


Packaging Research Centre Sdn Bhd (118297-K)

A Member of the Hong Leong Group Malaysia

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ISO/IEC 17025

 TESTING
 SAMM NO. 066

TEST REPORT

Report No.: 0299/03-PL

Issued Date: 12.8.2003

Page No.: 2 of 2

PLASTIC TESTING LABORATORY

Descriptions	No. of Specimens Tested	Unit	Test Method	Testing Date	Mean Value	Standard Deviation
Customer					Genteng Woven Products (Melayu) Sdn. Bhd.	
Conditioning					No	
Material Identity					A058/10-55 FR2 (AL/MPET)	
Testing Environment					23±2 °C, 50±2%RH	
Thickness	20	mm	ISO TM 00054	12.8.2003	0.175	0.042
30 MPa pressure applied	Test Equipment: LAM Minicaster					
Crushage	20	g/m ²	ISO 158-1981	12.8.2003	152	9.49
Test piece area used: 150cm ²	Test Equipment: Master Release P1400					
Testing Environment					23±2 °C, 50±2%RH	
Crushal Speed: 200mm/min	Gauge Length: 20mm		Test Equipment: Instron Universal Tester 4303			
(Load at Peak)						
*Tensile strength	MD	5	N/50mm	PRC TM 00001	12.8.2003	580.3
"Per 50MM Area"	TD	5				43.8
						38.4
*Elongation	MD	5	%			17.9
"Per 50MM Area"	TD	5				3.3 ^A
						2.6 ^A
Crushal Speed: 100mm/min	Gauge Length: 20mm		Test Equipment: Instron Universal Tester 4303			
*MPET Bond Strength	5	N/50mm	8-Floue	12.8.2003	1.36	0.41 ^A
"Per 50MM Area"						
Water Vapor Transmission Rate	2	g/m ² /day	ASTM F 3160-01	12.8.2003		
33.8°C, 80±5% RH	Atmosphere Being Test gas: Test Equipment: Moisture Permeation W3/20					
	Specimen 1				0.0305	0.005 ^A
	Specimen 2				0.0482	0.047 ^A
Crushal Speed: 10mm/min	Gauge Length: 20mm		Test Equipment: Instron Universal Tester 4303			
*Al Diffusion Strength			N/50mm	PRC TM 00081	12.8.2003	
"Per 50MM Area"						
Units: (mm) Time	MD	5			3.75 ^F	
	TD	5				No aluminum transferred
Units: (mm) Time	MD	5				No aluminum transferred
	TD	5				No aluminum transferred

Remarks: *It was observed that the results are inconsistent as shown in the standard deviation.

**"Per 50mm" "Per 50MM Area" in this test report are not included in the SAMM Accreditation Schedule for our laboratory.

***The result given is based on specimen #1 (0% aluminum transferred). For specimen #1-4, due to no aluminum transferred.

Tested by:

 Name: Tang Ming Hoe
 Designation: R & D Assistant

Confirmed by:

 Name: Leik Mei Mei
 Designation: R & D Manager

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TEST REPORT

Your Ref: Date: 6 February 2003
 Our Ref: 5490401792/STMTWCSY Page: 1 of 3
 CID: 68651407 Fax: 67761803

NOTE: This report is issued subject to PSB Corporation's "Terms and Conditions Governing Technical Services". The terms and conditions governing the issue of this report are set out as attached with this report.

SUBJECT: Testing of FR2 (A1/MPET) - L2 040107 A3

TESTED FOR:

Garfene Woven Products (Melaka) Sdn Bhd
 Lots 9 & 10 Ayer Keroh Industrial Estate
 71450 Melaka
 Malaysia

Att: Ms Preena Sankrasegaran

DESCRIPTION OF SAMPLE:

One piece of 1200mm x 1200mm FR2 (A1/MPET) - L2 040107 A3 was received on 12 January 2004 for testing.

TEST METHODS:

1. Initial Tear Resistance

ASTM D1004 : 1994a
 Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting

Type of test specimens : Dia C
 Length of grips separation : 25.4mm
 Crosshead speed : 5mm/min
 No. of determinations : 10 per longitudinal direction

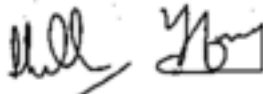
2. Tear Propagation

DIN 53561 : 1969
 Testing of Plastic Films
 Tear Propagation Test on Trapezoidal Specimens with a Slit

Type of test specimens : Figure 1
 Length of grips separation : 50mm
 Crosshead speed : 100mm/min
 No. of determinations : 5 per longitudinal direction

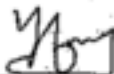


PSB TEST[®]
 Test Pieces of Steel

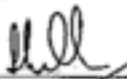


TEST RESULTS:

Characteristics	FR2 (A)/MPET - L2 040107 A3
1. Initial Tear Resistance (N/mm), average	
a) Machine Direction	323.4
b) Transverse Direction	317.4
2. Tear Propagation (N/mm), average	334.0



Kong Siow Yong
Assistant Product Manager



Christina Loh-Siew Cheam
Product Manager
Polymer Products
Testing Group

Certificate of Test

CZ32AN83548

REPORT NO.: FNS 0170C

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TESTS ON A BARKING MATERIAL IN ACCORDANCE WITH BS 476: PART 7: 1997

IDENTIFICATION OF SAMPLE:

FR2 (AOS806 - 32)

SPONSOR:

GUOLENE WOVEN PRODUCTS (Melaka) Sdn Bhd
Lot 9 & 10 Ayer Keroh Industrial Estate
75450 MELAKA MALAYSIA

DESCRIPTION OF SAMPLE:

The sponsor described the sample as a HDPE woven fabric, with aluminium foil laminated on one side using a polymer as the tie layer and MPET laminated on the other side. A bromine based fire retardant was used in the fabric. The aluminium face was the exposed face in the test.

Nominal Mass: 140 g/m²
Nominal thickness: 145 µm
Colour: Silver

A full description of the test specimen and the complete test results are detailed in the Division of Building, Construction and Engineering's report numbered FNS 0170.

TEST METHOD:

The specimens were tested in accordance with British Standard 476, Fire tests on building materials and structures, Part 7. Method for classification of the surface spread of flame of products - 1997. For the test, each specimen measured 885 mm x 270 mm and was clamped to the water-cooled frame.

RESULTS:

Specimen	Spread of Flame at 1.5 min (mm)	Final spread of flame at 10 min (mm)
1	55	55
2	55	55
3	55	55
4	60	80
5	50	50
6	55	55

CLASSIFICATION:


Class 1

The test results relate only to the behaviour of the test specimens of the product under the particular conditions of test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

DATE OF TEST:

2 October 2001

Issued on the 3rd day of October 2001 without alterations or additions.


Glenn Whitaker
Testing Officer


Gary Collins
Manager, Fire Testing and Assessment



Accreditation No. 3632

This laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.



CSIRO

Improving the Built Environment

Building, Construction and Engineering

14 Julius Avenue, Riverview Corporate Park, Dehti Road, North Ryde NSW 2113 AUSTRALIA
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555

Certificate of Test

CZ52ANP3547

REPORT NO.: FNP 0158C

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TEST FOR FIRE PROPAGATION OF MATERIALS

**SAMPLE
IDENTIFICATION:**

FR2 (AO58/06 - 32)

SPONSOR:

DUOLENE WOVEN PRODUCTS (Malaka) Sdn Bhd
Lot 6 & 10 Ayer Keroh Industrial Estate
MELAKA MALAYSIA

**DESCRIPTION
OF SAMPLE:**

The sponsor described the sample as a HDPE woven fabric, with aluminium foil laminated on one side using a polymer as the tie layer and MPET laminated on the other side. A bromine based fire retardant was used in the fabric. The aluminium face was the exposed face in the test.

Nominal Mass: 140 g/m²
Nominal thickness: 148 µm
Colour: Silver

A full description of the test specimen and the complete test results are detailed in the Division of Building, Construction and Engineering's report numbered FNP 0158.

TEST METHOD:

Using the test apparatus as described in BS 476: Part 5 - 1993, nominally 225 mm square samples of the sarking material were exposed to the heat source. Type K, 1 mm diameter, stainless steel Mineral Insulated Metal Sheathed (MIMS) thermocouples measured the rise in temperature of the exhaust gases throughout the test. For the test, three specimens were tested with a non-combustible backing board.

OBSERVATIONS:

Ignition was observed on all of the tested specimens.

RESULTS:

Index I ₁	Index I ₂	Index I ₃	FIRE PROPAGATION INDEX
2.6	1.5	0.2	4.3

The test results relate only to the behaviour of the tested specimens under the required test conditions; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

DATE OF TEST: 10 October 2001

Issued on the 11th day of October 2001 without alterations or additions.


G. Whitaker
Testing Officer


G. G. Collins
Manager, Fire Testing and Assessments



Accreditation No. 3632

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Building, Construction and Engineering
14 Julius Avenue, Riverside Corporate Park, Delhi Road, North Ryde NSW 2113 AUSTRALIA
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ASTM E84-00a

**SURFACE BURNING
CHARACTERISTICS**

FR 2 (A056/06-32)

Report No. 16317 - 109713



ABSTRACT

Test Material:	FR 2 (A06806-32)
Test Standard:	ASTM E84-00a Standard Test Method for SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS (ANSI 2.5, NFPA 255, UBC 8-1, UL 723)
Test Date:	October 11, 2001
Test Sponsor:	Guolene Woven Products
Test Results:	FLAME SPREAD INDEX = 5 SMOKE DEVELOPED INDEX = 45

The description of the test procedure and specimen evaluated, as well as the observations and results obtained, contained herein are true and accurate within the limits of sound engineering practice. These results are valid only for the specimen(s) tested and may not represent the performance of other specimens from the same or other production lots.

Omega Point Laboratories, Inc. authorizes the client named herein to reproduce this report only if reproduced in its entirety.

The test specimen identification is as provided by the client and Omega Point Laboratories accepts no responsibility for any inaccuracies therein.



Guy A. Haby
Fire Test Technologist

Date: October 15, 2001



William E. Fitch, P.E. No. 55296
Executive Vice President

Date: October 15, 2001



ASTM E84 DATASHEETS

Client: GUOLENE WOVEN PRODUCTS (MELAKA)

Date: 10/11/01

Time: 2:24 PM

Test Number: 5

Project Number: 16317-109713

Operator: CH/EH

Specimen ID: FR2 CA050/00-321, AL LAMINATED WITH HDPE WOVEN FABRIC USING POLYMER ON ONE SIDE AND MPET LAMINATED ON THE OTHER SIDE OF WOVEN FABRIC USING MODIFIED POLYMER. THE SPECIMEN WAS SUPPORTED ON RODS AND WIRE. THE SPECIMEN WAS TESTED WITH THE AL SIDE DOWN, TOWARDS THE TEST FLAMES.

TEST RESULTS

FLAMESPREAD INDEX: 6

SMOKE DEVELOPED INDEX: 45

SPECIMEN DATA . . .

Time to Ignition (sec): 30
 Time to Max FS (sec): 123
 Maximum FS (feet): 1.8
 Time to 500 °F (sec): Never Reached
 Max Temperature (°F): 518
 Time to Max Temperature (sec): 800
 Total Fuel Burned (cubic feet): 43.14

FS*Time Area (ft²*min): 13.8
 Smoke Area (%A*min): 46.3
 Fuel Area (F*min): 4452.5
 Fuel Contributed Value: 0
 Unrounded FSI: 7.1

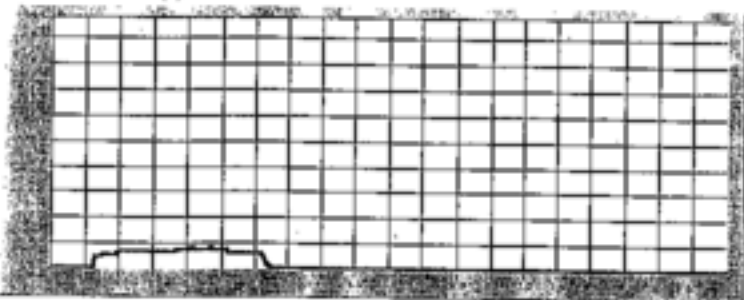
CALIBRATION DATA . . .

Time to Ignition of Last Red Oak (sec): 90
 Red Oak Smoke Area (%A*min): 100.00
 Red Oak Fuel Area (F*min): 8548
 Glass Fiber Board Fuel Area (F*min): 9211

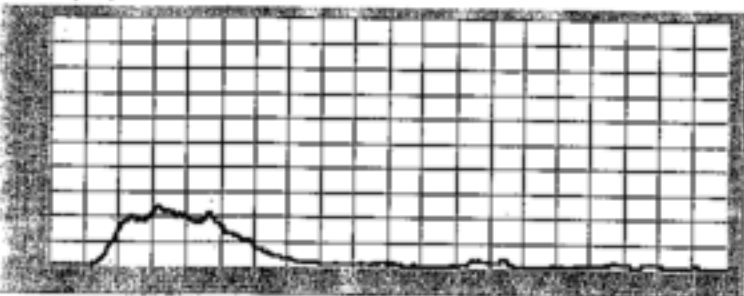


Project No. 15317-109713

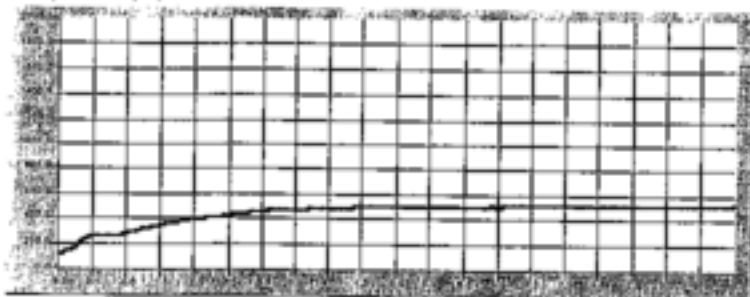
FLAME SPREAD (ft)



Smoke (%A)



Temperature (°F)



Time (min)

