



FH 3841

Cone Calorimeter Test on Putz Technik System 300 EIFS

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All tests reported herein have been undertaken at the BRANZ Ltd laboratories located in Judgeford, Porirua, New Zealand, unless stated otherwise.


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 - iii. any defects in the Products the subject of the Services; or
 - iv. any changes, modifications or alterations to the Products the subject of the Services.

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Cone Calorimeter Test on Putz Technik System 300 EIFS

1. CLIENT

Putz-Technik Products Ltd
27A Neil Park Drive
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New Zealand

2. GENERAL

The product submitted by the client for testing was identified by the client as Putz Technik System 300, an external insulation and finishing system. The test sample preparation was described by the client to consist of a 40 mm EPS substrate to which a 2-3 mm thick reinforced adhesive render base coat plaster was applied, followed by a 1-3 mm thick cement based levelling coat. A 2-5 mm thick cement based texture coat was then applied and finished with two coats of Silco mineral paint. The cream coloured top face was exposed to the radiant heat during the test.

1.1 Sample Measurements

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

Specimen	Specimen ID	Initial properties		Overall apparent density (kg/m ³)
		Mass (g)	Mean thickness (mm)	
Putz Technik System 300	FH3841-50-1	223.5	45.1	496
	FH3841-50-2	204.8	45.2	453
	FH3841-50-3	225.8	45.1	501


2. EXPERIMENTAL PROCEDURE

2.1 Test Standard

The tests were carried out according to the test procedure described in 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 3.4 and 3.5, except that the test duration was 15 minutes in accordance with the New Zealand Building Code Acceptable Solution C/AS1 C 9.1.2.

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2.2 Test Date

The tests were conducted on the 27 June 2007 by Mr Paul Wong.

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 $50 \pm 5\%$ immediately prior to testing.

2.4 Specimen Wrapping and Preparation


All tests were conducted and the samples 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 Program

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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3. RESULTS

3.1 Test Results and Reduced Data

Material	Putz Technik System 300			Mean Value	
	FH3841-50-1	FH3841-50-2	FH3841-50-3		
Specimen test number	1	2	3		
Time to sustained flaming	s	89	85	89	87.7
Observations	i	i	i		
Test duration ^a	s	900	900	900	900
Mass remaining, m_f	g	214.6	196.8	213.0	208.1
Mass pyrolyzed	%	4.0%	3.9%	5.7%	4.5%
Specimen mass loss ^b	kg/m ²	0.90	0.85	0.88	0.88
Specimen mass loss rate ^b	g/m ² .s	14.8	13.9	14.4	14.4
Heat release rate					
peak, \dot{q}''_{max}	kW/m ²	39.9	39.6	31.4	37.0
average, \dot{q}''_{avg}					
Over 60 s from ignition	kW/m ²	16.7	17.3	13.6	15.9
Over 180 s from ignition	kW/m ²	11.1	13.5	10.1	11.6
Over 300 s from ignition	kW/m ²	8.8	11.2	8.3	9.4
Total heat release ^c	MJ/m ²	5.2	6.6	5.1	5.6
Average Specific Extinction Area ^c	m ² /kg	74.2	58.6	33.3	55.3
Effective heat of combustion ^c , $\Delta h_{c,eff}$	MJ/kg	5.1	7.3	3.5	5.3

Notes :

^a 15 minutes according to NZBC C/AS1. Criteria in test standard not used.


^b from ignition to end of test

^c from the start of the test

i no significant observations were recorded

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4. SUMMARY

AS/NZS 3837 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.

Specimen ID	Average HRR over 180s from ignition	Arithmetic mean	% difference from the arithmetic mean
FH3841-50-1	11.1	11.6	-3.9
FH3841-50-2	13.5		16.8
FH3841-50-3	10.1		-12.9

The above table identifies two of the specimens exposed to 50 kW/m² irradiance exceeded the acceptance criteria by up to 6.8%. A further three specimens were not tested as required by the standard. (see conclusion)

The report summary for Putz Technik System 300 as described in Section 2, exposed to an irradiance of 50 kW/m² is:

Mean Specimen thickness (mm)	Irradiance (kW/m ²)	Mean Time to Ignition (s)	Mean Peak Heat Release Rate (kW/m ²)	Mean Total Heat Released (MJ/m ²)
45.1	50	88	37.0	5.6

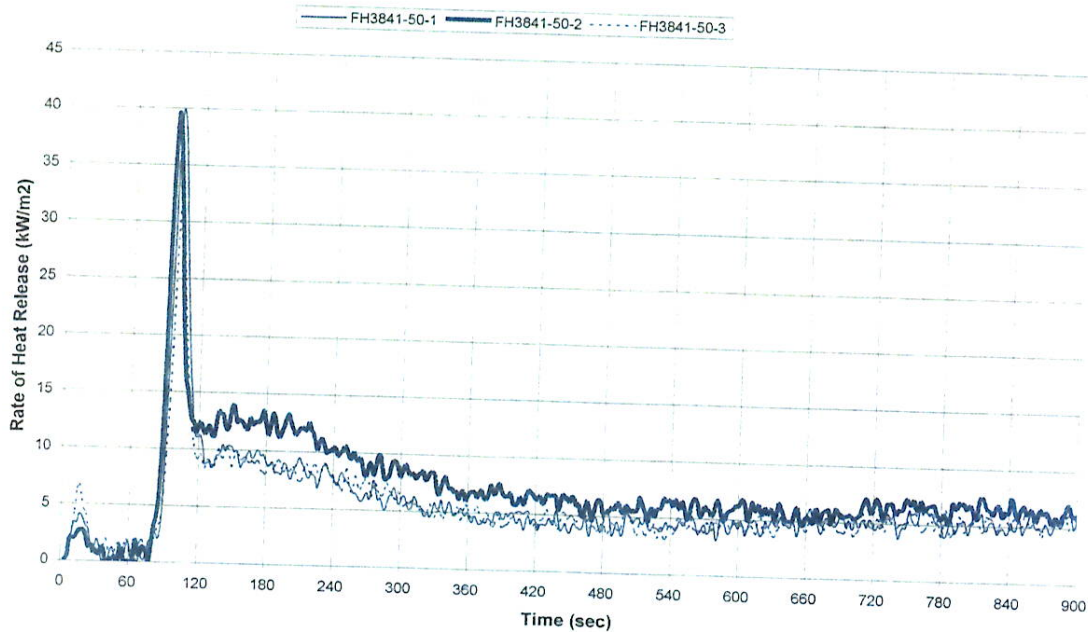



Figure 1. Rate of heat release versus time

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5. CONCLUSION IN ACCORDANCE WITH NZBC ACCEPTABLE SOLUTIONS C/AS1

Although two of the specimens were outside of the variability criteria of the test standard, the peak heat release rates and total heat released values for all three Putz Technik System 300 specimens are sufficiently within the "A" classification bounds (peak heat release < 100 kW/m², and total heat released < 25 MJ/m²) for test results to be considered valid. A further set of three tests as required by the test standard was not deemed to be necessary and would not lead to an alteration of the classification.


For the purposes of New Zealand Building Code Acceptable Solution C/AS1 Part 7.11 and Appendix C9.1 dated 1 June 2001, with respect to the fire properties of external wall cladding systems, Putz Technik System 300 achieved:

Peak rate of heat release	=	37.0	kW/m ²
Total heat release	=	5.6	MJ/m ²

Therefore, it is concluded that Putz Technik System 300 achieves a performance level A classification in accordance with the New Zealand Building Code Acceptable Solutions C/AS1 Table 7.5.

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