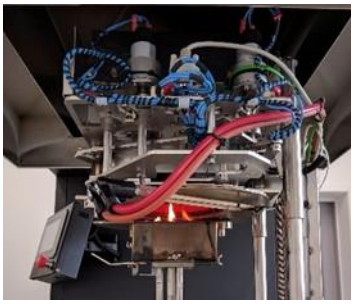




BRANZ Type Test

FH 5458 Issue 2

CONE CALORIMETER TEST OF RESENE QUICK DRY ON STANDARD PAPER-FACED PLASTERBOARD

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

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

TEST SUMMARY

Objective

To conduct cone calorimeter testing and reduce the data in accordance with:

- ISO 5660 Parts 1 and 2

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 MultiStop Finishing Application with Resene Aquapel", "Typical Rockcote Multistop Finishing Application", "Typical Rockcote Milano Application" and "Typical Rockcote Earthen Application".

Date of tests

11, 17, and 18 February 2014

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.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

CONTENTS

FIGURES

TABLES

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

SIGNATORIES

Author

L. F. Hersche
Fire Testing Engineer
IANZ Approved Signatory

Reviewer

S. Whatham
Fire Testing Engineer
BRANZ

DOCUMENT REVISION STATUS

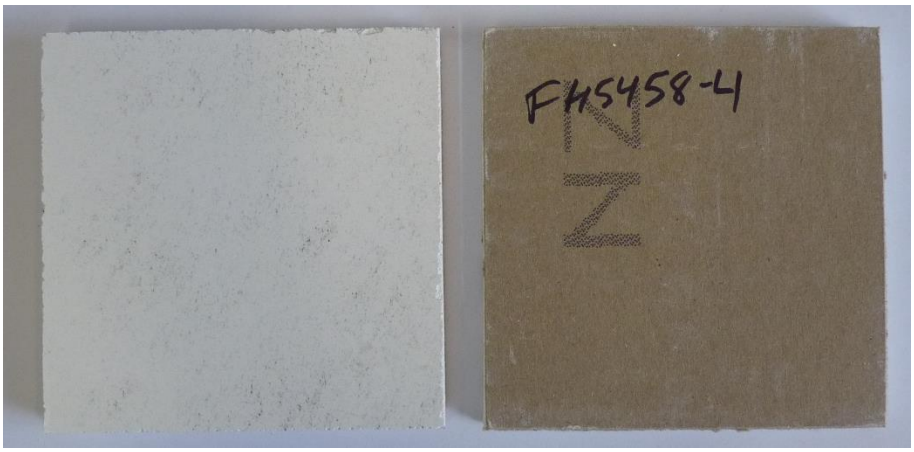
ISSUE NO.	DATE ISSUED	EXPIRY DATE	DESCRIPTION
1	13 June 2014	13 June 2019	Initial issue
2	30 August 2021	30 August 2026	Revalidation for another 5 years Addition of Section 3.2 Smoke production per unit area (BRANZ Ref: FH14131)

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

1. GENERAL

The product submitted for testing was identified by the client as Typical Rockcote Earthen Application comprising Resene Quick Dry with some clay mixed in and two coats of Rockcote Earthen Decor on a standard paper-faced plasterboard 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/m³)	Colour
	Mass* (g)	Mean thickness* (mm)		
FH5458-4-50-1	82.0	11.1	739	White
FH5458-4-50-2	82.2	11.1	741	White
FH5458-4-50-3	82.3	11.1	741	White

*includes nominally 10 mm thick paper faced plasterboard substrate

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

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 sample preparation and test procedure were as described in 2.4 and 2.5.

2.2 Test date

The tests were conducted on 11, 17, and 18 February 2014 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 $\pm$ 2°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 and three indicative specimens 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.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

3. TEST RESULTS AND REDUCED DATA

3.1 Test results and reduced data

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		FH5458-4-50-1	FH5458-4-50-2	FH5458-4-50-3	
Time to sustained flaming	s	61	64	65	63
Observations[a]		-	-	-	
Test duration[b]	s	1748*	926*	1794*	1489
Mass remaining, m_f	g	64.2	64.6	66.0	64.9
Mass pyrolyzed	%	21.7%	21.5%	19.8%	21.0%
Specimen mass loss[c]	kg/m^2	1.9	1.9	1.8	1.9
Specimen mass loss rate[c]	g/m^2 .s	1.1	1.1	1.0	1.0
Heat release rate					
peak, $\dot{q}''_{\max}$	kW/m^2	125.4	142.9	135.0	134.4
average, $\dot{q}''_{avg}$					
Over 60 s from ignition	kW/m^2	63.3	62.9	63.3	63.2
Over 180 s from ignition	kW/m^2	26.9	25.8	26.9	26.5
Over 300 s from ignition	kW/m^2	18.8	17.4	18.6	18.3
Total heat released	MJ/m^2	8.9	6.7	9.2	8.3
Average Specific Extinction Area	m^2/kg	8.2	4.6	3.8	5.5
Effective heat of combustion[d], $\Delta h_{c,eff}$	MJ/kg	4.4	3.4	5.0	4.3

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

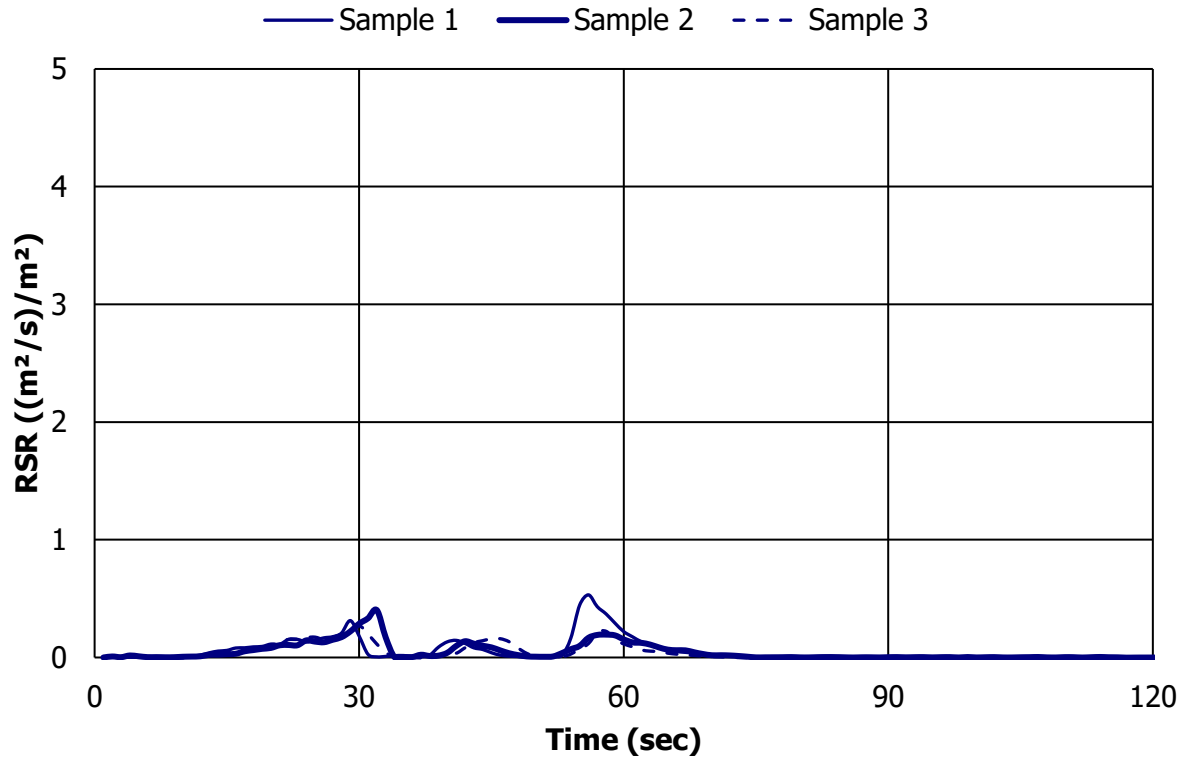
branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

3.2 Smoke production per unit area

Table 3: Test results and reduced data – ISO 5660-2

Specimen number		FH5458-4-50-1	FH5458-4-50-2	FH5458-4-50-3
Total smoke production per unit area before ignition ($S_{A,1}$)	(m^2/m^2)	8.41	2.91	3.91
Total smoke production per unit area after ignition ($S_{A,2}$)	(m^2/m^2)	0.00	2.21	0.00
Total smoke production per unit area (S_A)	(m^2/m^2)	8.41	5.12	3.91
Exposed surface area (*A*)	(m)	0.00884		

Figure 2: Smoke production rate normalised to the specimen area



branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

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 4: Heat release rate

Specimen ID	Average HRR over 180s from ignition	Arithmetic mean	% Difference from the arithmetic mean
FH5458-4-50-1	26.9	26.5	1.3%
FH5458-4-50-2	25.8		-2.9%
FH5458-4-50-3	26.9		1.6%

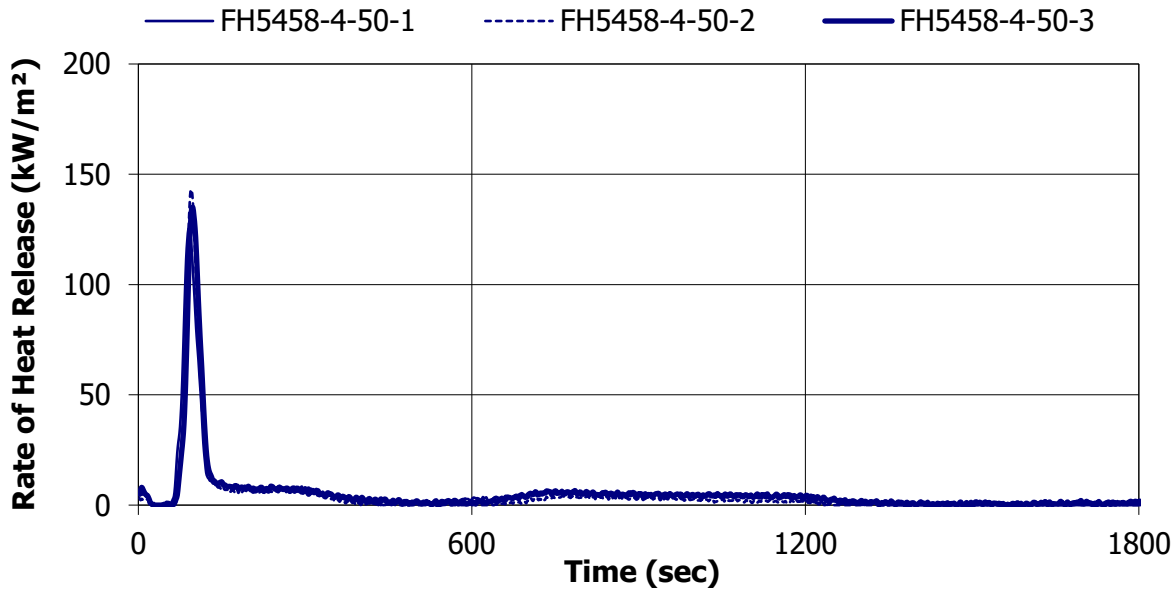
Table 4 identifies that the specimens exposed to 50 kW/m² irradiance meet the acceptance criteria.

The report summary for the specimens as described in Section 1, exposed to an irradiance of 50 kW/m² is given in Table 5 below with rates of heat release illustrated in Figure 3.

Table 5: 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)
11.1	50	63	134.4	5.5

Figure 3: Rate of heat release versus time



branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

5. DISCUSSION

Additionally, three other surfaces based on Resene Quick Dry were submitted for testing. A summary of the composition is in Table 6.

Table 6: Product Designations

Specimen ID	Designation	Composition
FH5458-1-50-1	Rockcote MultiStop Finishing Application with Resene Aquapel	Resene Quick Dry with some Rockcote MultiStop Bedding Compound mixed in 2 coats Rockcote MultiStop Finishing Compound 1 coat Resene Aquapel
FH5458-2-50-1	Typical Rockcote Multistop Finishing Application	Resene Quick Dry with some Rockcote MultiStop Bedding Compound mixed in 2 coats Rockcote MultiStop Finishing Compound
FH5458-3-50-1	Typical Rockcote Milano Application	Resene Quick Dry with some Rockcote MultiStop Bedding Compound mixed in 2 coats of Rockcote Milano MarbleStone 1 coat of Rockcote Milano Plak 1 coat of Rockcote Milano Saonada
FH5458-4-50-1	Typical Rockcote Earthen Application	Resene Quick Dry with some clay mixed in 2 coats of Rockcote Earthen Decor

Shaded row – Sample 1 results for material tested in full herein.

Prior to testing the physical parameters in Table 7 were recorded.

Table 7: Physical Parameters

Specimen ID	Weight* (g)	Thickness* (mm)	Density* (kg/m^3)
FH5458-1-50-1	84.6	10.9	776
FH5458-2-50-1	69.1	10.3	671
FH5458-3-50-1	71.8	10.5	684
FH5458-4-50-1	82.0	11.1	739

Shaded row – Sample 1 results for material tested in full herein.

*includes nominally 10 mm thick paper faced plasterboard substrate.

Samples of each type were subjected to single indicative tests to identify any possible variations.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

Table 8: Summary of Indicative Results

Ref. no	Time to Ignition (s)	Test Duration (s)	Peak Heat Release Rate (kW/m^2)	Total Heat Released (MJ/m^2)	Average Specific Extinction Area (m^2/kg)	Indicated Group No.
FH5458-1-50-1	No Ignition	1800	10.6	7.1	32.5	1-S
FH5458-2-50-1	68	1672	147.3	3.3	13.8	1-S
FH5458-3-50-1	48	1718	141.4	6.2	7.1	1-S
FH5458-4-50-1	61	1748	125.4	8.9	8.2	1-S

Shaded row – Sample 1 results for material tested in full herein.

No significant variations were detected, and each sample was designated a Group 1-S classification. As the peak heat release rate and the total heat release results are comparable to the "Typical Rockcote Earthen Application", it is considered that the "Rockcote MultiStop Finishing Application with Resene Aquapel", "Typical Rockcote Multistop Finishing Application" and "Typical Rockcote Milano Application" will retain a Group 1-S achieved by the "Typical Rockcote Earthen Application" as tested and reported herein.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

FH 5458-C1 ISSUE 2
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

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

Date of tests

11, 17, and 18 February 2014

Reference BRANZ Test Report

FH 5458 Issue 2 – 30 August 2021

Test specimens as described by the client

Resene Quick Dry systems on standard paper-faced plasterboard as follows:

- Rockcote MultiStop Finishing Application with Resene Aquapel
- Typical Rockcote Multistop Finishing Application
- Typical Rockcote Milano Application
- Typical Rockcote Earthen Application

Specimen ID	Mass (g)	Thickness (mm)	Apparent Density (kg/m³)	Colour
FH5458-1-50-1	84.6	10.9	776	White
FH5458-2-50-1	69.1	10.3	671	White
FH5458-3-50-1	71.8	10.5	684	White
FH5458-4-50-1	82.0	11.1	739	White

Shaded row – Sample 1 results for material tested in full herein

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

L. F. Hersche
Fire Testing Engineer
IANZ Approved Signatory

Issue Date
30 August 2021

Reviewed by

S. Whatham
Fire Testing Engineer
BRANZ

Expiry Date
30 August 2026

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