Test Report No. 7191141775-MEC16/2-JV
dated 14 Jul 2016

PSB Singapore

Choose certainty.
Add value.

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.

SUBJECT:

Ignitability of product when subjected to direct flame impingement test on on 'MKS PIR100' MKS PIR sandwich insulation panel (nominally 100mm thick, 125kg/m^3) with 0.5mm thick steel facings submitted by Munkong Steel Co., Ltd on 15 Jun 2016.

TESTED FOR:

Munkong Steel Co., Ltd
1/348 Soi.Onnuch 59/1, Sukhumvit 77 Rd
Prawet, Bangkok
Thailand 10250

DATE OF TEST:

04 Jul 2016

PURPOSE OF TEST:

To determine the ignitability of the product when subjected to direct impingement of flame according to EN ISO 11925-2 : 2010 Part 2: Single-flame source test (BS EN ISO 11925-2:2010).

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

TÜV SÜD PSB

ilac-MRA

ACCREDITED LABORATORY SAC-SINGLAS

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

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

Laboratory:
TÜV SÜD PSB Pte. Ltd.
No.1 Science Park Drive
Singapore 118221

Phone : +65-6885 1333
Fax : +65-6776 8670
E-mail: enquiries@tuv-sud-psb.sg
www.tuv-sud-psb.sg
Co. Reg : 199002667R

Regional Head Office:
TÜV SÜD Asia Pacific Pte. Ltd.
1 Science Park Drive, #02-01
Singapore 118221

DESCRIPTION OF SPECIMEN:

Twenty pieces of specimen, said to be 'MKS PIR100' MKS PIR sandwich insulation panel (nominally 100mm thick, 125kg/m^3) with 0.5mm thick steel facings, each of nominal size 250mm x 90mm x 60mm were received.

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

Product manufactured / supplied by : Company Address	 Munkong Steel Co., Ltd 1/348 Soi.Onnuch 59/1, Sukhumvit 77 Rd Prawet, Prawet, Bangkok Thailand 10250
Brand & Model reference	MKS PIR100
Generic product name	MKS PIR Sandwich Insulation Panel
Material composition	Polyisocyanurate (PIR) Insulated Sandwich Panel
Nominal mass per unit area	12.5kg/m^2
Nominal thickness	100mm
Fire retardant	TCPP and TEP

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

Exterior face #1: Material – Manufacturer – Thickness – Mass per unit area – Color reference – Fire retardant –	 Metal Sheet NS Blue Scope (Thailand) Limited 0.50mm (BMT) 4.26kg/m^2 Off White -
Exterior face #2: Material – Manufacturer – Thickness – Mass per unit area – Color reference – Fire retardant –	 Metal Sheet NS Blue Scope (Thailand) Limited 0.50mm (BMT) 4.26kg/m^2 Off White -
Core material: Material – Manufacturer – Thickness – Mass per unit area – Color reference – Fire retardant –	 Polyisocyanurate (Polyol Voratherm CN633 + Isocyanurate Voranate M600) Dow Chemical (Thailand) Limited 100mm 50kg/m^2 Yellowish TCPP and TEP
Adhesive: Material – Manufacturer – Thickness – Mass per unit area – Color reference – Fire retardant –	 Polyol Voracore CM938 + Isocyanate Voranate M600 Dow Chemical (Thailand) Limited - 80g/m^2 Dark Brown/Yellowish

TEST PROCEDURE:

Prior to test, the specimens were prepared in accordance with clause 5 of the standard and conditioned at a temperature of (23 ±2)°C and relative humidity of (50 ±5)% for a minimum period of 48 hours.

The apparatus was constructed in accordance to clause 4 of the standard.

The specimens were subjected to the test environment as described in clause 4.1 and tested according to clause 7 of the standard.

The test results are shown in Table 1 and 2.

TEST RESULTS:

Table 1: Test Flame Surface Application Position

Temperature (°C)	23.5		R.H (%)	62.6		
Specimen thickness (mm)	60		Flame application time (sec)	30		
Specimen no.	1	2	3	4	5	6
Airflow velocity (m/s)	0.7	0.7	0.7	0.7	0.7	0.7
Ignition (Y/N)	N	N	N	N	N	N
Time for flame tip to reach 150mm (sec)	-	-	-	-	-	-
Maximum flame height (mm)	0	0	0	0	0	0
Flaming droplets presence (Y/N)	N	N	N	N	N	N
Filter paper ignited by flaming droplets / particles? (Y/N)	N	N	N	N	N	N

Table 1: Test Flame Edge Application Position

Temperature (°C)	23.5		R.H (%)	62.6		
Specimen thickness (mm)	60		Flame application time (sec)	30		
Specimen no.	1	2	3	4	5	6
Airflow velocity (m/s)	0.7	0.7	0.7	0.7	0.7	0.7
Ignition (Y/N)	N	N	N	N	N	N
Time for flame tip to reach 150mm (sec)	-	-	-	-	-	-
Maximum flame height (mm)	0	0	0	0	0	0
Flaming droplets presence (Y/N)	N	N	N	N	N	N
Filter paper ignited by flaming droplets / particles? (Y/N)	N	N	N	N	N	N

PSB Singapore

REMARKS:

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

WITNESSES:

The test was witnessed by the following representatives:

Munkong Steel Co., Ltd	:	Mr Jeerasak Jommongkol Mr Thana Chaichanpankt
Dow Chemical (Thailand) Limited	:	Mr Narakan Puapan Mr Kanmetha Nuamsiri

Leong Gene-Jhou
Senior Associate Engineer

Joseph Chng
Assistant Vice President
(Fire Property)
Mechanical

PSB Singapore

Please note that this Report is issued under the following terms :

1. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that TÜV SÜD PSB approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB in any way "guarantees" the later performance of the product/equipment. Unless otherwise stated in this report, no tests were conducted to determine long term effects of using the specific product/equipment.

2. The sample/s mentioned in this report is/are submitted/supplied/manufactured by the Client. TÜV SÜD PSB therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.

3. Nothing in this report shall be interpreted to mean that TÜV SÜD PSB has verified or ascertained any endorsement or marks from any other testing authority or bodies that may be found on that sample.

4. This report shall not be reproduced wholly or in parts and no reference shall be made by the Client to TÜV SÜD PSB or to the report or results furnished by TÜV SÜD PSB in any advertisements or sales promotion.

5. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, No.1 Science Park Drive Singapore 118221.

July 2011