

**Test Report No. 7191271569-MEC21/04-JV**  
dated 26 Nov 2021

**Note:** This report is issued subject to the Testing and Certification Regulations of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.



PSB Singapore

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**SUBJECT:**

Determination of the toxic fume generated by Brand: "Lightherm" Model: "Lightherm Drymix – Lightweight Thermal Insulation Material" insulation material submitted by Eco Building Solutions Pte Ltd on 12 October 2021.

**TESTED FOR:**

Eco Building Solutions Pte Ltd  
1 Sunview Road  
#05-46, Eco Tech @ Sunview  
Singapore 627615

**DATE OF TEST:**

24 & 25 Nov 2021

**PURPOSE OF TEST:**

To determine the toxic fume generated from materials or products of thickness not exceeding 25.4mm when mounted in the horizontal position and tested in according to test method references T11.01 of BS EN 45545-2 : 2013 +A1 : 2015 Annex C, Method 1 (smoke chamber).

This test was conducted in accordance with the procedures specified in BS EN 45545-2:2013 +A1 : 2015 Annex C and using the apparatus and procedures specified in ISO 5659-2 : 2017.

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

Two handwritten signatures, "Vick" and "Koen", are placed side-by-side.



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**DESCRIPTION OF SAMPLES:**

Six pieces of specimen, said to be Brand: "Lightherm" Model: "Lightherm Drymix – Lightweight Thermal Insulation Material" insulation material, each of nominal size 75mm x 75mm x 25mm thick were received. The specimen thickness was reduced to meet the maximum testable thickness according to the standard. The area and bulk density of the specimen were measured to be 27.13 kg/m<sup>2</sup> and 522.1 kg/m<sup>3</sup> respectively.

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

Brand	Lightherm
Model reference	Lightherm Drymix – Lightweight Thermal Insulation Material
Generic product name	Lightweight thermal insulation material
Material composition	Polystyrene aggregate and cement
Country of origin	Malaysia
Manufacturer	Vodapruf Pte Ltd
Nominal bulk density	522.1 kg/m <sup>3</sup>
Nominal thickness	52mm
Fire retardant	N.A.

**Photograph of specimen:**



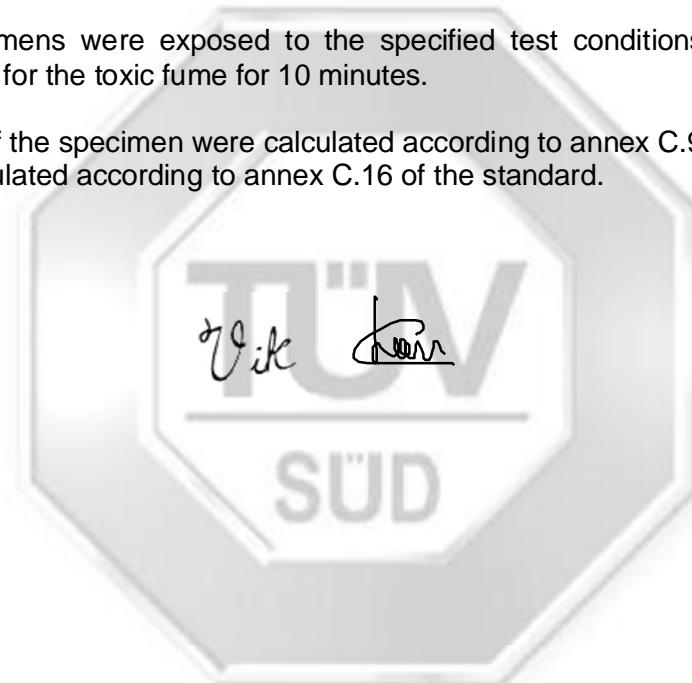
**TEST PROCEDURES:**

The test was conducted using the ISO 5659-2 smoke chamber (Asset No. 191010483) in conjunction with a FTIR Analyzer (Serial No. AFS-B2-C-1716) with their respective spreadsheets. Both systems, operating at the same time, were dedicated for the acquisition and analysis of opacity of the smoke and the qualitative and quantitative analysis of gases emitted during the test.

Prior to test, the specimens were prepared and conditioned in accordance to annex C.5 of BS EN 45545-2.

The test specimens were exposed to the specified test conditions according to Method T11.01 for the toxic fume for 10 minutes.

The gas data of the specimen were calculated according to annex C.9 and the CIT value was calculated according to annex C.16 of the standard.



**TEST RESULTS:**

Test Parameters	Specimen 1	Specimen 2	Specimen 3	Average
Time of ignition (sec)	0	0	0	0
Initial Mass (gm)	73.20	68.90	72.60	71.57
Final Mass (gm)	61.90	60.00	60.30	60.73
Mass Loss (gm)	11.30	8.90	12.30	10.83
Observations	1) Slight smoke emission observed on all specimens.			

The concentration of each gas sampled at 240s of test is as follows:

Gas	Specimen 1		Specimen 2		Specimen 3		Average	
	ppm	Kg/m <sup>3</sup>	ppm	Kg/m <sup>3</sup>	ppm	Kg/m <sup>3</sup>	ppm	Kg/m <sup>3</sup>
Carbon Dioxide (CO <sub>2</sub> )	264.60	0.00	295.74	0.00	215.48	0.00	258.60	0.00
Carbon Monoxide (CO)	10.31	0.00	4.36	0.00	4.40	0.00	6.35	0.00
Nitrogen Oxide (NO)	ND	ND	ND	ND	ND	ND	ND	ND
(NO <sub>x</sub> ) NO <sub>2</sub>	ND	ND	ND	ND	ND	ND	ND	ND
Sulphur Dioxide (SO <sub>2</sub> )	9.94	0.00	11.35	0.00	17.82	0.00	13.04	0.00
Hydrogen Chloride (HCl)	ND	ND	ND	ND	ND	ND	ND	ND
Hydrogen Bromide (HBr)	0.45	0.00	ND	ND	ND	ND	0.45	0.00
Hydrogen Fluoride (HF)	ND	ND	ND	ND	ND	ND	ND	ND
Hydrogen Cyanide (HCN)	ND	ND	ND	ND	ND	ND	ND	ND
CIT <sub>G</sub>	0.00		0.00		0.00		0.00	

\*ND – Not Detected



**TEST RESULTS (cont'd):**

The concentration of each gas sampled at 480s of test is as follows:

Gas	Specimen 1		Specimen 2		Specimen 3		Average	
	ppm	Kg/m <sup>3</sup>	ppm	Kg/m <sup>3</sup>	ppm	Kg/m <sup>3</sup>	ppm	Kg/m <sup>3</sup>
Carbon Dioxide (CO <sub>2</sub> )	314.02	0.00	320.90	0.00	263.93	0.00	299.62	0.00
Carbon Monoxide (CO)	18.89	0.00	15.12	0.00	4.11	0.00	12.71	0.00
Nitrogen Oxide (NO <sub>x</sub> )	NO	ND	ND	ND	ND	ND	ND	ND
	NO2	ND	ND	ND	ND	ND	ND	ND
Sulphur Dioxide (SO <sub>2</sub> )	13.10	0.00	13.28	0.00	17.33	0.00	14.57	0.00
Hydrogen Chloride (HCl)	2.73	0.00	0.21	0.00	0.55	0.00	1.16	0.00
Hydrogen Bromide (HBr)	4.51	0.00	0.47	0.00	0.61	0.00	1.86	0.00
Hydrogen Fluoride (HF)	ND	ND	ND	ND	ND	ND	ND	ND
Hydrogen Cyanide (HCN)	ND	ND	ND	ND	ND	ND	ND	ND
CIT <sub>G</sub>	0.00		0.00		0.00		0.00	

\*ND – Not Detected



**CONCLUSION:**

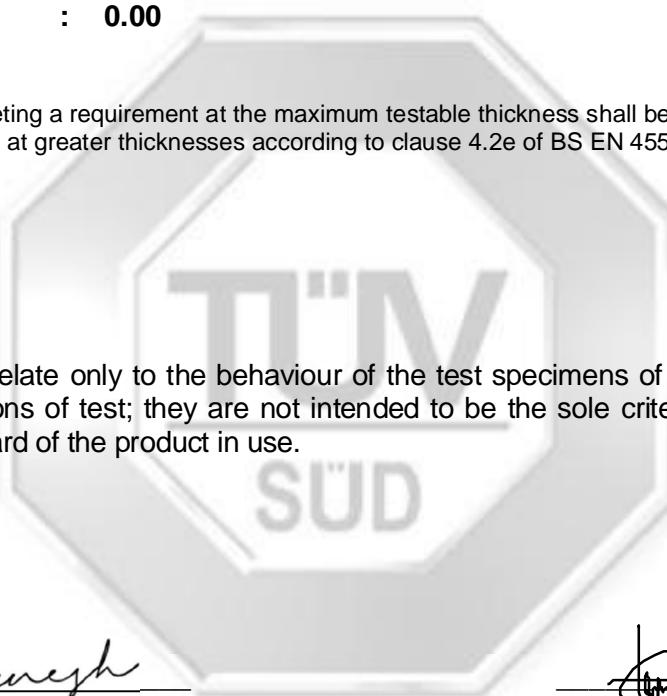
In accordance to test method references T11.01 of BS EN 45545-2 : 2013 +A1 : 2015 Annex C, Method 1 (smoke chamber) method **Brand: "Lightherm" Model: "Lightherm Drymix – Lightweight Thermal Insulation Material" (52mm thick, 27.13 kg/m<sup>2</sup>) insulation material**, achieved the following average values:

**CIT<sub>G</sub> at 240 sec : 0.00**  
**CIT<sub>G</sub> at 480 sec : 0.00**

Note: A product meeting a requirement at the maximum testable thickness shall be considered to comply with the requirement at greater thicknesses according to clause 4.2e of BS EN 45545-2: 2013+A1: 2015

**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.

  
Viknesh

Vikneshwaran Jayaraman  
Assistant Manager

  
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Chan Lung Toa  
Assistant Vice President  
Fire Testing  
Mechanical Centre

**Test Report No. 7191271569-MEC21/04-JV**  
**dated 26 Nov 2021**



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Effective 26 January 2021