FIRE
TECHNOLOGY
SERVICES

Confidential Report

Our Ref: 27/02924/10/13

Notified Body
for PPE Directive,
Construction Products Directive
& Marine Equipment Directive
I.D. No. 0338 & 0339

Fire Technology Services
A division of BTTG T & C Ltd
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25 October 2013

Our Ref: 27/02924/10/13
Your Ref:

Client: KdB Insulation
88 Acton Road
Scarva
Co Armagh
Northern Ireland
BT63 6LF

Job Title: **Fire Test on One Sample of Material**

Clients Order Ref: --

Date of Receipt: 7 October 2013

Description of Sample: One sample of reflective insulation sheeting, referenced: **Air Reflect**.

Work Requested: Fire Technology Services were requested to carry out a fire test on the sample supplied to BS EN 13501-1 (stapled to calcium silicate board).

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FIRE TESTS ACCORDING TO BS EN ISO 11925-2:2010
Reaction to fire tests – Ignitability of building products subjected to direct impingement of flame – Part 2 Single-flame source test.

Date of Test: 25/10/13

Conditioning

Test specimens and filter paper conditioned as described in BS EN 13238:2010.

Procedure

The sample was tested in accordance with BS EN ISO 11925-2. The sponsor sampled the material and the specimens were cut to the dimensions stated.

Three length and three width specimens were prepared in accordance with the above standard. Specified filter paper was placed beneath the specimen holder and replaced between tests.

The specimens were mounted vertically in the specimen holder so that one end and both sides were enclosed with the exposed end 30mm from the end of the frame. The burner was inclined at an angle of 45º.

The flame height was set at 20 mm with the flame impinging on the specimen for 30 seconds on the centre line, 40 mm above the bottom edge .

A marker was placed 150 mm above the upper end of the burner and the time recorded when the flame tip reached the marker, if applicable. The following parameters were also recorded:-

1. If ignition occurs
2. Presence of flaming debris, if applicable
3. Ignition of the filter paper, if applicable

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Duration of test

For a flame application time of 30 seconds, the total test duration is 60 seconds after application of the flame.

Classification Criteria

The samples were classified according to BS EN 13501:2007 + A1:2009: Fire classification of Construction Products and Building Elements: Part 1: Classification using Test Data from Reaction to Fire Tests.

For construction products excluding floorings to meet the performance criteria taken from Table 1:

Classification	Classification Criteria (mean values)
E	Fs ≤ 150mm within 60 seconds
F	None (No performance determined)

Classification	Classification criteria for flaming droplets
None	Pass = no ignition of paper
d-2	Fail = Ignition of paper

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Results

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

Specimen		Ignition (Yes or No)	Time of flaming if ignition occurs (s)	Tip of flame reaches 150mm		Flaming droplets	
				Yes or No	Time taken (s)	Yes or No	Ignition of Filter paper (Yes, No or N/A)
Warp	1	No	N/A	No	N/A	No	No
	2	No	N/A	No	N/A	No	No
	3	No	N/A	No	N/A	No	No
Weft	1	No	N/A	No	N/A	No	No
	2	No	N/A	No	N/A	No	No
	3	No	N/A	No	N/A	No	No

N/A = Not applicable

Note

Sample was tested as an essentially flat product, the specimens were tested stapled onto a 12mm calcium silicate board as defined in BS EN 13238:2010. A surface exposure was carried out only.

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FIRE TESTS ACCORDING TO BS EN 13823:2010
Reaction to fire tests for Building Products - Building Products excluding floorings exposed to the thermal attack by a single burning item.
Classified According to BS EN 13501-1:2007 + A1:2009

Date of Test: 24/10/13

Conditioning

The specimens were conditioned in accordance with BS EN 13238:2010.

Principle

Test specimens, consisting of two vertical wings forming a right-angled corner, is exposed to the flames of a burner placed at the bottom of that corner. The flames are obtained by the combustion of propane gas, injected through a sandbox to give a heat output of 30.7±2.0kW.

The performance of the test specimen is evaluated over a period of 20 minutes. The performance requirements are: heat production, smoke production, lateral flame spread and falling flaming droplets and particles.

The heat production is measured by use of oxygen calorimeter that uses the principle that the amount of oxygen consumed in a fire is proportional to the amount of heat produced. The smoke production is measured by use of a light attenuation instrument installed in the exhaust duct alongside the sampling equipment used to measure the heat release. Visual observations are made of the horizontal flame spread and falling of flaming droplets and particles.

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Procedure

The test was carried out in accordance with BS EN 13823:2010.

Each specimen was tested stapled onto a 12mm calcium silicate board as defined in BS EN 13238:2010.

Each specimen was placed in the trolley as per the instructions given and placed underneath the hood in the testing chamber. The volume flow of the exhaust was set to 0.60±0.05 m^3/s and maintained at this throughout the test period.

The temperatures in the exhaust hood and the ambient temperature should be within 4°C with the ambient temperature being within 20±10°C. The other pre-test conditions of ambient pressure and ambient relative humidity were also recorded.

The recording of baseline data is started at 0 s. At 120 s the auxiliary burner is ignited and the propane mass flow adjusted to the specified flow before 150 s, this flow to be kept constant throughout the test.

With the pre-test conditions met, the propane supply is switched from the auxiliary burner to the main burner at 300 s.

The burning behaviour of the specimen was recorded both automatically and visually over a period of 1,260 s from when the main burner was ignited.

At 1560 s the gas supply was terminated along with the automatic recording of the data. The conditions at the end of the test were recorded at least one minute after any remaining combustion has been totally extinguished.

The individual pre-test and baseline conditions, apparatus specifications, test validity criteria, burner details was found to be within specified parameters. The graphs of HRR, HRR(30), THR, FIGRA, SPR, SPR(60), TSP and SMOGRA are found below with the results and classification.

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Classification Criteria

The samples were classified according to BS EN 13501:2007. Fire classification of Construction Products and Building Elements: Part 1: Classification using Test Data from Reaction to Fire Tests.

For construction products excluding floorings the classes are:

Classification	Classification Criteria (mean values)			
	$FIGRA_{0.2MJ}$ (W/s)	$FIGRA_{0.4MJ}$ (W/s)	LFS	THR_{600s} (MJ)
A2	≤120	N/A	Edge of specimen	≤7.5
B	≤120	N/A	Edge of specimen	≤7.5
C	N/A	≤250	Edge of specimen	≤15
D	N/A	≤750	No requirement	No requirement

To meet classification A2 the sample also has to meet the requirements of either BS EN ISO 1182:2010 or BS EN ISO 1716:2010.

To meet classification B, C and D the sample also has to meet the requirements of BS EN ISO 11925-2:2010.

Additional Classifications - Smoke and Flaming droplets/particles

Classification	Classification Criteria (mean values)	
	SMOGRA (m^2/s^2)	TSP_{600s} (m^2)
s1	≤30	≤50
s2	≤180	≤200
s3	Not s1 or s2	Not s1 or s2
d0	No flaming droplets/particles in BS EN 13823 within 600seconds	
d1	No flaming droplets/particles persisting longer than 10 seconds in BS EN 13823 within 600 seconds	
d2	Not d0 or d1	

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Results

Classification criteria	Specimen			Mean	Class
	1	2	3		
$FIGRA_{0.2MJ}$ (W/s) $FIGRA_{0.4MJ}$ (W/s) THR_{600s} (MJ) LFS to edge (yes or no)	TNR TNR 0.0 No	TNR TNR 0.0 No	TNR TNR 0.0 No	TNR TNR 0.0 No	**B**
SMOGRA (m^2/s^2) TSP_{600s} (m^2)	TNR 19.0	TNR 19.9	TNR 21.3	TNR 20.1	**s1**
FDP flaming ≤ 10 s (yes or no) FDP flaming > 10 s (yes or no)	No No	No No	No No	No No	**d0**

TNR Threshold not reached

Note

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

Comments

In our opinion, based on the tests carried out on the sample supplied;

a) the results of the BS EN ISO 11925-2:2010 test indicate the sample meets the requirements of a Class D. It should be noted that this is only class that can be achieved when tested to this method alone.

b) the results of the BS EN 13823:2010 test indicate the sample meets the requirements of a Class B, s1, d0 when tested to this method alone.

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Conclusion

In our opinion, the results indicate the sample when classified to BS EN 13501-1:2007 meets an overall classification of: **Class B, s1, d0.**

Reported by:…… B Marsden (Mrs), Fire Technician

Countersigned by:…….. P Doherty, Operational Head

Enquiries concerning this report should be addressed to Customer Services.