



# FIRE ASSESSMENT REPORT

## FC11047

### ASSESSMENT OF THE REACTION TO FIRE OF MUSE PRINTED

#### CLIENT

Woven Image Pty  
37-39 Chard Road  
Brookvale  
NSW 2100  
Australia



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## ASSESSMENT OBJECTIVE

To assess the reaction to fire performance of Muse Printed, a PET Laminated panel with print on the fire exposed face.

## CONCLUSION

It is considered that the Muse Printed product in 9 mm thickness when tested in accordance with AS ISO 9705 or ISO 9705 would achieve the following classifications.

- Building Code of Australia Group 1 Classification, with Smoke Growth Rate Index (SMOGRARC) less than 100 ( $\text{m}^2/\text{s}^2 \times 1000$ ), in accordance with BCA Specification C1.10.
- New Zealand Building Code Group 1-S Classification in Accordance with C/VM2, New Zealand Building Code Clauses C1-C6.

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## DOCUMENT REVISION STATUS

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# 1. INTRODUCTION

Muse Printed is described as a PET Laminated panel with print on face. The product being considered in this assessment is 9 mm thick. It is used primarily for decorative purposes and sound insulation or absorption.

# 2. BACKGROUND

Various similar Muse products to the one being considered in this assessment have been tested as follows:

In Exova Report No 56751500.2 the product tested to AS ISO 9705 - 2003 was Woven Image Muse 9 mm PET\* Panel comprising a 1.5 mm (100% PET of which 68% was stated to be recycled) was laminated to 7.8 mm (100% PET of which 70% was stated to be recycled). The measured weight was 1.81 kg/m<sup>2</sup>. The test result as assessed to AS 5637.1:2015 was Group Number 1 with a SMOGRA of 0.4 m<sup>2</sup>s<sup>-2</sup> x 1000.

In AWTA Test Report 17-007073 the product tested to AS/NZS 3837-1998 was Muse (stated by the client to be to the same specification as tested in the above Exova test) with a nominal thickness of 9 mm and weight of 1.76 kg/m<sup>2</sup>. The test result was assessed in accordance with AS 5637.1:2015 as Group Number 3 with an ASEA of 368.9 m<sup>2</sup>/kg.

In AWTA Test Report 18-003989 the product tested to AS/NZS 3837-1998 was Muse Tile described as 100% polyethylene (68% recycled with a PSA (self adhesive) backing and a nominal thickness of 10 mm and weight of 2 kg/m<sup>2</sup>). The test result was assessed in accordance with AS 5637.1:2015 as Group Number 3 with an ASEA of 215.2 m<sup>2</sup>/kg.

In AWTA Test Report 18-004491 the product tested to AS/NZS 3837-1998 was Muse Tile Printed described as 100% Polyethylene (68% recycled polyester, 32% polyester with a PSA (self-adhesive) backing. The test result was assessed in accordance with AS 5637.1:2015 as Group Number 3 with an ASEA of 143.1 m<sup>2</sup>/kg.

In summary the assessed Group numbers for the above tested specimens are:

- Muse- PET Laminated Panel, AS/NZS 3837 Group 3 and ISO 9705, Group 1
- Muse Tile- PET Laminated with PSA backing, AS/NZS 3837 Group 3
- Muse Tile Printed- PET Laminated panel with print on face and PSA backing, AS/NZS 3837 Group 3

\*PET is Polyethylene terephthalate is the most common thermoplastic polymer of the polyester family.



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### 3. DISCUSSION

The client provided samples of the product to be assessed along with the three products that have been tested. The physical properties of the polyester products under consideration in this assessment are listed in Table 1.

**Table 1: Physical properties of Muse PET products and tested Group No.**

Product Name	Composition	Thickness, mm *	Weight, kg/m <sup>2</sup> *	Group No. AS/NZS3837	Group No AS ISO9705.
Muse Printed (to be assessed)	100% PET (68% recycled)	9 mm	1.79	-	-
Muse	100% PET (68% recycled)	9 mm	1.95	3	1
Muse Tile	100% PET (68% recycled)	9 mm	1.69	3	-
Muse Tile Print	100% PET (68% recycled)	9 mm	1.98	3	-

\* As measured from samples submitted to BRANZ

#### 3.1 AS ISO 9705 test

The product known as Muse was tested by Exova Warrington in the ISO room in accordance with AS ISO 9705 and reported in Report No. 56751500.2 with a Group Number of 1 and a SMOGRA of 0.4 m<sup>2</sup>s<sup>-2</sup> x 1000. In achieving this result, the total HRR including that of the burner peaked marginally over 400 kW when the burner output was increased to 300 kW and thereafter remained below 400 kW for the majority of the test.

#### 3.2 Cone Calorimeter testing

The Muse product was also tested in accordance with AS/NZS 3837 in the cone calorimeter with a peak HRR of approximately 662 kW/m<sup>2</sup> at 100 seconds exposure for a Group 3 result.

The two other similar products (Muse Tile and Muse Tile Print) were also tested in accordance with AS/NZS 3837 in the cone calorimeter with peak HRR ranging from 465 to 590 kW/m<sup>2</sup> at approximately 100 seconds exposure also for a Group 3 result.

A commonly used parameter to ensure consistency between three replicate samples is the Average Heat Release at 180 seconds and the level of acceptability is that this does not vary by more than 10% from the mean. Using the same criteria to compare the three variation of Muse the results are presented in Table 2 showing that individual samples meet the acceptance criteria, demonstrating a level of consistency of performance of the three tested products.



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**Table 2: Heat release rate**

<b>Specimen ID</b>	<b>Average HRR over 180 s from ignition</b>	<b>Arithmetic mean</b>	<b>% difference from the arithmetic mean</b>
Muse	180	175	2.88%
Muse Tile	187.3		7.05%
Muse Tile Print	157.6		-9.93%

Referring back to Table 1 and comparing the cone test results with the weights of each product in kg/m<sup>2</sup>, the Muse Printed that is the subject of this assessment is within the weight range of the products that have been tested. On the basis that the fuel load is essentially proportional to the weight then all the listed products would be expected to perform similarly, therefore Muse printed is also likely to be classified as Group 3 if tested in accordance with AS/NZS 3837.

### 3.3 Assessment of Muse Printed for AS ISO 9705

On the basis that the three products that were tested in the cone calorimeter showed a level of consistency for a Group 3 classification and one of them (Muse) additionally achieved a Group 1 classification when tested to AS ISO 9705 then the likely performance of Muse Printed can be considered.

Since Muse Printed is the same thickness and lower than the average weight of the samples submitted, 1.79 kg/m<sup>2</sup> compared with 1.85 kg/m<sup>2</sup> average and also it is considered that it would achieve a Group 1 classification with a SMOGRA less than 100 m<sup>2</sup>s<sup>-2</sup> x 1000 when tested to AS ISO 9705.

### 3.4 Application of test and assessment results to New Zealand

The test results and Group Number Classification have been determined in accordance with the NCC BCA. In the case of the test to AS ISO 9705 -2003 this fortunately can be directly translated to the same Group 1 result in accordance with ISO 9705: 1993 the test method used in New Zealand because they are identical methods. The only difference is in the expression of the smoke production and it is evident that the Average Smoke Product Rate is also well below the 5 m<sup>2</sup>s<sup>-1</sup> also, so the Classification is considered to be Group 1-S.

For the cone calorimeter test results the test standard accepted in New Zealand is ISO 5660-1 Parts 1 and 2 and the principal difference is that data is required to be collected for a longer period possibly up to 30 minutes. Reviewing the test results for the three products tested to AS/NZS 3837 it is apparent that the HRR drops to a low level approaching zero after 300 to 700 seconds and beyond 700 seconds data recording was stopped and the Group No. calculated as Group 3. It is considered unlikely that any increase in HRR would have occurred after that, had the tests continued to 30 minutes, so the same Group 3 result would have been calculated.

It therefore follows that this assessment is equally applicable to New Zealand and will comply with New Zealand Building Code Group 1-S Classification in Accordance with C/VM2, New Zealand Building Code Clauses C1-C6.



## 4. CONCLUSION

It is considered that the Muse Printed product in 9 mm thickness when tested in accordance with AS ISO 9705 or ISO 9705 would achieve the following classifications.

- Building Code of Australia Group 1 Classification, with Smoke Growth Rate Index (SMOGRARC) less than 100 ( $\text{m}^2/\text{s}^2 \times 1000$ ), in accordance with BCA Specification C1.10.
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