
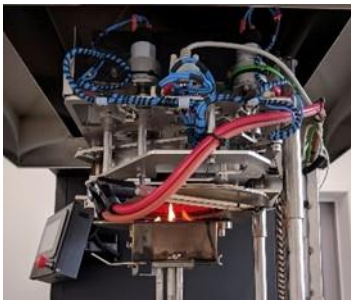


BRANZ Type Test

FH06171-002

CONE CALORIMETER TEST AND NZBC VERIFICATION METHOD C/VM2 APPENDIX A OF PSL EZYPLAST ON PLASTERBOARD

CLIENT

Resene Construction Systems
5 Venture Place,
Middleton
Christchurch, 8024
New Zealand

ilac-MRA IANZ ACCREDITED LABORATORY

All tests and procedures reported herein, unless indicated, have been performed in accordance with the laboratory's scope of accreditation

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TEST SUMMARY

Objective

To conduct cone calorimeter testing and reduce the data in accordance with ISO 5660 on client supplied specimens for the purposes of determination of the Group Classifications in accordance with New Zealand Building Code (NZBC) Verification Method C/VM2 Appendix A.

Test sponsor

Resene Construction Systems
5 Venture Place,
Middleton
Christchurch, 8024
New Zealand

Description of test specimen

The products as described by the client as PSL Ezyplast on 10 mm plasterboard substrate.

Date of tests

28 February and 11 May 2018

Test results

For the purposes of compliance with the relevant building code documents, the following classification is considered applicable to the tested samples as described in Section 1.

Building Code Document	Group Number Classification
NZBC Verification Method C/VM2 Appendix A	1-S

LIMITATION

The results reported here relate only to the item/s tested.

TERMS AND CONDITIONS

This report is issued in accordance with the Terms and Conditions as detailed and agreed in the BRANZ Services Agreement for this work.

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(ii) accepts, for its own purposes, endorsed* certificates or reports issued by organisations accredited by other signatories on the same basis as it accepts endorsed* certificates or reports issued by its own accredited organisations,

(iii) recommends and promotes the acceptance by users in its economy of endorsed* certificates and reports,

* *The word "endorsed" means a certificate or report bearing an Arrangement signatory's accreditation symbol (or mark) preferably combined with the ILAC-MRA Mark.*

Signed:

Jennifer Evans
NATA CEO

Date: 24 March 2014

Dr Llewellyn Richards
IANZ CEO

Date: 24th March 2014

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DOCUMENT REVISION STATUS

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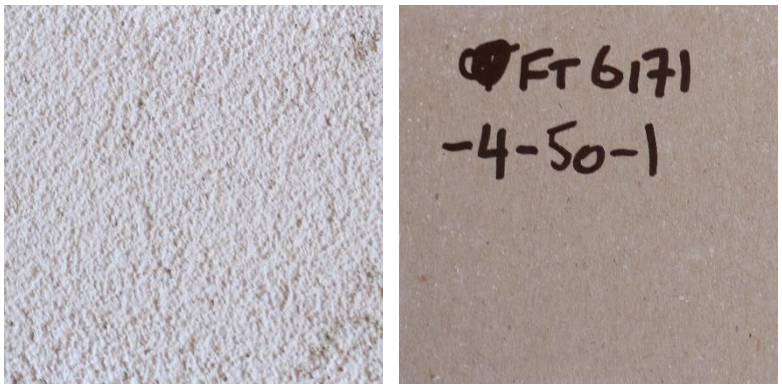
1. GENERAL

The product submitted by the client for testing was identified by the client as PSL Ezyplast on 10 mm plasterboard substrate. Figure 1 illustrates representative specimens of those tested.

Figure 1: Representative specimen (front face on left, back face on right)



1.1 Sample measurements

The following physical parameters were measured for each specimen prior to testing.

Table 1: Physical parameters

Specimen ID	Initial properties		Overall apparent density (kg/m³)	Colour
	Mass (g)	Mean thickness (mm)		
FH6171-4-50-1	90.1	11.6	777	White
FH6171-4-50-2	90.7	11.5	789	White
FH6171-4-50-3	91.6	11.6	790	White

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2. EXPERIMENTAL PROCEDURE

2.1 Test standard

The tests were carried out and data reduced according to the test procedures described in ISO 5660: (2002), Reaction-to-fire tests – Heat release, smoke production and mass loss – Part 1: Heat release rate, and Part 2: Smoke production rate; (the test standard). The sample preparation and test procedure were as described in 2.4 and 2.5.

2.2 Test date

The tests were conducted on 28 February and 11 May 2018 by Mr Lukas Hersche at BRANZ Limited laboratories, Judgeford, New Zealand.

2.3 Specimen conditioning

All specimens were conditioned to moisture equilibrium (constant weight), at a temperature of 23 ± 2°C and a relative humidity of 50 ± 5% immediately prior to testing.

2.4 Specimen wrapping and preparation

All tests were conducted and the specimens prepared in accordance with the test standard. The spark igniter and the stainless-steel retainer frame were used. All specimens were wrapped in a single layer of aluminium foil, covering the unexposed surfaces.

2.5 Test programme

The test program consisted of three replicates as identified in Table 1, tested at an irradiance level of 50 kW/m². All tests were carried out with the specimen horizontal, and with a nominal duct flow rate of 0.024 m³/s.

2.6 Specimen selection

BRANZ was not involved in the selection of the materials submitted for testing. The test materials used were supplied to the laboratory by the client.

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3. TEST RESULTS AND REDUCED DATA

3.1 Test results and reduced data – ISO 5660

Table 2: Test results and reduced data – ISO 5660

Material		Test specimens as described in Section 1 (in accordance with ISO 5660)			Mean
Specimen test number		FH6171-4-50-1	FH6171-4-50-2	FH6171-4-50-3	
Test Date		28/02/2018	11/05/2018	11/05/2018	
Time to sustained flaming	s	0	80	0	27
Observations[a]		-	-	-	
Test duration[b]	s	1800**	1562*	1800**	1721
Mass remaining, m_f	g	71.9	72.5	73.5	72.6
Mass pyrolyzed	%	20.2%	20.1%	19.8%	20.0%
Specimen mass loss[c]	kg/m^2	2.1	1.9	2.1	2.0
Specimen mass loss rate[c]	g/m^2 .s	2.1	1.9	2.2	2.1
Heat release rate					
peak, $\dot{q}''_{\max}$	kW/m^2	15.7	14.4	13.9	14.6
average, $\dot{q}''_{avg}$					
Over 60 s from ignition	kW/m^2	-0.3	11.6	-0.9	3.5
Over 180 s from ignition	kW/m^2	6.2	8.7	5.8	6.9
Over 300 s from ignition	kW/m^2	6.3	6.0	5.6	6.0
Total heat released	MJ/m^2	5.9	4.4	5.3	5.2
Average Specific Extinction Area	m^2/kg	-9.7	10.9	18.4	6.5
Effective heat of combustion[d], $\Delta h_{c,eff}$	MJ/kg	2.9	2.1	2.6	2.5

Notes:

[a] no significant observations were recorded

[b] determined by * X_{O2} returning to the pre-test value within 100 ppm of oxygen concentration for 10 minutes
** 30 minutes after time to sustained flaming or without ignition

[c] from ignition to end of test;

[d] from the start of the test

[+] value calculated using data beyond the official end of test time according to the test standard.

NR not recorded

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4. SUMMARY

The test standard requires the mean heat release rate (HRR) readings over the first 180 s from ignition for the three specimens should differ by no more than 10% of the arithmetic mean of the three readings. In the event of this criterion not being met, a further three specimens are required to be tested.

Table 3: Heat release rate

Specimen ID	Average HRR over 180 s from ignition	Arithmetic mean	% difference from the arithmetic mean
FH6171-4-50-1	6.2	6.9	-10.0%
FH6171-4-50-2	8.7		25.8%
FH6171-4-50-3	5.8		-15.8%

Table 4 identifies two of the specimens exposed to 50 kW/m² irradiance exceeded the acceptance criteria. Although two of the specimens were outside of the variability criteria of the test standard, the same Group Classification was determined for each specimen. A further set of three tests as required by the test standard was deemed not to be necessary and would not be expected to lead to an alteration of the classification.

The report summary for the specimens as described in Section 1, exposed to an irradiance of 50 kW/m² is given in Table 4 below with rates of heat release illustrated in Figure 2.

Table 4: Report summary

Mean Specimen thickness (mm)	Irradiance (kW/m²)	Mean Time to Ignition (s)	Mean Peak Heat Release Rate (kW/m²)	Mean Average Specific Extinction Area (m²/kg)
11.6	50	27	14.6	14.7

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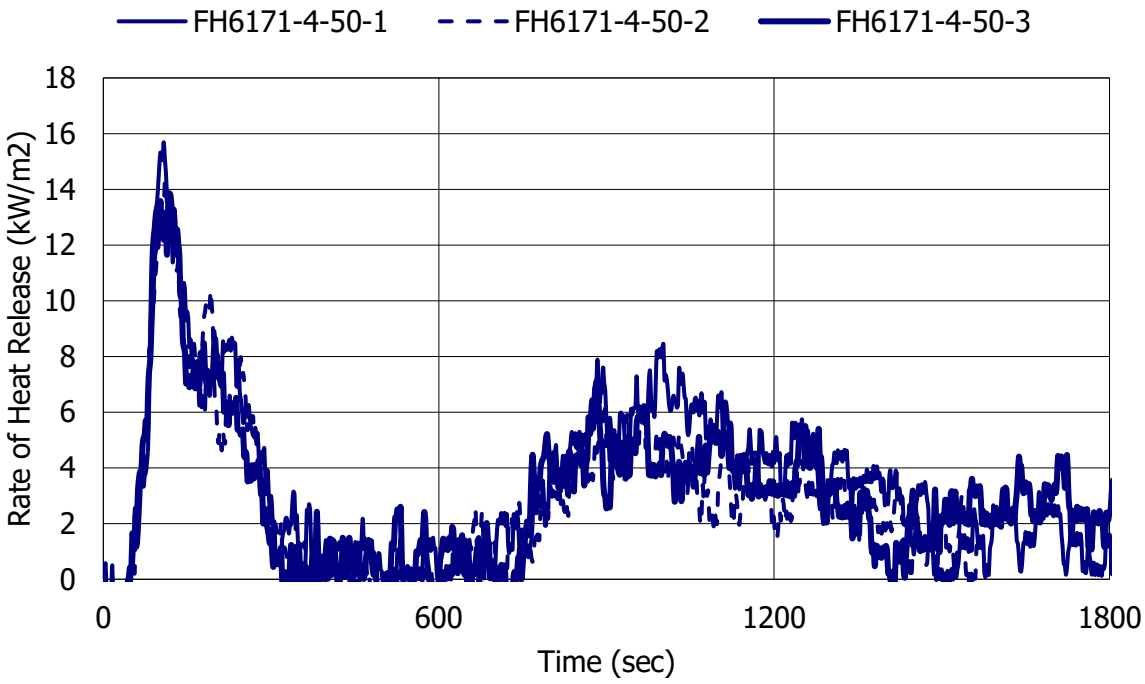
Figure 2: Rate of heat release versus time



5. DETERMINATION OF NZBC GROUP CLASSIFICATION

The following classification has been assessed in accordance with the New Zealand Building Code Verification Method C/VM2 Appendix A: Establishing Group Numbers for lining materials. Calculations were carried out according to section A1.3 for predicting a material's group number for each specimen tested. It states that "If a different classification group is obtained for different specimens tested, then the highest (worst) classification for any specimen must be taken as the final classification for that material." The classification for the specimens as described in Section 1 is as follows:

Table 5: NZBC Group classification and smoke extinction area

	Sample 1	Sample 2	Sample 3	Classification
Group number Classification	1	1	1	1-S
Average Specific Extinction Area (m^2/kg)	-9.7	10.9	18.4	

In accordance with Verification Method C/VM2 Appendix A, samples achieving either a Group number classification 1 or 2, and with an average specific extinction area less than 250 m^2/kg are identified with "S" post-script to the Group number. The tested samples recorded an average specific extinction area of 6.5 m^2/kg which is less than the 250 m^2/kg limit.

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6. NZBC CONCLUSION

The cone calorimeter testing was carried out on the specimens as described in Section 1. For the purposes of compliance with the NZBC Verification Method C/VM2 Appendix A, the following classification is considered applicable to the material as described in Section 1.

Group Number Classification	**1-S**

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FH06171-002
GROUP NUMBER CLASSIFICATION

This is to certify that the specimens described below were tested by BRANZ for determination of Group Number Classification and Average Specific Extinction Area in accordance with ISO 5660 Parts 1 and 2.

Test Sponsor

Resene Construction Systems
5 Venture Place,
Middleton
Christchurch, 8024
New Zealand

Date of tests

28 February and 11 May 2018

Reference BRANZ Test Report

FH06171-002 – issued 8/06/2018

Test specimens as described by the client

PSL Ezyplast

An internal surface finish applied to a 10 mm plasterboard substrate.

Specimen Reference	Mass (g)	Thickness (mm)	Apparent Density (kg/m³)	Colour
FH6171-4-50-1	90.1	11.6	777	White
FH6171-4-50-2	90.7	11.5	789	White
FH6171-4-50-3	91.6	11.6	790	White

Group Number Classification in accordance with the New Zealand Building Code

Calculations were carried out according to NZBC Verification Method C/VM2 Appendix A. The classification for the sample as described above is given in the table below.

Building Code Document	Group Number Classification
NZBC Verification Method C/VM2 Appendix A	1-S

Issued by

Lukas Hersche
Fire Testing Engineer
BRANZ

Reviewed by

PCR Collier

Peter Collier
Senior Fire Testing Engineer
IANZ Approved Signatory

Regulatory authorities are advised to examine test reports before approving any product.

All tests and procedures reported herein, unless indicated, have been performed in accordance with the laboratory's scope of accreditation

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8/06/2018

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