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FIRE TEST REPORT

FH5778

CONE CALORIMETER TEST NCC SPECIFICATION C1.10 PERFORMANCE OF STO-SILENT ACOUSTIC PANEL

CLIENT

Sto Plaster Systems (STOANZ)
72 Abel Smith Street
Ground Level
Te Aro
Wellington 6011
New Zealand



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 AS/NZS 3837 on client supplied specimens for the purposes of determination of the Group Classifications in accordance with;

- National Construction Code (NCC) Volume One Specifications C1.10 and A 2.4 of the Building Code of Australia (BCA).

Test sponsor

Sto Plaster Systems (STOANZ)
72 Abel Smith Street
Ground Level
Te Aro
Wellington 6011
New Zealand

Description of test specimen

The product submitted by the client for testing was identified by the client as StoSilent Acoustic Panel.

Date of test

9th May 2012

Test results

For the purposes of compliance with the respective building code documents, the following classification is considered applicable to both of the materials as described in Section 1, and others in the same product range with the same fabrication, weight and thickness as the products tested.

Building Code Document	Group Number Classification
NCC Specifications C1.10 and A 2.4	1 The average specific extinction area was less than the 250 m ² /kg limit.

LIMITATION

The results reported here relate only to the items 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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- (i) recognises within its scope of recognition of this Arrangement the accreditation of an organisation by other signatories as being equivalent to an accreditation by its own organisation,
- (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,
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Signed:


Jennifer Evans
NATA CEO


Dr Llewellyn Richards
IANZ CEO

Date: 24 March 2014

Date: 24th March 2014



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1. GENERAL

The product submitted by the client for a full test was identified by the client as StoSilent Acoustic Panel comprising 96% recycled glass in an epoxy resin. Figure 1 illustrates a representative specimen of those tested.

Figure 1 Representative specimen (back face - left, exposed face - middle, detail - 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/m ³)
	Mass* (g)	Mean thickness* (mm)	
FH4892-50-1	80.2	16.6	483
FH4892-50-2	86.1	17.4	495
FH4892-50-3	83.6	17.2	486

*The test specimens of which these results were previously reported to a different test standard are used in this report for consideration to NCC, BCA requirements.

2. EXPERIMENTAL PROCEDURE

2.1 Test standard

The tests were carried out 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 9th May 2012 by Mr Paul Wong at BRANZ Limited laboratories, Judgeford, New Zealand.

2.3 Specimen conditioning

All specimens were conditioned to moisture equilibrium (constant weight), at a temperature of $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $50 \pm 5\%$ 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 replicate specimens as identified in the above table, tested at an irradiance level of 50 kW/m^2 . All tests were carried out with the specimen horizontal, and with a nominal duct flow rate of $0.024 \text{ m}^3/\text{s}$.



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PCRC

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PNW

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3. TEST RESULTS AND REDUCED DATA

3.1 Test results and reduced data – NCC C1.10

Table 2: Test results and reduced data – NCC C1.10

Material	Test specimens as described in Section 1 (in accordance with AS/NZS 3837)			Mean
	FH4892-50-1	FH4892-50-2	FH4892-50-3	
Specimen test number	FH4892-50-1	FH4892-50-2	FH4892-50-3	
Test Date	9/05/2012	9/05/2012	9/05/2012	
Time to sustained flaming s	44	52	53	50
Observations ^a	-	-	-	
Test duration ^b s	203**	218**	204**	208
Mass remaining, m _f g	77.4	83.5	81.0	80.6
Mass pyrolyzed %	3.5%	3.1%	3.1%	3.2%
Specimen mass loss ^c kg/m ²	0.3	0.3	0.2	0.3
Specimen mass loss rate ^c g/m ² .s	5.1	4.5	4.0	4.5
Heat release rate				
peak, \dot{q}''_{max} kW/m ²	45.0	34.5	30.0	36.5
average, \dot{q}''_{avg}				
Over 60 s from ignition kW/m ²	31.6	27.9	23.5	27.7
Over 180 s from ignition kW/m ²	20.8	19.3	17.5	19.2
Over 300 s from ignition kW/m ²	17.9	16.5	15.5	16.6
Total heat released MJ/m ²	3.5	3.4	2.9	3.2
Average Specific Extinction Area m ² /kg	23.9	9.9	29.9	21.2
Effective heat of combustion ^d , $\Delta h_{c,eff}$ MJ/kg	11.0	11.2	9.7	10.7

Notes :

^a no significant observations were recorded

^b determined by

* average mass loss over 1 minute dropped below 150 g/m²

** two minutes after flameout or other signs of combustion cease

*** 60 minutes have elapsed or 10 minutes 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 that 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 180s from ignition	Arithmetic mean	% difference from the arithmetic mean
FH4892-50-1	20.8	19.2	8.2%
FH4892-50-2	19.3		0.7%
FH4892-50-3	17.5		-8.9%

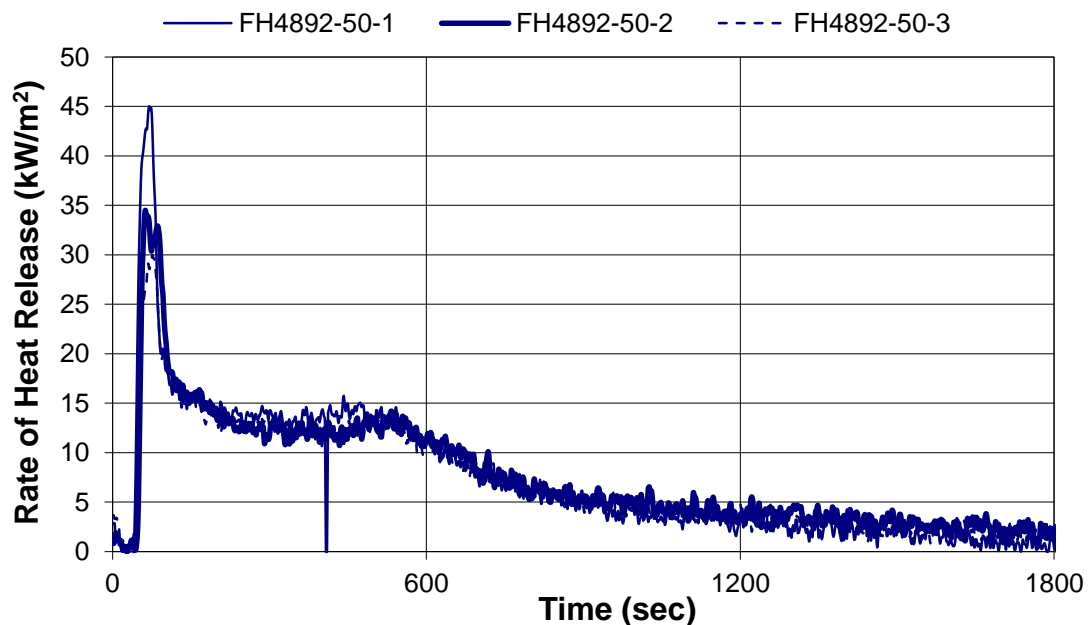
The above table identifies all three of the specimens exposed to 50 kW/m² irradiance were within the acceptance criteria.

The report summary for the specimens as described in Section 1, exposed to an irradiance of 50 kW/m² is:

Table 4: Report summary

Mean Specimen thickness (mm)	Irradiance (kW/m ²)	Mean Time to Ignition (s)	Mean Peak Heat Release Rate (kW/m ²)	Average Specific Extinction Area (m ² /kg)
17.1	50	50	36.5	21.2

Figure 2 Rate of heat release verses time



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5. CLASSIFICATION IN ACCORDANCE WITH NCC VOLUME ONE SPECIFICATION C1.10

Calculations were carried out according to Specification A2.4. The classification and for smoke extinction area for the sample as described in Section 1 is as follows:

Table 5: NCC Group classification and smoke extinction area

	Specimen 1	Specimen 2	Specimen 3	Classification
Group number Classification	1	1	1	1
Average Specific Extinction Area (m ² /kg)	23.9	9.9	29.9	

The tested samples recorded an average specific extinction area of 21.2 m²/kg which is less than the 250 m²/kg limit and therefore it may be used in buildings with or without a sprinkler system complying with Specification E1.5 in accordance with Specification C1.10 Table 2.

6. NCC CONCLUSION

The cone calorimeter testing was carried out on the specimens as described in Section 1. For the purposes of compliance with the NCC Volume One Specification C1.10 for the Classification of Fire Performance of Wall and Ceiling Lining Materials, the following classification is considered applicable to the material as described in Section 1.

Group Number Classification	1
The average specific extinction area was less than the 250 m ² /kg limit.	



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