

Test Report No. 0719159785/2/YWA
dated 20 Oct 2009



PSB Singapore

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SUBJECT:

Fire propagation test on "Greenlam" Compact General Purpose High Pressure Decorative Laminate (Type S. CGS) material submitted by GREENLAM ASIA PACIFIC PTE LTD on 01 Sep 2009.

TESTED FOR:

GREENLAM ASIA PACIFIC PTE LTD
18 Sungei Kadut Street 2
Singapore 729236

Attn: Ms Serene Su

DATE OF TEST:

15 Oct 2009

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 "Method of test for fire propagation for products".

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



Laboratory:
TUV SUD PSB Pte. Ltd.
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TUV®

		LA-2007-0380-A LA-2007-0380-A-1 LA-2007-0381-F LA-2007-0382-B LA-2007-0383-G LA-2007-0384-G LA-2007-0385-E LA-2007-0386-C	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.
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DESCRIPTION OF SPECIMENS:

Six pieces of specimen, said to be be "Greenlam" (12mm thick x 1.4gm/cc) Compact General Purpose High Pressure Decorative Laminate material (Type S. CGS), each of nominal size of 225mm x 225mm were submitted. The fire retardant used was said to be Ammonium Bromide. The bulk density of the specimen was found to be approximately 1454kg/m³.

TEST PROCEDURE:

Three specimens, backed with calcium silicate board, were tested with either 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 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 be 'Ng Joo', is written over a large, faint, semi-transparent watermark of the TÜV SÜD logo in the background.



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.

Θ_s = Temperature rise in deg. C for the specimen at time, t

Θ_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 ₁	S ₂	S ₃	S
A	1.1	8.0	5.2	14.3
B	1.6	9.4	5.1	16.1
C	0.7	9.3	5.3	15.2

CONCLUSION:

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

Index of overall performance, I = 15.2
(Fire propagation index)


Sub-index, i₁ = 1.1

Sub-index, i₂ = 8.9

Sub-index, i₃ = 5.2

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.



Leong Gene-Jhou
Associate Engineer



Chan Lung Toa
Product Manager
(Fire Safety & Security Products)
Mechanical Centre

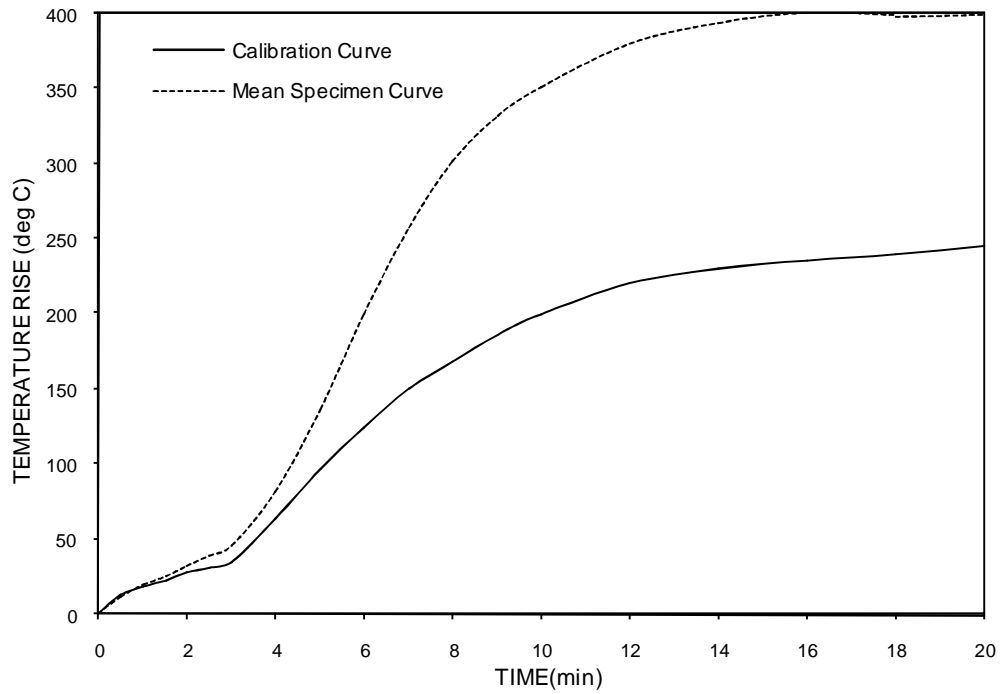


FIGURE 1 : COMPARISON OF MEAN SPECIMEN AND CALIBRATION CURVES

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March 2009