SYSTEM BRIEF DETAIL

Report detailing the testing of an HPL rainscreen cladding system tested in accordance with the requirement as described in British Standard 8414-1

Ministry of Housing, Communities & Local Government

CUSTOMER CLASSIFICATION REPORT

BR 135 (Third Edition) Classification Report

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Prepared for:
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Review

Approval	Name	Date
Author	[REDACTED]	16/07/19
Reviewed by	[REDACTED]	16/07/19
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Distribution

Name	Company
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Document version history

Version	Date	Superseded documents/description/details
1.0	16/07/19	First issue
2.0	17/07/2019	Alteration to product description – Section 4.1

Contents

1 Introduction

This report provides a classification of the system detailed below.

Classification is carried out in accordance with the procedures given in BR 135 – 'Fire performance of external thermal insulation for walls of multi-storey buildings', Third edition, 2013[a].

This report should be read in conjunction with BR135 and the associated test evidence recorded in Customer Test Report Number 101856.002.

[a] Annex A for BS8414-1 test or Annex B for BS 8414-2 test

2 Details of the test carried out

Name of Laboratory:	Fire Protection Association Ltd
Laboratory Address:	London Road Moreton-in-Marsh Gloucestershire GL56 0RH
Test reference:	101856.002
Date of Test:	11/07/2019
Sponsor:	Ministry of Housing Communities and Local Government
Sponsor address:	2 Marsham Street London SW1P 4DF United Kingdom
Method:	Tested in accordance with BS 8414-1-2015+A1-2017
Deviations:	None

3 Analysis of fire performance and classification

3.1 Test procedure

The performance criteria and classification method are based on the recommendations of BR135 [2], which states that the primary concerns for performance criteria of these systems are the fire spread away from the initial fire source, and the rate of fire spread. The classification only applies to the system as tested.

For classification to be undertaken the system must be tested to the full test-duration requirements of BS 8414-2 [1] without any early termination of the full fire-load exposure period. Early termination shall be conducted if:

a) Flame spread extends above the test apparatus at any time during the test duration (60 minutes after ignition of the fuel source); or

b) There is a risk to the safety of personnel or impending damage to equipment.

If fire spreads away from the initial fire source, the rate of fire spread or tendency to collapse should not unduly hinder intervention by the emergency services.

3.2 Thermocouple locations

Figure 1 shows the location of thermocouples used in the test.

Fire spread is measured by type K thermocouples set at levels 1 and 2 (Figure 1). The start time for fire spread is initiated when the temperature first recorded by any external thermocouple at level 1 equals or exceeds a 200 °C temperature rise above the start temperature and remains above this value for at least 30 seconds.

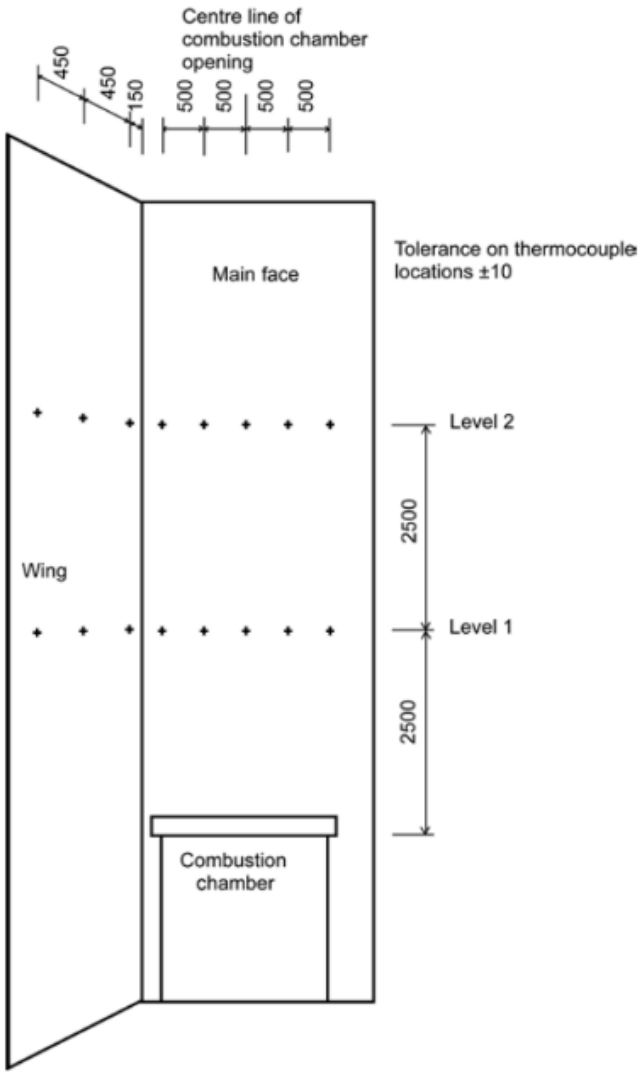

Figure 1 - Location of thermocouples – dimensions in mm

3.3 System performance

System performance is evaluated against the following criteria:

1. External fire spread: The temperature recorded at any external thermocouple at level 2 should not exceed T_s by more than 600˚C for a period of at least 30 seconds, within 15 minutes of start time t_s.

2. Internal fire spread: The temperature recorded at any internal thermocouple at level 2 should not exceed T_s by more than 600˚C for a period of at least 30 seconds, within 15 minutes of start time t_s.

3. Mechanical performance: No failure criteria are set for mechanical performance. However, ongoing system combustion following extinguishing of the ignition source shall be included in the test classification reports, together with details of any system collapse, spalling, delamination, flaming debris or pool fires. The nature of the mechanical performance should be considered as part of the overall risk assessment when specifying the system.

4 Test system

4.1 Description of test specimen

Rainscreen:

10mm High Pressure Laminate [REDACTED] Anthracite

- Manufacturer's stated reaction to fire classification in accordance with BS EN 13501: Euroclass B-s1, d0
- Large flange stainless steel rivets 5x16mm
- 10mm gap between horizontal and vertical joints

Insulation:

180mm [REDACTED] Insulation Board

- Manufacturer's stated reaction to fire classification in accordance with BS EN 13501: Euroclass A1
- 70mm stainless steel pressure plates and 230mm SDKBV10x Fasteners, no washer. (6no Fixings to every board)
- Vertical & Horizontal Joints sealed with UL723 FR Grade Aluminium 50mm wide foil tape

'Helping Hand' Brackets & Rainscreen Fixing Metalwork:

[REDACTED] 200mm Brackets

- Single Brackets – 2no SDF-KB-10Vx60E Fixings 32mm Long
- Double Brackets – 2no SDF-KB-10Vx60E Fixings 32mm Long

[REDACTED] T & L Bars

- Single brackets to bars -2no self-drilling stainless steel 4.2mm x 16mm, no washer
- Double brackets to bars – 4no self-drilling stainless steel 4.2mm x 16mm, no washer
- 10mm gap between T & L Bars

Cavity Barriers:

[REDACTED] E90 I30 Open State Cavity Barrier

- 2no galv brackets per 1200mm Barrier (300mm from ends and C/L) on verticals
- 3no galv brackets per 1200mm Barrier (200mm from ends and one in the centre) on horizontals
- 2no SDFKB10Vx60E, no washer per galv bracket
- [REDACTED] E90 I30 Solid/Fully Filled Cavity Barrier – 245mm Overall (10mm compression)
- [REDACTED] E90 I30 Open State Horizontal Cavity Barrier - 210mm overall to allow a 25mm air gap (expands an additional 44mm)

4.2 Installation of specimen

The specification of the materials of the cladding system were undertaken by the test sponsor. The system design, procurement and installation were undertaken on behalf of the FPA under the guidance of the test sponsor.

Figure 2 – Finished installation on the test wall

5 Test results

Table 1 – System performance

Test criteria	Requirement met/not met
System tested to full duration	Requirement met
External fire spread	Requirement met
Internal fire spread	Requirement met
Mechanical performance	See section 6

6 Mechanical performance

6.1 Post-test damage report

Post-test, the system was inspected to determine the amount of damage to system components. The result are as follows.

Rainscreen

- All panels were damaged or partially damaged. See Figure 3, Figure 4 and Figure 5.
- On the main wall the worst damaged area was directly above the combustion chamber. Approximately 50% (by area) of the panels had been consumed or become detached from the system.
- On the return wall the worst damaged areas were adjacent to and directly above the combustion chamber. Approximately 15% by area of the panels had been consumed or become detached from the system.
- On the return wall near the base, the panels had warped, resulting in the outside edge curling in towards the combustion chamber.

Insulation

- The insulation had smoke deposits on the front surface, but otherwise it was generally in good condition. See Figure 6.

Rainscreen Fixing Metalwork:

- Where the rainscreen had been consumed/fallen away from the system, the majority of exposed aluminium rails were missing. See Figure 3.
- In areas where the rainscreen was still present, the rails remained intact although slightly warped in places.

Helping had brackets

- Where the rainscreen had been consumed/fallen away from the wall, the section of the helping hand brackets that extended out past the front of the insulation were melted or partially melted. Within the insulation the brackets were in generally good condition.
- In areas where the rainscreen were still present, the helping hand brackets were generally in good condition.

Horizontal intumescent cavity barriers

- 1st cavity barrier (directly above combustion chamber). See Figure 7 and Figure 8.
    - Above the combustion chamber, the barrier was partially detached from the wall and the intumescent strip was not present.
    - On the return wall the intumescent strip had fully activated.
- 2nd cavity barrier. See Figure 9 and Figure 10.
    - The barrier was intact.
    - On the section between the vertical cavity barriers, directly above the combustion chamber, the intumescent strip was not present.
    - Outside this area on the main wall and on the return wall the intumescent strips had fully activated.
- 3rd cavity barrier. See Figure 11 and Figure 12.
    - The barrier was intact.
    - On the section between the vertical cavity barriers, directly above the combustion chamber, the intumescent strip had fully activated.

  - Outside this area on the main wall and on the return wall the intumescent strips had partially activated.
- 4th barrier (near top of wall). See Figure 13 and Figure 14.
  - The barrier was intact.
  - On the section between the vertical cavity barriers, directly above the combustion chamber, the intumescent strip had partially activated.
  - Outside this area on the main wall and on the return wall the intumescent strips had partially activated.

Vertical compression cavity barriers

- The 3 vertical barriers appeared to be in good condition. See Figure 6.

6.2 Post-test photographs

Figure 3 – Front face of system post test

Figure 4 – Area directly above combustion chamber post test

Figure 5 – Return wall above combustion chamber post test

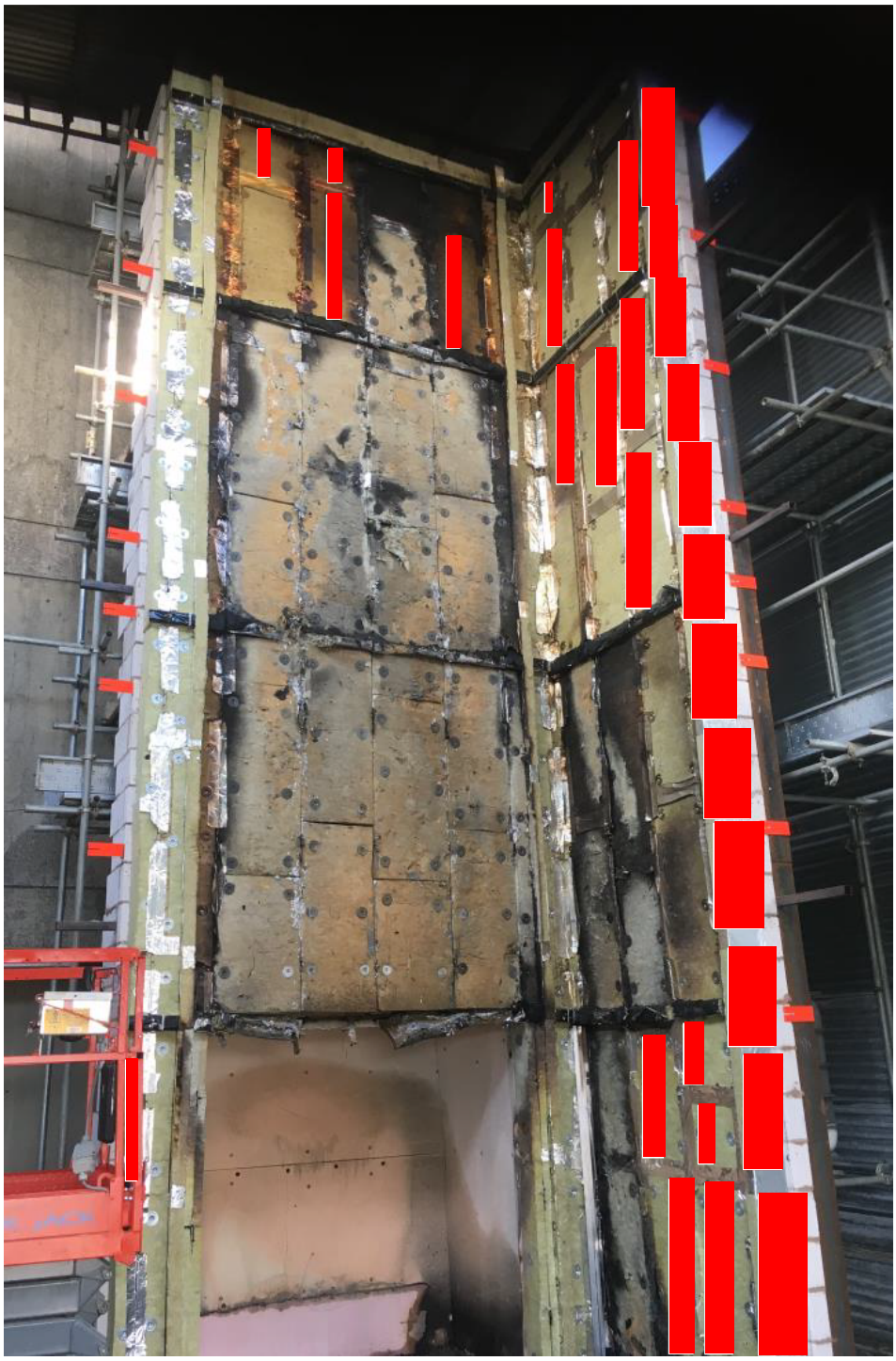

Figure 6 – Insulation board and cavity barriers following removal of the rainscreen and support rails

Figure 7 – 1st cavity barrier (directly above burn chamber) from main wall following removal of the rainscreen

Figure 8 – 1st cavity barrier (directly above burn chamber) from return wall following removal of the rainscreen

Figure 9 – 2nd cavity barrier from main wall following removal of the rainscreen

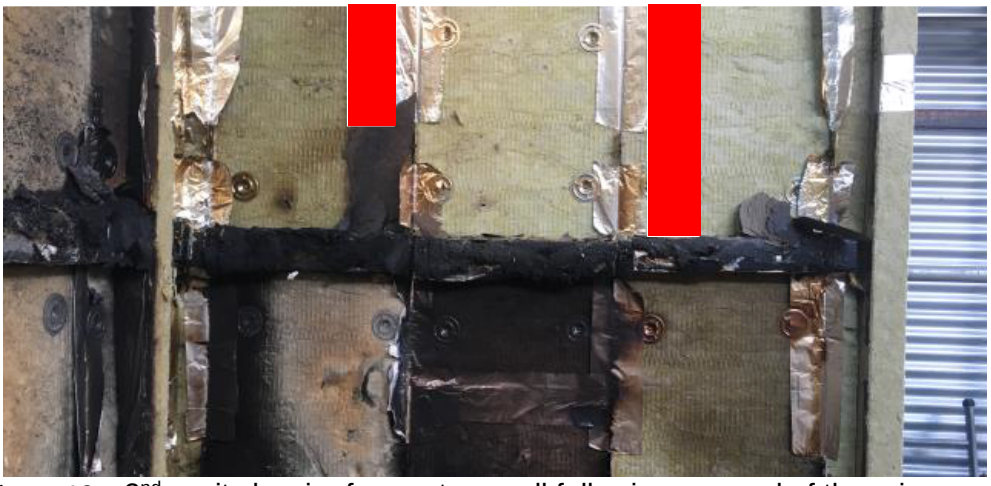

Figure 10 – 2nd cavity barrier from return wall following removal of the rainscreen

Figure 11 – 3rd cavity barrier from main wall following removal of the rainscreen

Figure 12 – 3rd cavity barrier from return wall following removal of the rainscreen

Figure 13 – 4th cavity barrier (top) from main wall following removal of the rainscreen

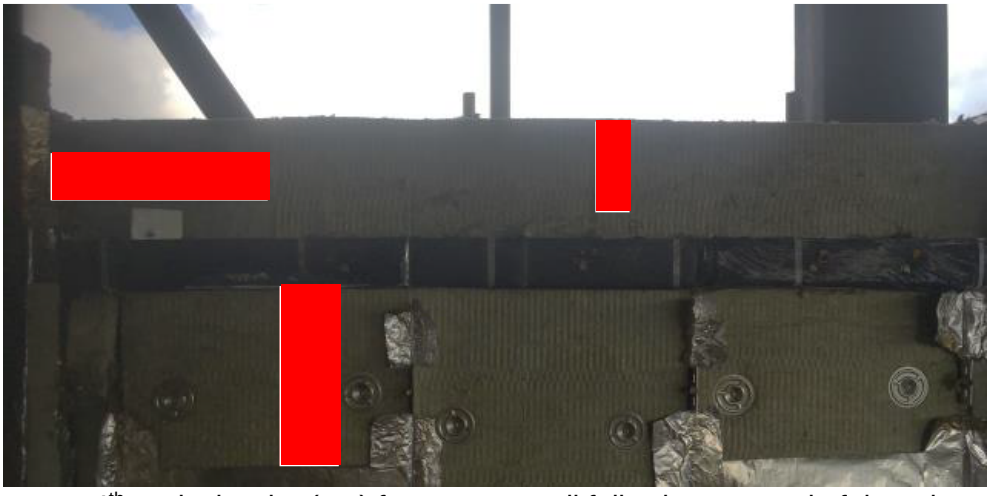

Figure 14 – 4th cavity barrier (top) from return wall following removal of the rainscreen

7 Classification and restrictions

7.1 Classification

The system described in this report has been tested and met the performance criteria set in BR 135:2013[b].

7.2 Restrictions

Following the at Grenfell Tower in 2017, testing, classification, regulation and recommendations surrounding the testing and use of cladding materials on high rise buildings are all being examined in the UK. As a result, the relevance of a successful BR135 classification report may expire.

It is therefore recommended that the current regulatory climate should be assessed before a successful BR135 classification report is relied upon as evidence of suitability.

The FPA test laboratory that issued the report will be able to offer assistance in this regard.

This classification is valid only for the system described herein, installed and detailed.

This classification report does not provide type approval for similar systems or for any individual component parts that were used within the system tested.

[b] Annex A for BS8414-1 test or Annex B for BS 8414-2 test

8 References

[1] British Standards Institute, “BS 8414-2:2015+A1:2017, Fire performance or external cladding systems - Part 2: Test method for non-loadbearing external cladding systems fixed to supported by a structural steel frame,” British Standards Institute, London, 2017.

[2] S. Colewell and T. Baker, “BR135 Fire performance of external thermal insulation for walls of multistorey buildings, Third Edition,” IHS BRE Press, Watford, 2013.