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K-FLEX GULF MFG.
FIRE TEST REPORT

SCOPE OF WORK
ASTM E84 TESTING ON K-FLEX K-PROTECT

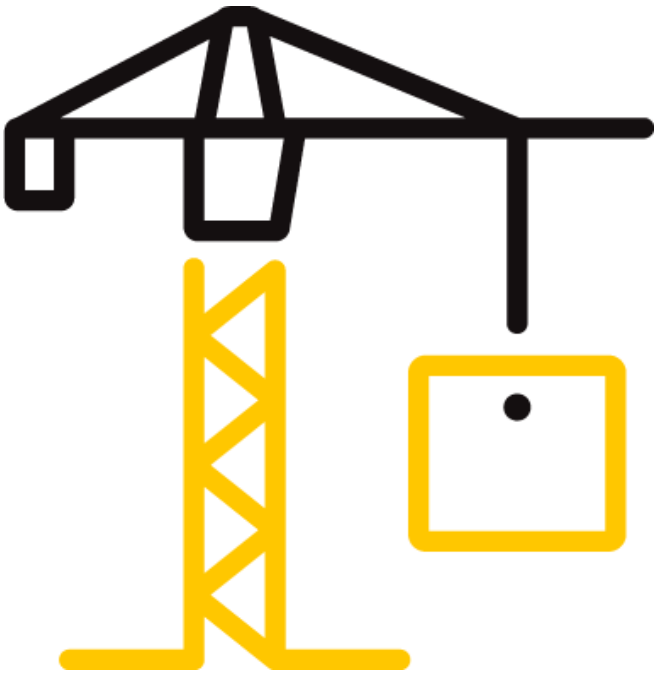
REPORT NUMBER
103400232SAT-004

TEST DATE(S)
2/7/18

ISSUE DATE
2/8/18

PAGES
10

DOCUMENT CONTROL NUMBER
RT-R-AMER-Test-2780 (10/18/17)



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TEST REPORT FOR K-FLEX GULF MFG.
Report No.: 103400232SAT-004
Date: 2/8/18

REPORT ISSUED TO

K-Flex Gulf Mfg.
Building No 4, WH No 4,
FNC Warehouse,
Near Lulu Logistics, DIP 2
Dubai, UAE.
PO Box: 112215

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by K-Flex Gulf Mfg., Building No 4, WH No 4, FNC Warehouse, Near Lulu Logistics, DIP 2 Dubai, UAE. PO Box: 112215, to evaluate the flame spread and smoke developed properties of K-FLEX K-PROTECT. Testing was conducted at the Intertek B&C test facility in Elmendorf, Texas. Results obtained are tested values and were secured by using the designated test method(s). A summary of test results and the complete graphical test data is reported herein.

This report does not constitute performance certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2

SUMMARY OF TEST RESULTS

Specimen I.D.: K-FLEX K-PROTECT

ASTM E84 Test Results

FLAME SPREAD INDEX	SMOKE DEVELOPED INDEX
5	40

For INTERTEK B&C:

COMPLETED BY:	Joseph Martinez	**REVIEWED BY:**	Servando Romo
TITLE:	Technician	**TITLE:**	Project Engineer
SIGNATURE:		**SIGNATURE:**	
DATE:	2/8/18	**DATE:**	2/9/18

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SECTION 3
TEST METHOD

The specimen was evaluated in accordance with the following:

> **ASTM E84-17**, *Standard Test Method for Surface Burning Characteristics of Building Materials*

SECTION 4
MATERIAL SOURCE/INSTALLATION

The test specimen was submitted to Intertek directly from the client. Samples were not independently selected for testing. Intertek has not verified the composition, manufacturing techniques or quality assurance procedures. The specimen, identified as K-FLEX K-PROTECT, was received in good order at the Evaluation Center on 2/2/18 and given identification number SAT1802050729-001.

SECTION 5
LIST OF OBSERVERS

NAME	COMPANY
Biju Thomas	K-Flex
Joseph Martinez	Intertek B&C
Samuel Barron	Intertek B&C

SECTION 6
TEST PROCEDURE

This report describes the results of testing conducted in accordance with ASTM E84-17; Standard Test Method for Surface Burning Characteristics of Building Materials. The test method is for comparative surface burning behavior of building materials by determining a flame spread index (FSI) and a smoke developed index (SDI). This test is generally applicable to exposed surfaces, such as finish materials for 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 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. This method may not be appropriate for obtaining comparative surface burning behavior of some cellular plastic materials. Testing of materials that melt, drip, or delaminate to such a degree that the continuity of the flame front is destroyed, results in low flame spread*

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> *indices that do not relate directly to indices obtained by testing materials that remain in place."* – ASTM E84-17 Section 1.3

The purpose of the method is to determine the relative burning behaviour of the material by observing the flame spread along the specimen. Flame spread and smoke density developed are reported, however, there is not necessarily a relationship between these two measurements.

SECTION 6 (Continued)

TEST PROCEDURE

It is the expressed intent of the test method to provide only comparative measurements of surface flame spread and smoke density of the tested material against measurements for select grade red oak flooring and fiber-cement board when tested under specific fire exposure conditions. The test method exposes a nominal 24-ft (7.32-m) long by 20-in. (508-mm) wide test specimen to a controlled air flow and flaming fire exposure adjusted to produce a specific flame spread distance vs time calibration using select grade red oak flooring.

The test method does not provide information regarding heat transmission through the tested surface, the effect of aggravated flame spread behavior resulting from the proximity of combustible walls and ceilings, or the classification or definition of materials as noncombustible using flame spread index alone.

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.

There were no deviations from the requirements prescribed in ASTM E84.

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SECTION 7
TEST SPECIMEN DESCRIPTION

MANUFACTURER*	K-Flex Gulf Mfg.
SPECIMEN DESCRIPTION*	Cross-linked PE (XPE) insulation
CONDITIONING TIME	5 days
SPECIMEN LENGTH	23.5 ft. (Four 70.5 in. long pieces of PE foam)
SPECIMEN WIDTH	20 in. (Ten 2 in. wide pieces of PE foam)
THICKNESS	0.4 in.
TOTAL WEIGHT	2 lbs.
COLOR	Black
ADHESIVE/COVERAGE RATE	N/A
SIDE TO FLAME*	Convex side
SUPPORT USED*	Rods and wire
MOUNTING METHOD	Standard
SUBSTRATE USED*	None
CEMENT BOARD	1/4 in. thick fiber cement board was placed on top of the sample.

*From the client's material description and/or instructions

Note: Specimens were conditioned as per the requirements of Section 6.4 of ASTM E84.

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SECTION 8
TEST RESULTS

TEST RESULTS	
Test Date	2/7/18
Test Operator	Joseph Martinez
Flame Spread Index (FSI)	5
Smoke Developed Index (SDI)	40
Red Oak Calibration (% * Min)	71.0

TEST DATA	
FSI (unrounded)	3.5
SDI (unrounded)	40.28
FS * Time Area (Ft * Min)	6.7
Smoke Area (% * Min)	28.6
Total Fuel Burned (Cubic Ft.)	45.01
Max Flame Front Advance (Ft.)	0.7
Time to Max Flame Front (sec)	30
Max Temp At Exposed T/C (°F)	518
Time To Max Temp (sec)	586

TEST OBSERVATIONS	
Ignition Time	0:08
Melting Observed	0:08
Sagging Observed	0:08
Flaming Drops Observed	0:10
Floor Flames Observed	0:10
After Flame Observed	0:60+
Observations After the Test:	
0 – 5 ft.	The PE foam was consumed.
5 – 24 ft.	The PE foam was melted to the floor.

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SECTION 9
PHOTOGRAPHS

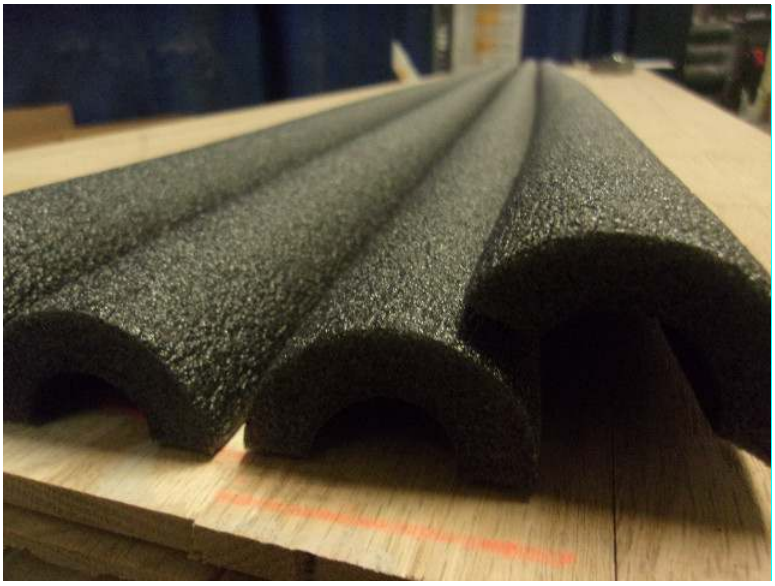

Photo No. 1
Exposed Surface of the Test Specimen (Pre-test)

Photo No. 2
Unexposed Surface of the Test Specimen (Pre-test)

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Photo No. 3
Unexposed Surface of the Test Specimen (Post-test)

Photo No. 4
Exposed Surface of the Test Specimen (Post-test)

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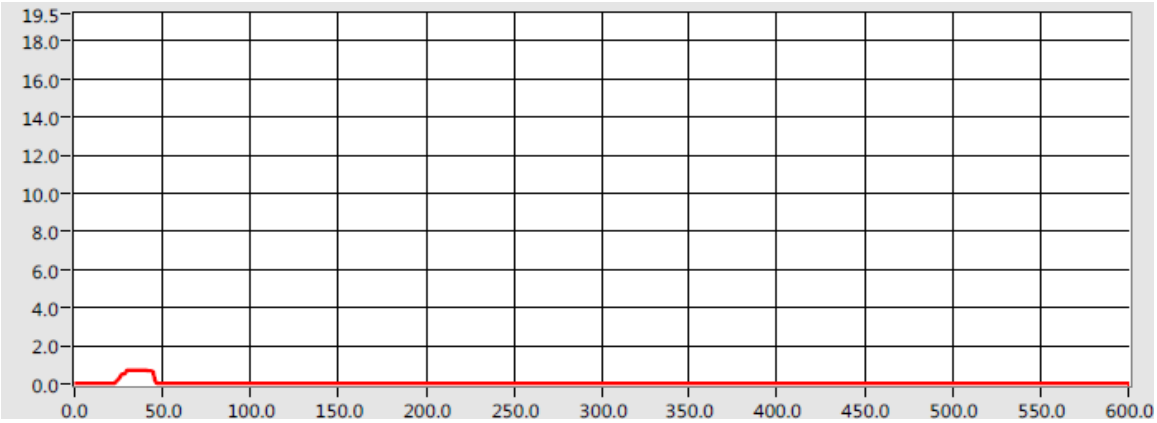
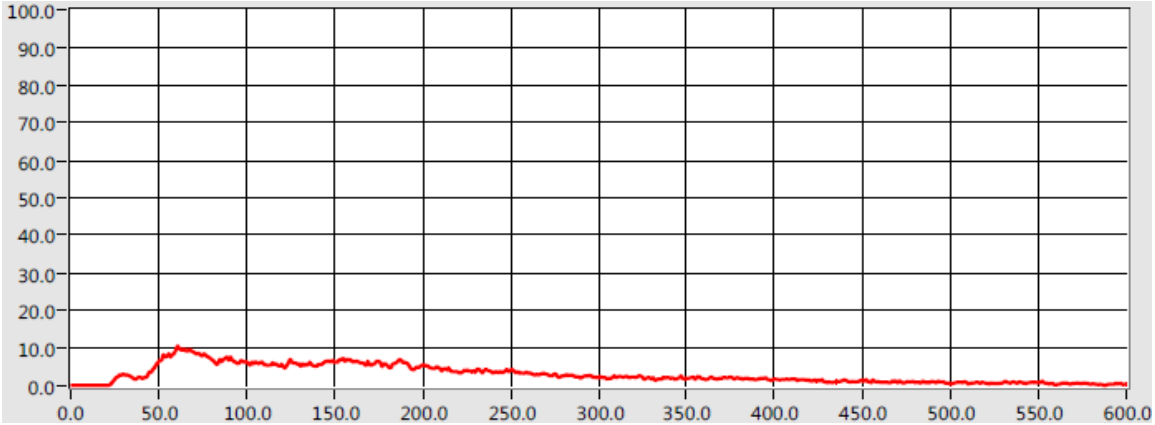
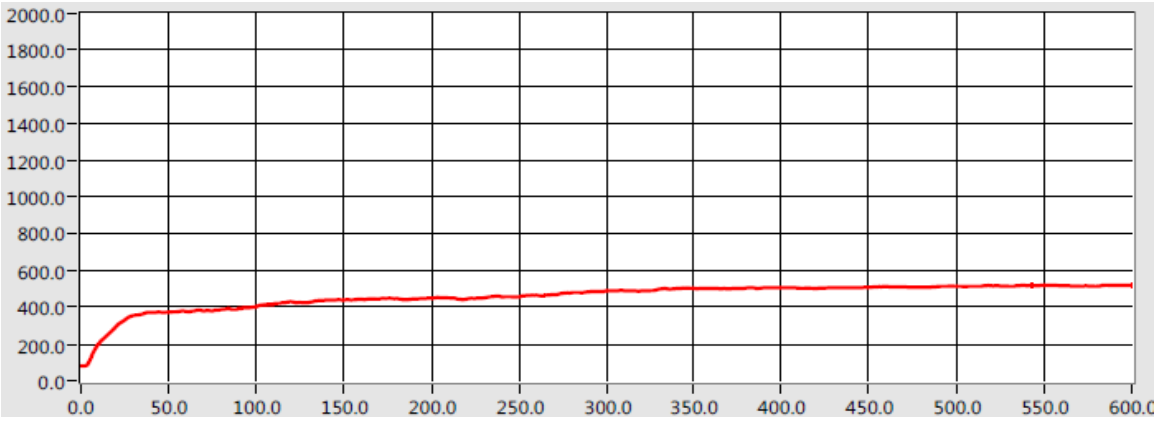
SECTION 10
GRAPHS



Graph No. 1 - Flame Spread Distance Versus Time



Graph No. 2 – Light Obscuration Versus Time



Graph No. 3 – Tunnel Air Temperature Versus Time

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SECTION 11
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	2/8/18	10	Original Report Issue