

Test Report No. 7191128873-MEC15/1-JV
dated 05 Feb 2016



PSB Singapore

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.

**Choose certainty.
Add value.**

SUBJECT:

Determination of the gross heat of combustion (calorific value) of 'UCO SolidPanel' precast lightweight wall panel submitted by UAC Bhd on 22 Dec 2015.

TESTED FOR:

UAC Bhd
Level 10 MENARA UAC
12 Jalan PJU 7/5, Mutiara Damansara
47800 Petaling Jaya
Selangor Darul Ehsan, Malaysia
P.O. Box 9133, Pejabat Pos Kelana Jaya
46805 Petaling Jaya
Selangor Darul Ehsan, Malaysia

DATE OF TEST:

21 Jan to 04 Feb 2016

PURPOSE OF TEST:

To determine the gross heat of combustion (calorific value) of products at constant volume in a bomb calorimeter according to the test specified in BS EN ISO 1716 : 2010 "Reaction to fire tests for products – Determination of the gross heat of combustion".

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



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
TUV®



DESCRIPTION OF SPECIMENS:

Four pieces of specimen, said to be 'UCO SolidPanel' precast lightweight wall panel, each of nominal size of 250mm x 250mm x 49mm were received. The nominal bulk density of the specimen was found to be 927 kg/m³.

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

Product manufacturer:	
Company Address	UAC Bhd Level 10 MENARA UAC 12 Jalan PJU 7/5, Mutiara Damansara 47800 Petaling Jaya Selangor Darul Ehsan, Malaysia
Brand & Model reference	UCO SolidPanel
Generic product name	Precast Lightweight Wall Panel (External & Internal)
Material composition	Silica, Ordinary Portland Cement OPC, Cellulose Fiber, Expanded Polystyrene
Nominal mass per unit area (kg/m ²)	63.75kg/m ² (75mm thickness), 85.0kg/m ² (100mm thickness) – Equilibrium Condition
Nominal thickness (mm)	75mm & 100mm

TEST PROCEDURES:

Prior to test, the test specimens were prepared in accordance to clauses 7.2 to 7.5. The test specimens were then conditioned for a minimum of 48 hours at a temperature of (23 ±2)°C and relative humidity of (50±5)% until constant mass is achieved as according to clause 7.6.

The equipment was calibrated according to the method described in clause 8.2 and specimens tested according to clause 8.3 of the standard. A minimum of three tests were conducted for each material type in order for the material to be evaluated.

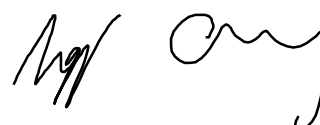
The gross heat of combustion of the test specimen was calculated in accordance with clause 9.3, 9.4 and Annex D of the standard using the following equation:

$$Q_{PCS} = \frac{E(T_m - T_i + c) - b}{m}$$

The criteria for validity of the test results are shown in Table 1.

Table 1 : Criteria for the validity of test results

Gross heat of combustion	Max. and min. of the three replicated tests	Range of validity
Q _{PCS} (MJ/kg)	≤ 0.2 MJ/kg Within 5% Within 10%	From 0 MJ/kg to 3.2 MJ/kg From 3.2 MJ/kg to 20.0 MJ/kg Greater than 20.0 MJ/kg
Q _{PCS} (MJ/m ²) ^a	≤ 0.1 MJ/m ² Within 5% Within 10%	From 0 MJ/m ² to 4.1 MJ/m ² From 4.1 MJ/m ² to 20 MJ/m ² Greater than 20 MJ/m ²
^a for non-substantial components only		





TEST RESULTS:

Material:	Precast Lightweight Wall Panel			
Method:	crucible			
Combustion aid:	Benzoic acid			
Mass ratio (sample: combustion aid):	1 : 1			
Number of test runs:	10			
Water equivalent, (MJ/K):	0.01002			
	Specimen Mass (gm)	Temperature Rise (°C)	Gross Heat (MJ/kg)	Gross Heat (MJ/m ²)
Test run #1:	0.5038	1.3433	0.0014	0.0632
Test run #2:	0.5042	1.3357	-0.0861	-3.8857
Test run #3:	0.5015	1.3256	-0.1891	-8.5341
Average Q _{PCS} value of three test results (MJ/m ²):	-0.09			
Maximum Q _{PCS} – Minimum Q _{PCS} (MJ/m ²):	0.19			
Maximum Q _{PCS} – Minimum Q _{PCS} (%):	208.73			

OBSERVATIONS:

The specimens were fully combusted.


CONCLUSION:

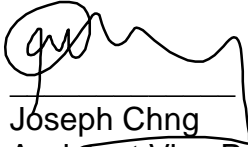
The total average gross heat of combustion of the product was -0.09MJ/kg with the Maximum Q_{PCS} and Minimum Q_{PCS} value difference of 0.19MJ/kg. This equated to 208.73% of the average Q_{PCS} value.

For the validity of test results, the tested specimen's gross heat of combustion meets the criteria specified in clause 11 of the standard for the range of 0 MJ/kg to 3.2 MJ/kg of ≤ 0.2MJ/kg.

REMARKS:

The test results relate to the behaviour of the test specimens of a 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.


Leong Gene-Jhou
Senior Associate Engineer


Joseph Chng
Assistant Vice President
(Fire Property)
Mechanical



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

