

BRANZ **Type Test**

FH 5717 Issue 2

CONE CALORIMETER TEST OF ROCKCOTE MARRAKESH OVER RESENE QUICKDRY

CLIENT

Rockcote Resene Ltd
T/A Resene Construction Systems
10B Abros Place
Burnside
Christchurch, 8053
New Zealand



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 Parts 1 and 2
- AS 5637.1

Test sponsor

Rockcote Resene Ltd
T/A Resene Construction Systems
10B Abros Place
Burnside
Christchurch, 8053
New Zealand

Description of test specimen

The product as described by the client as Rockcote Marrakesh over Resene Quickdry on a standard grade plaster board substrate.

Date of tests

17 and 23 April 2015

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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- (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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SIGNATORIES



Author

L. F. Hersche
Fire Testing Engineer
IANZ Approved Signatory



Reviewer

S. Whatham
Fire Testing Engineer
BRANZ

DOCUMENT REVISION STATUS

ISSUE NO.	DATE ISSUED	EXPIRY DATE	DESCRIPTION
1	7 May 2015	7 May 2020	Initial issue
2	30 August 2021	30 August 2026	Revalidation for another 5 years Addition of Section 3 Smoke Production (BRANZ Ref: FH14131)



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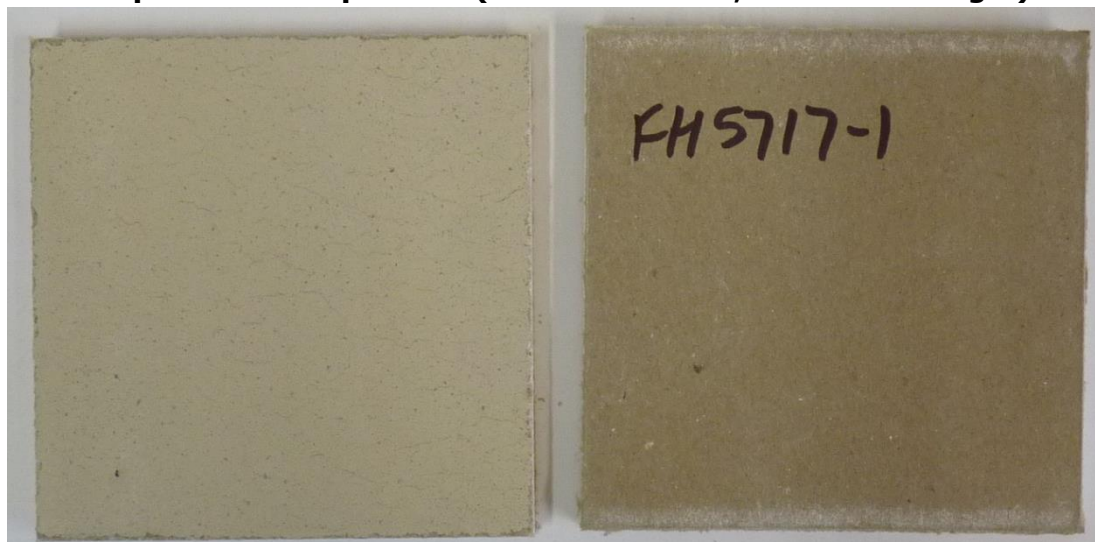
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1. GENERAL

The product submitted for testing was identified by the client as Rockcote Marrakesh over Resene Quickdry on a standard grade plaster board substrate. Figure 1 illustrates a representative specimen of that 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/m ³)
	Mass (g)	Mean thickness (mm)	
FH5717-1-50-1	77.6	11.0	705
FH5717-1-50-2	76.9	11.0	699
FH5717-1-50-3	78.2	11.1	705

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, and AS/NZS 3837:1998 'Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter'; (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 17 and 23 April 2015 by Mr Matthew Van Atta 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 Table 1, 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 $0.024 \text{ m}^3/\text{s}$.

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 5660-1

Material	Test specimens as described in Section 1 (in accordance with ISO 5660)			Mean
Specimen test number	FH5717-1-50-1	FH5717-1-50-2	FH5717-1-50-3	
Test Date	17/04/2015	23/04/2015	23/04/2015	
Time to sustained flaming	s	74	68	71
Observations ^a	-	-	-	
Test duration ^b	s	1256*	1648*	1412
Mass remaining, m_f	g	62.5	61.8	61.1
Mass pyrolyzed	%	19.5%	19.7%	21.3%
Specimen mass loss ^c	kg/m ²	1.5	1.6	1.7
Specimen mass loss rate ^c	g/m ² .s	1.3	1.0	1.3
Heat release rate				
peak, \dot{q}''_{max}	kW/m ²	51.1	73.8	68.2
average, \dot{q}''_{avg}				
Over 60 s from ignition	kW/m ²	26.9	35.9	34.0
Over 180 s from ignition	kW/m ²	14.3	17.6	16.7
Over 300 s from ignition	kW/m ²	10.5	12.9	12.2
Total heat released	MJ/m ²	6.8	7.9	7.5
Average Specific Extinction Area	m ² /kg	22.1	23.6	17.8
Effective heat of combustion ^d , $\Delta h_{c,eff}$	MJ/kg	4.0	4.6	4.1

Notes:

^a no significant observations were recorded

^b determined by * X_{O_2} 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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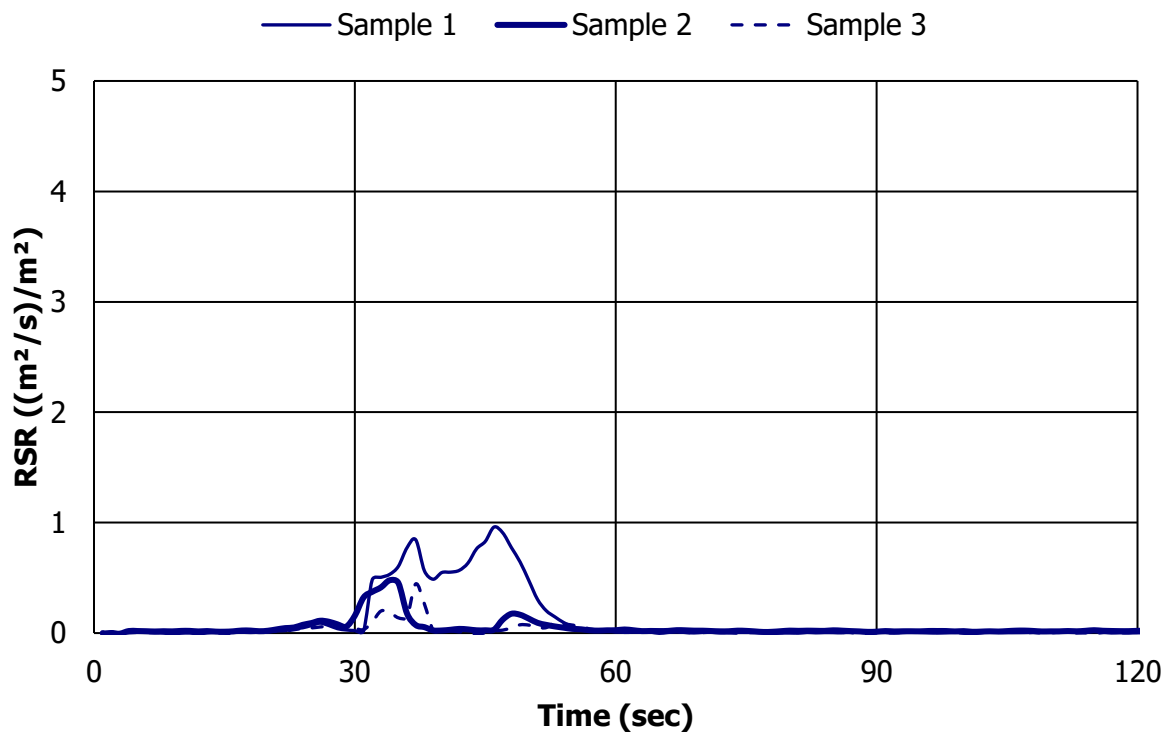
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Table 3: Smoke production per unit area – ISO 5660-2

Specimen number	FH5717-1-50-1	FH5717-1-50-2	FH5717-1-50-3
Total smoke production per unit area before ignition ($S_{A,1}$) (m ² /m ²)	4.85	3.13	8.41
Total smoke production per unit area after ignition ($S_{A,2}$) (m ² /m ²)	14.09	17.09	0.00
Total smoke production per unit area (S_A) (m ² /m ²)	18.94	20.22	8.41
Exposed surface area (A) (m)	0.00884		

Figure 2: Smoke production rate normalised to the specimen area



3.2 Test results and reduced data – AS/NZS 3837

Table 4: Test results and reduced data – AS/NZS 3837

Material	Test specimens as described in Section 1 (in accordance with AS/NZS 3837)			Mean	
	Specimen test number	FH5717-1-50-1	FH5717-1-50-2		FH5717-1-50-3
Specimen test number		FH5717-1-50-1	FH5717-1-50-2	FH5717-1-50-3	
Test Date		17/04/2015	23/04/2015	23/04/2015	
Time to sustained flaming	s	74	68	71	71
Observations ^a		-	-	-	
Test duration ^b	s	288*	224**	288*	267
Mass remaining, m _f	g	69.5	71.8	68.9	70.1
Mass pyrolyzed	%	10.4%	6.6%	11.9%	9.6%
Specimen mass loss ^c	kg/m ²	0.7	0.5	0.9	0.7
Specimen mass loss rate ^c	g/m ² .s	5.0	4.4	5.7	5.0
Heat release rate					
peak, \dot{q}_{max}''	kW/m ²	51.1	73.8	79.8	68.2
average, \dot{q}_{avg}''					
Over 60 s from ignition	kW/m ²	26.9	35.9	39.1	34.0
Over 180 s from ignition	kW/m ²	14.3	17.6	18.3	16.7
Over 300 s from ignition	kW/m ²	10.5	12.9	13.3	12.2
Total heat released	MJ/m ²	3.2	3.2	3.8	3.4
Average Specific Extinction Area	m ² /kg	31.2	19.9	6.6	19.2
Effective heat of combustion ^d , $\Delta h_{c,eff}$	MJ/kg	3.4	5.6	3.6	4.2

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. HEAT RELEASE RATE SUMMARY

The test standards require that the mean heat release rate (HRR) readings over the first 180s 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 5: Heat release rate

Specimen ID	Average HRR over 180s from ignition	Arithmetic mean	% Difference from the arithmetic mean
FH5717-1-50-1	14.3	16.7	-14.6%
FH5717-1-50-2	17.6		5.2%
FH5717-1-50-3	18.3		9.4%

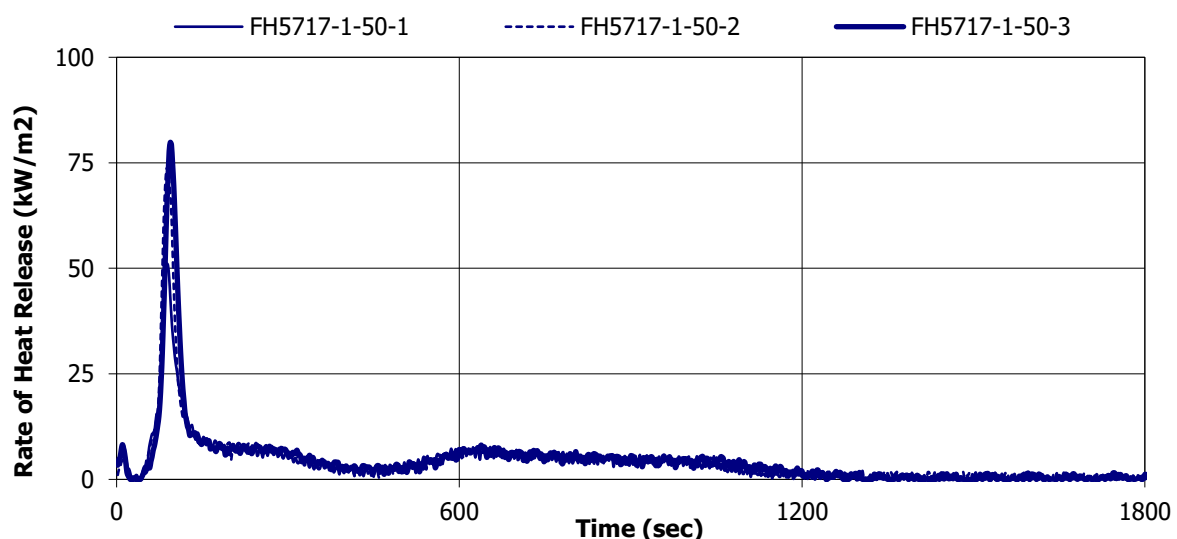
Table 5 identifies that the specimens exposed to 50 kW/m² exceeded the acceptance criteria. Although one of the specimens were outside of the variability criteria of the test standard a further set of three tests as required by the test standard was deemed not to be necessary and would not be expected 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 below with rates of heat release illustrated in Figure 3.

Table 6: Report summary

Mean Specimen thickness (mm)	Irradiance (kW/m ²)	Mean Time to Ignition (s)	Mean Peak Heat Release Rate (kW/m ²)	Mean Average Specific Extinction Area (m ² /kg)
11.0	50	71	68.2	17.8 (ISO) 19.2 (AS)

Figure 3: Rate of heat release versus time



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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 and AS/NZS 3837.

Test Sponsor

Rockcote Resene Ltd
T/A Resene Construction Systems
10B Abros Place
Burnside
Christchurch, 8053
New Zealand

Date of tests

17 and 23 April 2015

Reference BRANZ Test Report

FH 5717 Issue 2 – 30 August 2021

Test specimens as described by the client

Rockcote Marrakesh over Resene Quickdry on a standard grade plaster board substrate.

Specimen ID	Mass (g)	Thickness (mm)	Apparent Density (kg/m ³)	Colour
FH5717-1-50-1	77.6	11.0	705	White
FH5717-1-50-2	76.9	11.0	699	
FH5717-1-50-3	78.2	11.1	705	

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.

Group Number Classification in accordance with NCC Australia

Calculations were carried out according to AS 5637.1:2015. The Group Number Classification and Average Smoke Extinction Area for the sample as described above is given in the table below.

Determination of Fire Hazard Properties

The specimen was deemed suitable for testing in accordance with AS 5637.1:2015 and testing was performed in accordance with AS/NZS 3837 for the purposes of Group Number Classification as specified in the NCC Volume One Specification C1.10 Clause 4.

Building Code Document	Group Number Classification
NZBC Verification Method C/VM2 Appendix A	1-S
NCC Volume One Specification C1.10 Clause 4 determined in accordance with AS 5637.1:2015	1 The average specific extinction area was less than the 250 m ² /kg limit

Issued by

L. F. Hersche
Fire Testing Engineer
IANZ Approved Signatory

Reviewed by

S. Whatham
Fire Testing Engineer
BRANZ

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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