SYSTEM BRIEF DETAIL

Report detailing the classification of a Hilti ventilated façade with thermal bridge reducing bracket and mineral wool insulation tested in accordance with the requirement as described in British Standard 8414

CUSTOMER CLASSIFICATION REPORT

BR 135 (Third Edition) Classification Report

Report by

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Report Prepared for

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Review

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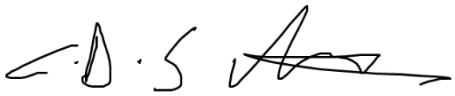
Reviewers signature		

Distribution

Name	Company

Document version history

Version	Date	Superseded documents/description/details
1.0	25th Feb 2019	Initial issue
2.0	27th Feb 2019	Alterations to component descriptions supplied by client in Section 4
3.0	6th March 2019	Cover photograph changed at request of client

Disclaimer

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- This report may only be distributed in its entirety, without amendment.
- Results presented relate only to the specimens tested.
- FPA takes no responsibility for the design, materials, workmanship or performance of the product tested.
- The report does not constitute an approval, certification or endorsement of the products tested.
- Any references made to this work must be accompanied by provision of the full, unabridged, report.
- The report does not imply that FPA believe the BS8414 test regime alone is appropriate for the guarantee of end-use system performance.

THE FIRE PROTECTION ASSOCIATION IS ACCREDITED BY UKAS TO CARRY OUT BS 8414 TESTS AND TO PRODUCE BR 135 CLASSIFICATION REPORTS

14TH February 2019

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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 101512.001 Issue 01.

[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:	101512
Date of Test:	28/11/2018
Sponsor:	Hilti (Gt. Britain) Ltd
Sponsor address:	1 Trafford Wharf Road, Trafford Park, Manchester, M17 1BY
Method:	Tested in accordance with BS 8414-2-2015+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 s.

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.

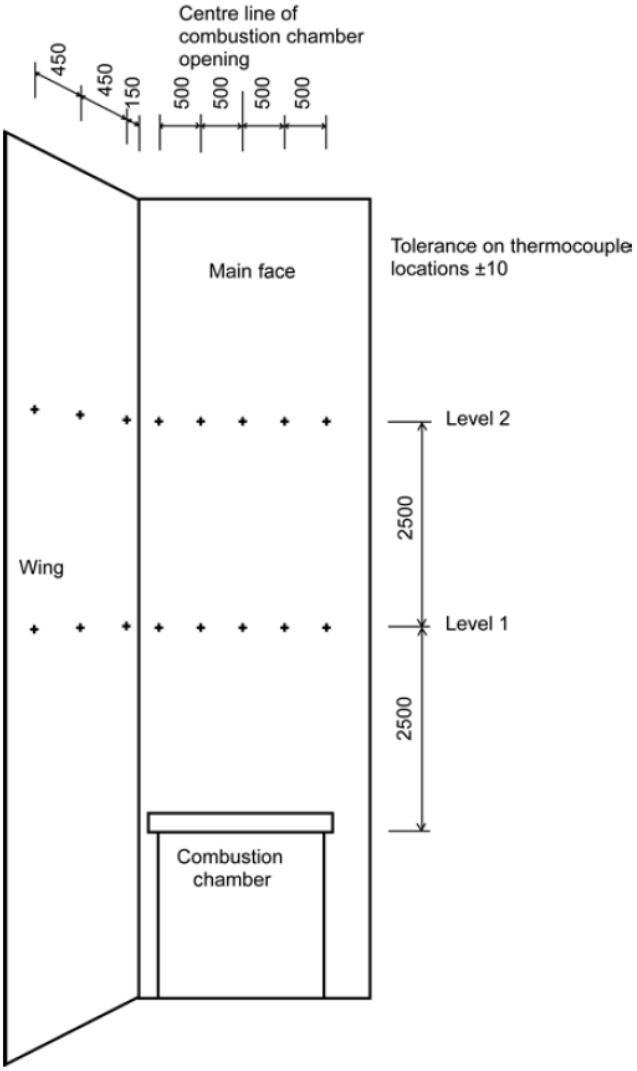

Figure 1. Location of thermocouples – dimensions in mm

4 Test system

4.1 Description of test specimen

Full details of the system specification and installation details have been provided by the test sponsor and are summarised in this section. The system, as built comprised of:

- MFT-FOX VT 240 L6,5 brackets - fixed vertically at nominal 600mm centres.
- Hilti Self-drill screw S-MD 53S - used to fix brackets on SFS (2 per bracket)
- MFT-L 60x40 1,8 - fixed to the brackets.
- Hilti S-AD 01S 5,5x19 screws – used to fix L- and T- profile.
- MFT-T profile – used to support in panel joints
- Insulation (Melting point >1000°C) 600mm x 1000mm x 100mm– installed as single or double layer. with long-edges horizontal.
- Insulation fastener S-IP+S-ID and S-IW+S-ID – used to fix insulation on SFS-Wall
- Fire break – Hilti FS cavity closure CP 674 – installed horizontally at 3m above hearth.
- ‘Cembrit 8mm’ fibre cement board (1400mm x 990mm x 8mm) – fixed horizontally to ‘L’ and ‘T’ profiles.
- ‘6474357’ – Rivets 4.8 x 16.7mm – 12 fixings (in 3 columns) per ‘Cembrit 8mm’ panel

4.2 Installation of specimen

The design, installation, procurement and specification of the materials of the cladding system were undertaken by the test sponsor. It was the responsibility of the test sponsor to ensure that all components were install as per the manufacturer's guidelines.

Figure 1 – Cladding system installation, pre-test.

For identification purposes during the test, the rain screen panels on the front face around the burn box were numbered 1a-d, above the burn box on the front face numbered 2-13 and, on the wing, numbered 14-21.

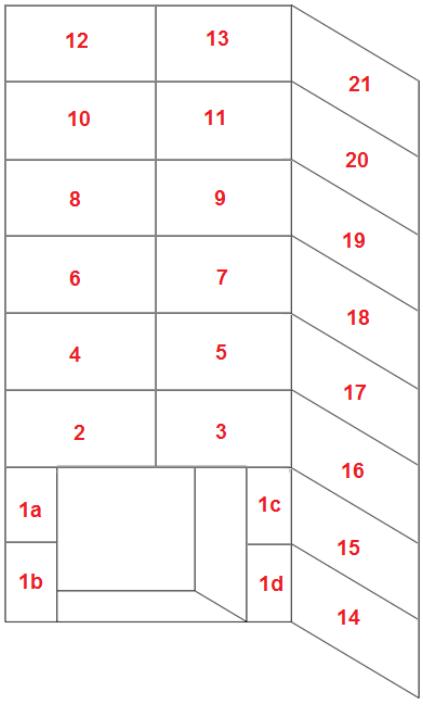

Figure 2 – Numbering system for rain screen panels

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 5.1) Significant energetic spalling of façade panels

5.1 Mechanical performance

The cladding system was tested for the full 60-minute duration of the test. Significant amounts of spalling from the cladding panels was observed. Pictures of the damage caused during the test can be found the accompanying BS 8414 test report 'FPA-101512.001'.

Façade Panel

- 19 of the 22 façade panels suffered damage during the test, with the damage extending to the top of the main wall, above the cavity barrier.
- Large areas of the façade had detached from the cladding structure with significant velocity during the test
- Soot deposits and charred marks were observed on most of the remaining façade panels when inspected post-test.

Mineral Wool Insulation

- The mineral wool on the main wall suffered a large area of charring, however apart from the aesthetic damage seemed in relatively good condition.

Aluminium Structure

- Large sections of the vertical aluminium 'T' brackets had melted away after the façade panels had become detached.
- Beneath the remaining façade panels, the aluminium structure remained intact.

Helping Hand Brackets

- The composite helping hand brackets suffered melting of the aluminium outer bracket.
- The plastic parts of the brackets were largely protected within the mineral wool insulation layer.

Horizontal cavity barriers

- There was a noticeable difference in the charring to the mineral wool insulation layer either side of the intumescent cavity barrier.
- The intumescent strip had clearly activated and expanded to fill the air gap.

Backing Board

- The backing board had been burned away at the bottom of the cladding structure, above the top face of the lintel. Other than this, the backing board remained undamaged.

6 Classification and restrictions

6.1 Classification

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

6.2 Restrictions

- Following the fire 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

7 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.