

**Test Report No. 7191204657-MEC19/2-YWA**  
dated 04 Mar 2019



PSB Singapore

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Inspire trust.**

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**SUBJECT:**

Fire propagation test on "ALCOTOP / FR" Aluminium Composite Panel for roofing submitted by World Mech' Tech' Co., Ltd. on 01 Feb 2019.

**TESTED FOR:**

World Mech' Tech' Co., Ltd.  
8-105, Jangjae-Ro  
520beon-Gil  
Saengrim-Myeon Gimhae-Si  
Gyeongsangnam-Do (50801)  
South Korea

**DATE OF TEST:**

27 Feb 2019

**PURPOSE OF TEST:**

To determine the Index of Performance of the material when it is exposed to the conditions of the test specified in British Standard 476 : Part 6 : 1989 + A1 : 2009 "Method of test for fire propagation for products".

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-2007-0381-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 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.
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**TUV®**



**DESCRIPTION OF SPECIMENS:**

Six pieces of specimen, said to be “ALCOTOP / FR” (4mm thick) Aluminium Composite Panel for roofing comprising of Top: 0.5mm thick Aluminium skin with PVDF (approximately 25µm) coating / FR core: Mineral core (3mm thick) / Bottom: 0.5mm thick Aluminium skin with Cromate finish, each of nominal test size of 225mm x 225mm were received. The Additive and Adhesive used was said to be Ldpe and Adhesive film and glue respectively. The Fire Retardant used was said to be Magnesium Hydroxide. The bulk density of the specimen was found to be approximately 2053kg/m<sup>3</sup>.

**TEST PROCEDURE:**

Prior to test, the specimens were prepared and conditioned in accordance with paragraph 4.4 of the standard.

Three specimens, backed with 25mm air gap calcium silicate spacer, were tested with PVDF coating face exposed to the specified heating conditions, in an apparatus conforming to paragraph 5 and illustrated in Figures 1 to 3 of the Standard.

The calibration and test procedures were as defined in paragraphs 8 and 9, and appendix B clause (b) respectively, of the specification. The apparatus was calibrated prior to test and the actual calibration curve obtained is shown in Figure 1 of this report.

The mean temperature rise above ambient obtained from three specimens is also shown in Figure 1 (i.e. with the actual calibration curve). The mean temperature readings for the material and the calibration curve were obtained at the following intervals from the start of the test: at 1/2 minute intervals up to 3 minutes, at 1 minute intervals from 4 to 10 minutes, and at 2 minutes intervals from 12 to 20 minutes.

A handwritten signature in black ink, appearing to read 'Yuy' followed by a stylized initial or name.

From these readings, the index of performance for the material was determined as follows:

$$s_1 = \sum_{t=0.5}^{t=3} \frac{\Theta_s - \Theta_c}{10t}; \quad s_2 = \sum_{t=4}^{t=10} \frac{\Theta_s - \Theta_c}{10t}$$

and  $s_3 = \sum_{t=12}^{t=20} \frac{\Theta_s - \Theta_c}{10t};$

$$S = s_1 + s_2 + s_3$$

where  $S$  = Index of performance for each of the specimens tested and  $s_1$ ,  $s_2$  and  $s_3$  are sub-indices

$t$  = Time in minutes from the origin at which readings are taken.

$\Theta_s$  = Temperature rise in deg. C for the specimen at time,  $t$

$\Theta_c$  = Temperature rise in deg. C for the calibration sheet at time,  $t$

In computations only the positive value of  $\frac{\Theta_s - \Theta_c}{10t}$  was used.





**RESULTS OF TEST:**

The following test results were obtained for each specimen tested:

Specimen	Sub-Indices			Index of Performance
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S
A	0.0	0.0	0.7	0.7
B	0.0	0.0	0.0	0.0
C	0.0	0.1	0.2	0.3

**CONCLUSION:**

The test results obtained, as an average of the 3 samples tested are as follows:

Index of overall performance, I  
(Fire propagation index) = 0.3

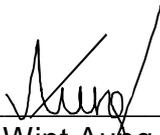
Sub-index, i<sub>1</sub> = 0.0

Sub-index, i<sub>2</sub> = 0.0

Sub-index, i<sub>3</sub> = 0.3

**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  
Senior Associate Engineer  
Fire Property  
Mechanical

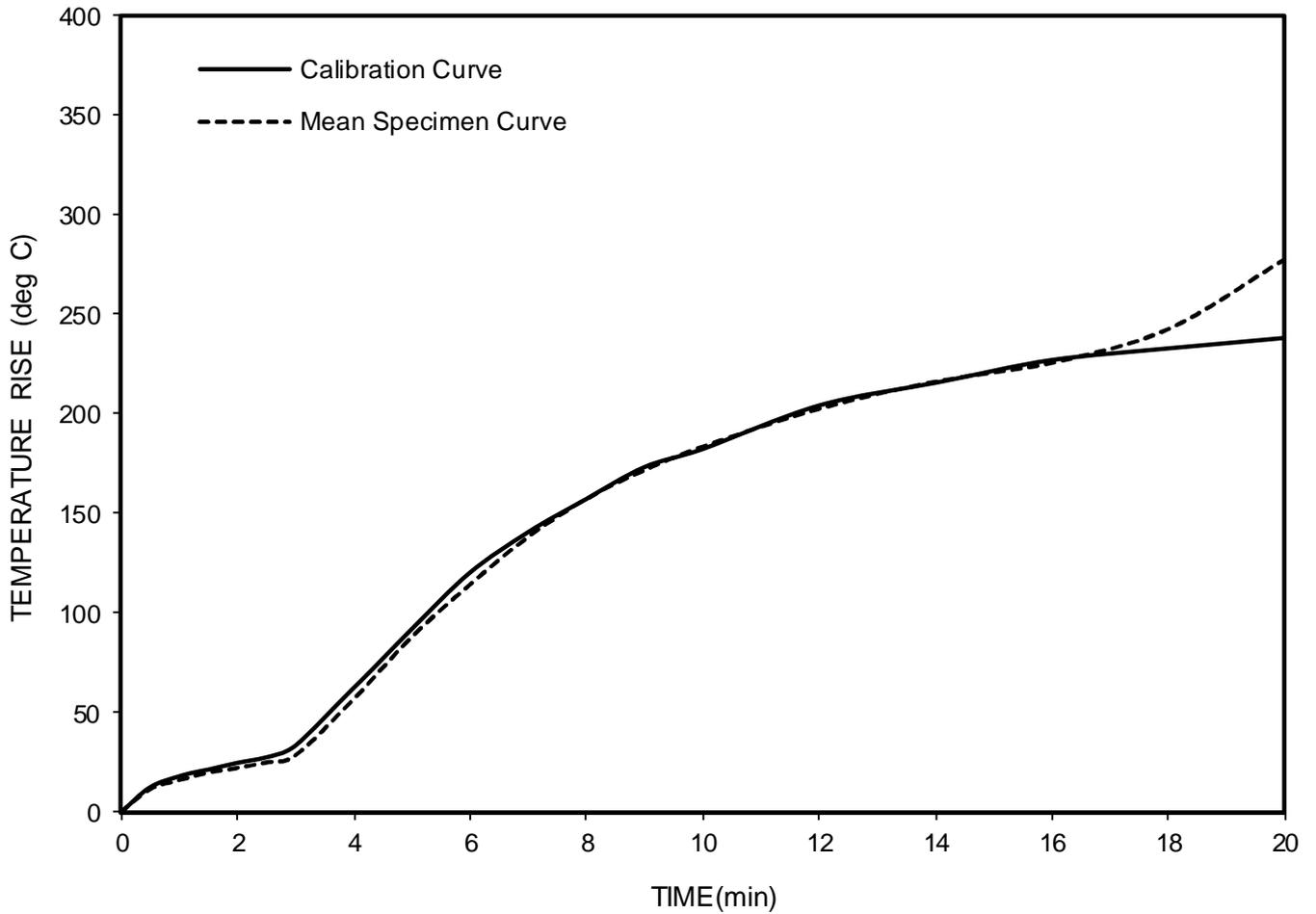


FIGURE 1 : COMPARISON OF MEAN SPECIMEN AND CALIBRATION CURVES



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July 2011

