

Test Report No. 7191225252-MEC19/1-YWA
dated 16 Dec 2019
(221418029)

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SUBJECT:

Surface spread of flame test on Brand: "K-FLEX TITAN", Model: "K-FLEX TITAN" Nitrile Butadiene Rubber Elastomeric Foam with Co-extruded UV Resistant Jacketing for Outdoor / exposed HVAC systems for weather resistant application submitted by K-FLEX MALAYSIA SBN BHD on 11 Nov 2019.

TESTED FOR:

K-FLEX MALAYSIA SBN BHD
Lot 2752, Jalan Raja Nong
Taman Klang Jaya
41200 Klang
Selangor Darul Ehsan
Malaysia

DATE OF TEST:

20 Nov 2019

PURPOSE OF TEST:

To determine the tendency of the surface of a material or a combination of materials to support the spread of flame across its surface and to classify the surface according to the test given in British Standard 476 : Part 7 : 1997.

The test was conducted at TÜV SÜD PSB's fire test laboratory located at No. 10 Tuas Avenue 10, Singapore 639134.



LA-2007-0380-A LA-2007-0385-E
LA-2007-0381-F LA-2007-0386-C
LA-2007-0382-B LA-2010-0464-D
LA-2007-0383-G LA-2018-0702-B
LA-2007-0384-G LA-2018-0703-G

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection body/laboratory.

Laboratory:
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TÜV®



DESCRIPTION OF SPECIMENS:

Nine pieces of specimen, said to be Brand: "K-FLEX TITAN", Model: "K-FLEX TITAN" Nitrile Butadiene Rubber Elastomeric Foam with Co-extruded UV Resistant Jacketing for Outdoor / exposed HVAC systems for weather resistant application, each of nominal test size of 885mm x 270mm were received. The nominal thickness of the Lead Free Flexible Plastic Compound was measured to be 0.7mm. The nominal thickness of the Nitrile Butadiene Rubber Elastomeric Foam was measured to be approximately 28mm. The nominal thickness and bulk density of the steel sheet were measured to be 1.4mm and 7595kg/m³ respectively. The nominal thickness and bulk density of the specimen were measured to be 28.3mm and 77kg/m³ respectively.

Details of the product, as provided by the sponsor of test, are as follows:

Brand	"K-FLEX TITAN"
Model reference	"K-FLEX TITAN"
Generic product name	K-FLEX TITAN
Material composition	Lead Free Flexible Plastic Compound With UV Resistant / Nitrile Butadiene Rubber (NBR) Elastomeric Foam / Backing Material – Steel sheet
Country of Origin	Malaysia
Nominal thickness	-
Nominal bulk density	-
Fire retardant	Zinc Borate / ATH



Details of the product, as provided by the sponsor of test, are as follows: (Cont'd)

<p>Exterior Face: (Fire side)</p> <p>Brand – Material – Country of Origin – Nominal thickness – Nominal density – Color reference – Fire retardant –</p>	<p>“PK” Lead Free Flexible Plastic Compound With UV Resistant - - 120kg/m³ Black Zinc Borate</p>
<p>Core Material</p> <p>Brand – Material – Country of Origin – Nominal thickness – Nominal density – Color reference – Fire retardant –</p>	<p>“K-Flex ST” Nitrile Butadiene Rubber (NBR) Elastomeric Foam Malaysia - 70kg/m³ Black ATH</p>
<p>Backing Material</p> <p>Brand – Material – Country of Origin – Nominal thickness – Nominal density – Color reference – Fire retardant –</p>	<p>- Steel sheet - - - - -</p>
<p>Adhesive:</p> <p>Brand – Material –</p> <p>Country of Origin – Nominal thickness – Nominal density – Fire retardant –</p>	<p>N A - - - - -</p>



TEST PROCEDURE:

Prior to test, the specimens were prepared and conditioned in accordance with paragraphs 5.3 to 5.6 of the standard and secured to a specimen holder as described in paragraph 6.3.

Six specimens, backed with calcium silicate board, were tested with the Lead Free Flexible Plastic Compound face exposed to the specified thermal radiation from the apparatus described in paragraph 6.1 of the standard. The intensity of the radiated heat incident on the specimen varies with distance from the hotter end, so that when the specified calibration panel is mounted in the place to be occupied by the specimen, the irradiance of the radiometer is as given in Table 1. The test was terminated when the flame front reached the 825mm reference line, or after 10 minutes has elapsed, whichever is the shorter.

Table 1 : Irradiance Along Horizontal Reference Line on the Calibration Board

Distance along reference line from inside edge of specimen holder mm	Irradiance kW/m ²		
	specified	min.	max.
75	32.5	32.0	33.0
225	21.0	20.5	21.5
375	14.5	14.0	15.0
525	10.0	9.5	10.5
675	7.0	6.5	7.5
825	5.0	4.5	5.5

Yuy Ho



RESULTS OF TEST:

Specimen No.	1	2	3	4	5	6
Spread of flame at first 1½ minutes (mm)	0	0	0	0	0	0
Distance (mm)	Time of spread of flame to indicated distance (minutes • seconds)					
Start of flaming	0.13	0.13	0.14	0.15	0.14	0.17
75	-	-	-	-	-	0.21
165						-
190						
215						
240						
265						
290						
375						
455						
500						
525						
600						
675						
710						
750						
785						
825						
865						
Time of maximum spread of flame (minutes • seconds)	-	-	-	-	-	-
Distance of maximum spread of flame (mm)	0	0	0	0	0	0
Comments	1. For specimen 1, 3, 4 and 6, the first layer expanded, charred, disintergrated through its thickness, exposed the core material and progressed to 265mm to 290mm distances within the duration of test. 2. For specimen 2 and 5, the first layer expanded, charred, disintergrated through its thickness, exposed the core material and progressed to 240mm to 265mm distances within the duration of test. 3. For all six specimens, the first layer expanded, charred, disintergrated through its thickness, exposed the core material and progressed to 710mm to 750mm distances within the duration of test. 4. For specimen 1, 2, 3, 4, 5 and 6, the maximum flame time was 25 seconds, 30 seconds, 20 seconds, 55 seconds, 50 seconds and 58 seconds respectively.					

Ying He

Classification of Surface Spread of Flame

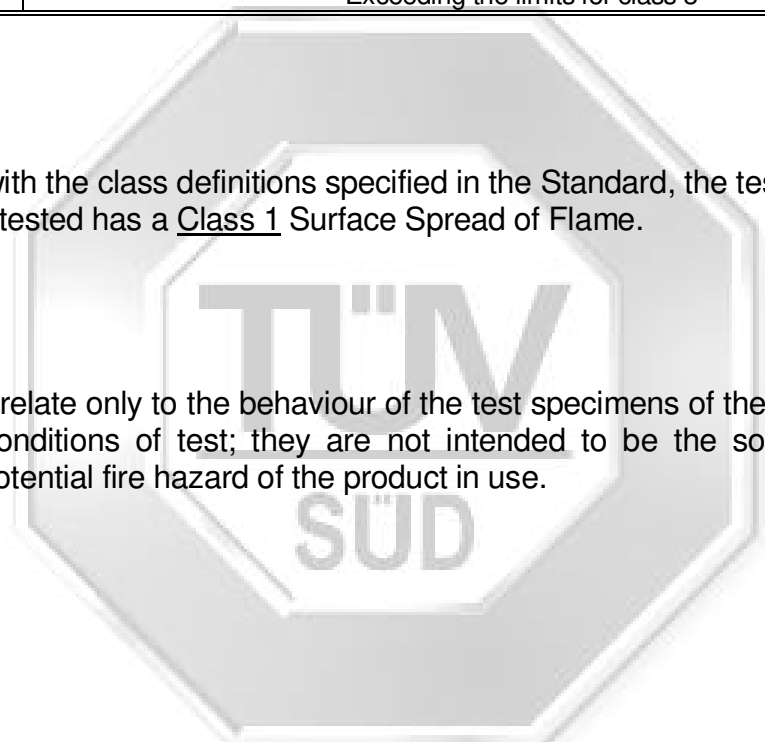
Classification	Spread of flame at 1.5 min.		Final spread of flame	
	Limit (mm)	Limit for one specimen in sample (mm)	Limit (mm)	Limit for one specimen in sample (mm)
Class 1	165	165 + 25	165	165 + 25
Class 2	215	215 + 25	455	455 + 45
Class 3	265	265 + 25	710	710 + 75
Class 4	Exceeding the limits for class 3			

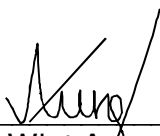
CONCLUSION:

In accordance with the class definitions specified in the Standard, the test results show that the sample tested has a Class 1 Surface Spread of Flame.

REMARKS:

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.




Ye Wint Aung
Higher Associate Engineer


Ong Kian Huat
Assistant Manager
Fire Property
Mechanical

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July 2011

