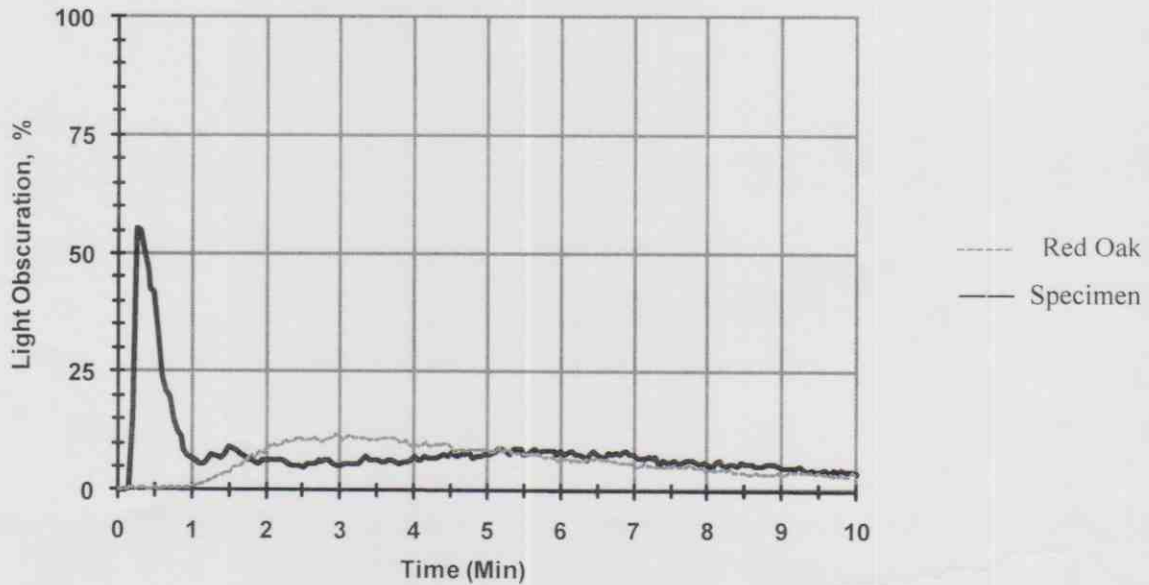
RED OAK SMOKE AREA (%*Min):	55.9
RED OAK FUEL AREA (°F*Min):	7680
GRC BOARD FUEL AREA (°F*Min):	5062



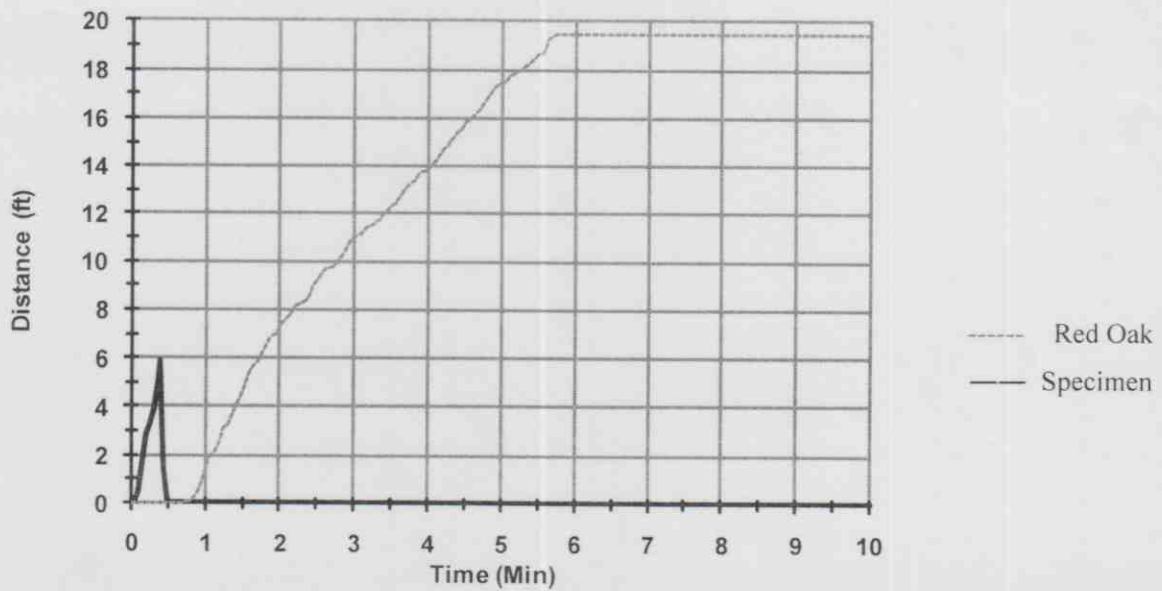
## ASTM E 84 - 10 REPORT

CLIENT: RODEO PLASTIC BAG & FILM INC.  
SWRI PROJECT NO.: 01.15209.01.196  
TEST DATE: AUGUST 11, 2010  
DAILY TEST NO.:4

### LIGHT OBSCURATION



### FLAMESPREAD



## **INTRODUCTION**

This report presents the test results for a specimen submitted by Rodeo Plastic Bag & Film Inc., located in Mesquite, TX, and tested at Southwest Research Institute's (SwRI's) Fire Technology Department, located in San Antonio, Texas. The test is conducted in accordance with the procedure outlined in ASTM E 84 - 10, *Standard Test Method for Surface Burning Characteristics of Building Materials* (NFPA 255, ANSI/UL 723 and UBC 8-1).

This test method is applicable to exposed surfaces, such as ceilings or walls, provided that the material or assembly of materials, by its own structural quality or the manner in which it is tested and intended for use, is capable of supporting itself in position or being supported during the test period. The test is conducted with the material in the ceiling position.

The purpose of this test method is to determine the relative burning behavior of the material by observing the flame spread along the specimen. Flame Spread and Smoke Developed index are reported. However, there is not necessarily a relationship between these two measurements.

**This standard should be used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions and should not be used to describe or appraise the fire-hazard or fire-risk of materials, products, or assemblies under actual fire conditions. However, results of the test may be used as elements of a fire-hazard assessment or a fire-risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard or fire risk of a particular end use.**

Test specimens are conditioned as appropriate in an atmosphere maintained between 68 and 78 °F and 45 to 55% relative humidity. Immediately prior to the test, the specimen is mounted in the furnace with the side to be tested facing the test flame. Cement board is placed on the unexposed side of the specimen to protect the furnace lid assembly. Sometimes, because of the nature of the material undergoing testing, additional support (e.g. wire, wire and rods, rods, and/or bars) is used to ensure that the specimen will remain in position during the test. The use of supporting materials on the underside of the test specimen may lower the Flame Spread Index from that which might be obtained if the specimen could be tested without such support, and the test results do not necessarily relate to indices obtained by testing materials without such support.

The flame front position and light obscuration are recorded throughout the 10-minute test and used to calculate the Flame Spread and Smoke Developed indices. The temperature at 23 ft is also recorded. The Flame Spread and Smoke Developed indices reported herein are relative to the results obtained for mineral fiber-reinforced cement board and select grade red oak (moisture content between 6 and 8%). The mineral fiber-reinforced cement board is the calibration material used to obtain 0 values for Flame Spread and Smoke; red oak decks are used to obtain 100 values for Flame Spread and Smoke.

The results apply specifically to the specimens tested, in the manner tested, and not to the entire production of these or similar materials, nor to the performance when used in combination with other materials.

Two model building codes (2009 International Building Code®, Chapter 8 *Interior Finishes*, Section 803 *Wall and Ceiling Finishes*; NFPA 5000, Chapter 10 *Interior Finish*, Section 10.3 *Interior Wall or Ceiling Finish Testing and Classification*) classify materials based on the Flame Spread and Smoke Developed indices. For reference purposes, the classification criteria are listed below:

Classification	Flame Spread Index	Smoke Developed Index
A	0 – 25	0 – 450
B	26 – 75	0 – 450
C	76 – 200	0 – 450

# Rodeo Plastic Bag & Film

3328 Executive Blvd.  
Mesquite, TX 75149

## SPECIFICATIONS FOR FLAME RETARDANT FILM

	4mil	6mil	10mil
ASTM E 84 (Burning Characteristics)			
Flame Spread Index	20	20	20
Smoke Development	90	105	120
ASTM D 882 (Tensile Strength)			
MD	1700psi	1700psi	1700psi
TD	1200psi	1200psi	1200psi
ASTM D 882 (Elongation)			
MD	225%	225%	225%
TD	260%	260%	260%
ASTM D 1709 (Dart Test)	200g	325g	500g
ASTM E 96 (WVTR)	.20p	.14p	.08p

Designed for applications requiring a self-extinguishing, flame retardant protective cover.

*\*Testing performed by Polyhedron Laboratories, Inc.*



# POLYHEDRON LABORATORIES®, INC.

PLASTICS, POLYMERS and RUBBER TESTING

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September 1, 2006

Rodeo Plastic Bag & Film, Inc.  
3328 Executive Blvd.  
Mesquite, TX 75149

## Analytical Report

### Sample - Flame Retardant (6 mil)

#### Tensile Properties by ASTM D 882:

Tensile Strength MD (psi)

2002.4 ± 84.8

1700

% Elongation MD

486.6 ± 41.4

225

Impact by ASTM D 1709 (g)

241

260

WVTR by ASTM E 96:

WVTR (g/24hr m<sup>2</sup>)

0.91 ± 0.072

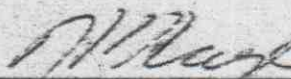
3.7

Permeance (perms)

0.117 ± 0.007

0.13

Standard Specification  
by ASTM D 4397



Howard Kaye, Ph.D., FAIC  
Director

HK/dr