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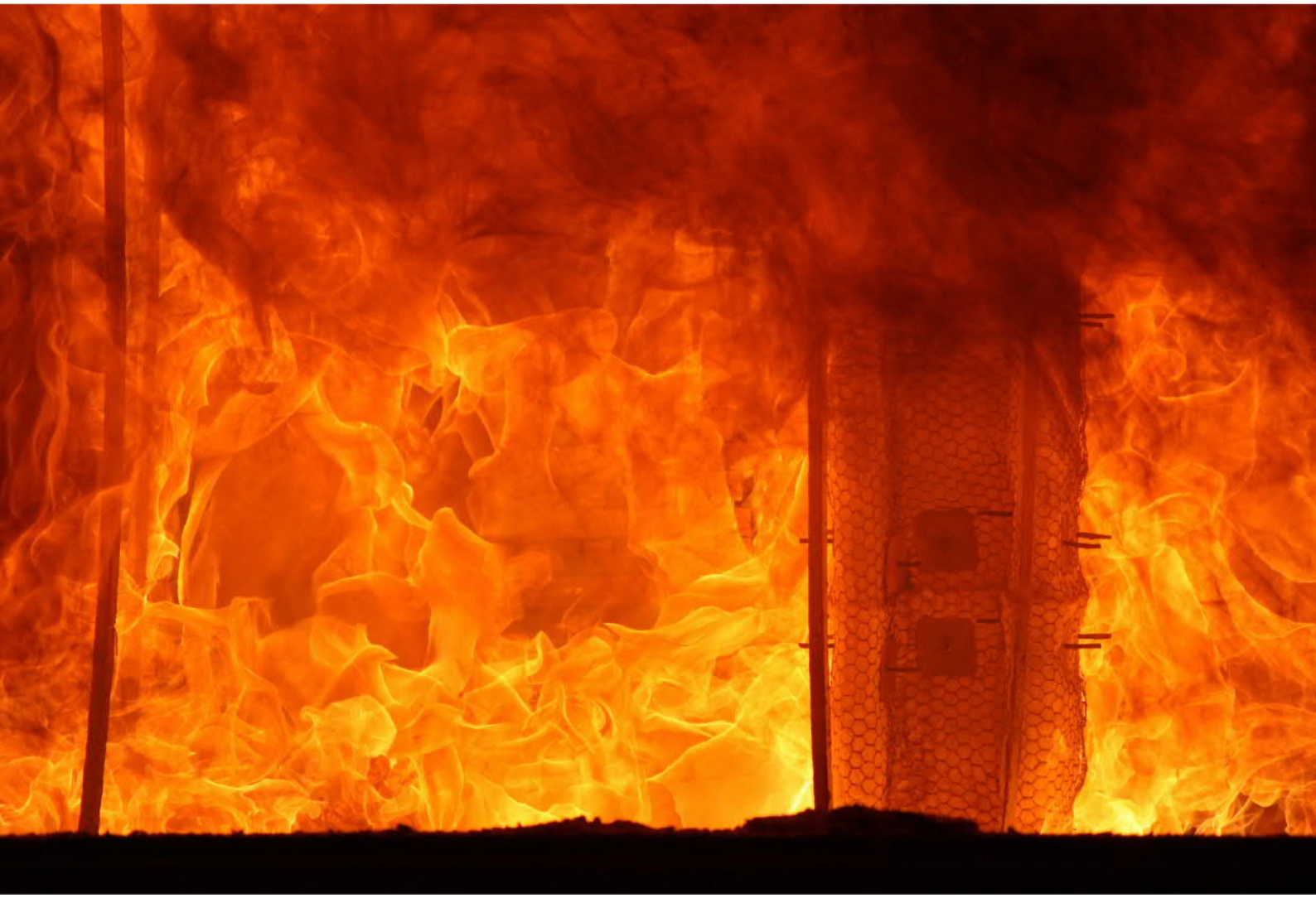

Reaction-to-fire test report

Combustibility performance of a building material in accordance with AS 1530.1:1994 (R2016)

Test sponsors: Design Central Australia Pty Ltd

The Tile People Ltd

Product: Brick to Click® (unglazed)

Job number: RTF200236

Test date: 3 August 2020 Revision: R1.0

Quality management

Version	Date	Information about the report			
R1.0	14 August 2020	Description	Initial issue.		
			Prepared by	Reviewed by	Authorised by
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		Signature			

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1. Introduction

This report documents the findings of the fire hazard properties of Brick to Click® (unglazed) tested on 3 August 2020 in accordance with AS 1530.1:1994 (R2016).

Warringtonfire Australia did the test at the request of the test sponsors listed in Table 1.

Table 1 Test sponsor details

Test sponsor	Address
Design Central Australia Pty Ltd	15 King William Road Unley SA 5061 Australia
The Tile People Ltd	Unit 4, 460 Rosebank Road Avondale Auckland 1026 New Zealand

2. Test specimen

The description of the specimen given below has been prepared from the information provided by the test sponsor, unless otherwise specified. Warringtonfire was not involved in any selection or sampling procedure but was commissioned to modify the specimens to make them meet the geometric requirements of AS 1530.1:1994 (R2016). All measurements – unless indicated – were measured by Warringtonfire Australia.

Table 2 describes the sampled product. Details of specimen geometry are summarized in Table 3.

Table 2 Product description

Item	Detail
Product	Brick to Click® (unglazed)
General description	Ceramic material which is comprised of clay, feldspar, kaolin and sand. The material (German Clinker) is extruded from a moist line of clay and is heated for approximately 50 hours at more than 1200 °C (2200 °F) in a tunnel kiln. The product was received by Warringtonfire Melbourne in its original glazed final product. Uniform discs with an average thickness of 10 mm were prepared from it, with its glaze component removed. The glaze was removed through grinding.
Photograph of specimen	
Pre-conditioning density	2,246 kg/m^3
Average density after conditioning	2,244 kg/m^3
Colour	Brick red

Table 3 Specimen geometry

Parameter	Unit	Specimen number				
		1	2	3	4	5
Diameter	mm	45.0	45.0	45.0	45.0	45.0
Height	mm	50.1	48.7	48.8	48.7	49.1
Volume	cm^3	79.7	77.5	77.6	77.5	78.1

3. Test Procedure

3.1 Procedure

The test apparatus consisted of a furnace with refractory tube surrounded by a heating coil. The furnace was enclosed in an insulated surround and mounted on a stand. It was equipped with a specimen holder and a device for inserting the specimen holder into the furnace tube. Mineral insulated stainless-steel sheathed thermocouples were used to measure the specimen temperatures at the following locations:

- at the specimen centre
- on the specimen surface
- furnace (mid-depth and 10 mm away from wall)

The average furnace temperature was stabilised for at least 10 minutes at 750 °C (± 5 °C) with a maximum drift of ± 2 °C before testing. The mass of each specimen was determined to an accuracy of 0.1 g before testing.

Table 4 details the test procedure for this reaction-to-fire test.

Table 4 Test procedure

Item	Detail
Statement of compliance	The test was performed in accordance with the requirements of AS 1530.1:1994(R2016).
Variations	A suitable alternative insulating material was used to fill the annular space between the furnace tubes, as specified in clause 4.2 of ISO 1182:2010. During the tests, the thermocouples did not reach equilibrium. The tests were ended after 3600 seconds as described in section 7.4.7 of ISO 1182:2010.
Pre-test conditioning	The specimens were conditioned inside a ventilated oven maintained at a temperature of 60 ± 5 °C for 24 hours. The samples were then cooled to room temperature in a desiccator until immediately prior to testing.
Specimen preparation and mounting	Prior to testing, the discs were stacked and tied together using two fine nickel-chromium wires.
Number of replicate tests	Five
End of test	3600 seconds – as described in section 7.4.7 of ISO 1182:2010.
Test operator	Muntaqim Pereira

3.2 Combustibility criteria

According to clause 3.4 of AS 1530.1:1994 (R2016), a material is considered to be combustible under any of the following circumstances:

- The duration of sustained flaming is greater than zero – as determined by summing the individual durations of flaming of 5 seconds or longer for all the samples and dividing by five.
- The arithmetic mean of the temperature rise of the furnace thermocouple exceeds 50 °C.
- The arithmetic mean of the specimen surface thermocouple temperature rise exceeds 50 °C.

4. Test results

Table 5 shows the summary of observations and calculations of the material samples.

Table 5 Test calculations

Parameter	Symbol or expression	Unit	Results					Arithmetic mean = ∑results/5
			1	2	3	4	5	
Total duration of sustained flaming	Cumulative total of duration of flaming (> 5 s)	s	0	0	0	0	0	0
Test duration		s	3600	3600	3600	3600	3600	3600
Specimen mass								
Initial specimen mass	m_{si}	g	178.1	175.7	174.3	174.6	175.6	
Final specimen mass	m_{sf}	g	178.1	175.5	174.1	174.5	175.5	
Mass loss	$\Delta m = (m_{si} - m_{sf})/m_{si}$	%	0.0	0.1	0.1	0.1	0.1	0.1
Furnace thermocouple temperatures								
Initial	T_{fi}	°C	753.9	746.6	748.6	747.9	746.0	
Maximum	T_{fm}	°C	790.6	775.0	779.4	788.6	781.1	
Final	T_{ff}	°C	787.5	773.8	777.5	788.1	780.5	
Temperature rise	$\Delta T_f = T_{fm} - T_{ff}$	°C	3.1	1.2	1.9	0.5	0.6	1.5
Specimen centre thermocouple temperatures								
Maximum	T_{cm}	°C	767.4	751.7	759.4	752.3	752.9	
Final	T_{cf}	°C	767.3	751.5	759.2	752.2	752.6	
Temperature rise	$\Delta T_c = T_{cm} - T_{cf}$	°C	0.1	0.2	0.2	0.1	0.3	0.2
Specimen surface thermocouple temperatures								
Maximum	T_{sm}	°C	796.9	789.9	798.3	780.7	791.5	
Final	T_{sf}	°C	796.2	789.7	798.2	780.3	791.2	
Temperature rise	$\Delta T_s = T_{sm} - T_{sf}$	°C	0.7	0.2	0.1	0.4	0.3	0.4

4.1 Observations

- No significant events were observed for the duration of the tests.

4.2 Combustibility

The material is not deemed combustible according to the test criteria for combustibility specified in clause 3.4 of AS 1530.1:1994 (R2016).

5. Application of test results

5.1 Test limitations

These test results relate only to the behaviour of the test specimens of the material under the particular conditions of the test and they are not intended to be the sole criterion for assessing the potential fire hazard of the material in use.

Any significant variation with respect to size, construction details, loads, stresses, edge or end conditions is not addressed by this report. Any differences in composition or thickness of the product may significantly affect the performance and will therefore invalidate the test results. It is recommended that any proposed variation to the tested configuration should be referred to the test sponsor. The test sponsor should then obtain appropriate documentary evidence of compliance from Warringtonfire Australia Pty Ltd or another registered testing authority.

It is the responsibility of the supplier of the product to ensure that the product which is supplied for use is identical to the specimens which were tested specimens.

This report details methods of construction, the test conditions and the results obtained when the specific element of construction described here was tested following the procedure outlined in AS 1530.1:1994 (R2016). Any significant variation with respect to size, colour or composition is not addressed by this report.

It is recommended that any proposed variation to the tested configuration should be referred to the test sponsor who should then obtain appropriate documentary evidence of compliance from Warringtonfire Australia Pty Ltd or another registered testing authority.

5.2 Uncertainty of measurements

This report has been prepared based on information provided by the test sponsor. Warringtonfire has not verified the accuracy and/or completeness of that information and will not be responsible for any errors or omissions that may be incorporated into this report as a result.

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