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BRE Global Classification Report

Kingspan Ltd. Classification of fire performance in accordance with BR 135: 2013 Annex B on a BENCHMARK 220mm QuadCore™ Wall liner panel with a Corium brick system.

Prepared for:	**Kingspan Limited**
Date:	**28th November 2016**
Report Number:	**Supplementary classification report P102340-1002 issue 1**

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CLASSIFICATION OF FIRE PERFORMANCE IN ACCORDANCE WITH BR 135:2013 Annex B

Sponsor: Kingspan Ltd, Greenfield Business Park No.2, Holywell, Flintshire,CH8 7GJ, UK

Prepared by: BRE Global Ltd, BRE, Bucknalls Lane, Garston, Watford, WD25 9XX, England

Product name: BENCHMARK 220mm QuadCore™ Wall liner panel with a Corium brick system.

Classification report No.: Supplementary classification report P102340-1002

Issue number: 1

Date of issue: 28 November 2016

This classification report consists of 20 pages and may only be used or reproduced in its entirety.

1 Introduction

This report presents the classification of the system detailed in section 2. The 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, Annex B 2013. This classification should be read in conjunction with this document and the associated test reports referenced in section 4.

This is a supplemental classification report and as such the product has not been re-evaluated, re-tested or re-classified. At the request of the test sponsor, detailed drawings of the system have been removed and replaced with drawing references. The original test and classification reports were issued with the drawings and have not been superseded by this supplemental classification report.

2 Details of the Classified Product

2.1 Description of substrate

The test specimen was installed onto face 4 of the BRE Global External Cladding Test Facility. This is a multi-faced test facility constructed from steel, the cladding system was affixed to the steel substructure.

2.2 Description of product

The system prior to test is shown in Figure 1. Full details of the system specification and installation details have been provided by the client and are summarised in the following section. The system, as built comprised of:

- Galvanised mild steel support brackets
- 220mm QuadCore™ wall liner panel.
- Powder coated top hat sections
- Support rails
- Intumescent fire barrier
- Corium brick system façade
- Parex Ltd Historic Pointing mortar KL

2.3 Installation of cladding System.

2.3.1 Steel substructure and fixings

A sectional steel sub frame was installed using 125mm x 50mm galvanised steel L angles which were fixed on the top and bottom of the floor slab hangers on the main cladding wall. The angles were fixed back the concrete using SFS Intec ISOFAST T1- 6.3 x 55 mm self-tapping concrete screws at 300mm centres. The L brackets were fixed to the steel brackets with Saphir HS 5.5 x 55mm hex head screws fixed at 300mm centres.

2.3.2 Insulated Panel

A single layer of Kingspan 220mm QuadCore™ wall liner panel was attached to the metal sub frame using SFS Intec SXC 14-5.5 x 275mm self-drilling and self-tapping screws. All panels were installed in a vertical orientation. Each panel had 5 fixings, with a sealing washer WM-40 EP/ 6.1 on each fixing. The exposed edges of each panel was covered using 75mm x 320mm x 0.7mm flashings, with each flashing fixed in place with SX3/9-S16-6 x 29mm fixing fixed at 300mm centres. Each joint on the panel was fixed using SXW- L12-5.5 x 42mm screws, fixed at 600mm centres. Standard 1100mm wide panels were installed and cut to width were required.

2.3.3 Cladding system

An array of powder coated top hat sections were fixed to the panel system at 275mm were fixed to the insulated panel using FL6 –S-8 x 34 expanding panel fixings. Each rail had two strips of PVC Isolation tape (KSSVG25) fixed to the flanges to isolate the rail from the insulated panel.

2.3.4 Fire breaks

Three horizontal ventilated fire breaks (Tenmat FF 102 /50. FF102 x 6.0 x 75 x 1000mm) in a continuous strip, were fixed back to the insulated panel with self-tapping counter sunk screws, drilled through the fire break with the fixings at the manufacturer's recommended spacing of 250mm centres.

2.3.5 Rain screen

Once all the rails were attached a layer of Corium support rails (KSBM – CORIUMCHHPS) were attached horizontally to the top rails using SX3/9 –S16-6 x 29 self-drilling fixings which were fixed at nominal 550mm centres. Standard, plain finish 215mm x 65mm, Corium 12000 bricks were clipped into the support rails to form the cladding façade, with the joints staggered between rows. Once complete, the layer of Corium brick were pointed using Historic pointing mortar KL, which was applied with a mortar gun and finished with a jointing tool. When the mortar was partially dried, the excess material was cleaned off and the full system wiped down with a damp cloth.

2.4 Installation of Specimen

All test materials were supplied and installed by the sponsor. BRE were not involved in the sample selection process and therefore cannot comment upon the relationship between samples supplied for test and the product supplied to market.

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3 Product Specification

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Figure 1. System prior to test.

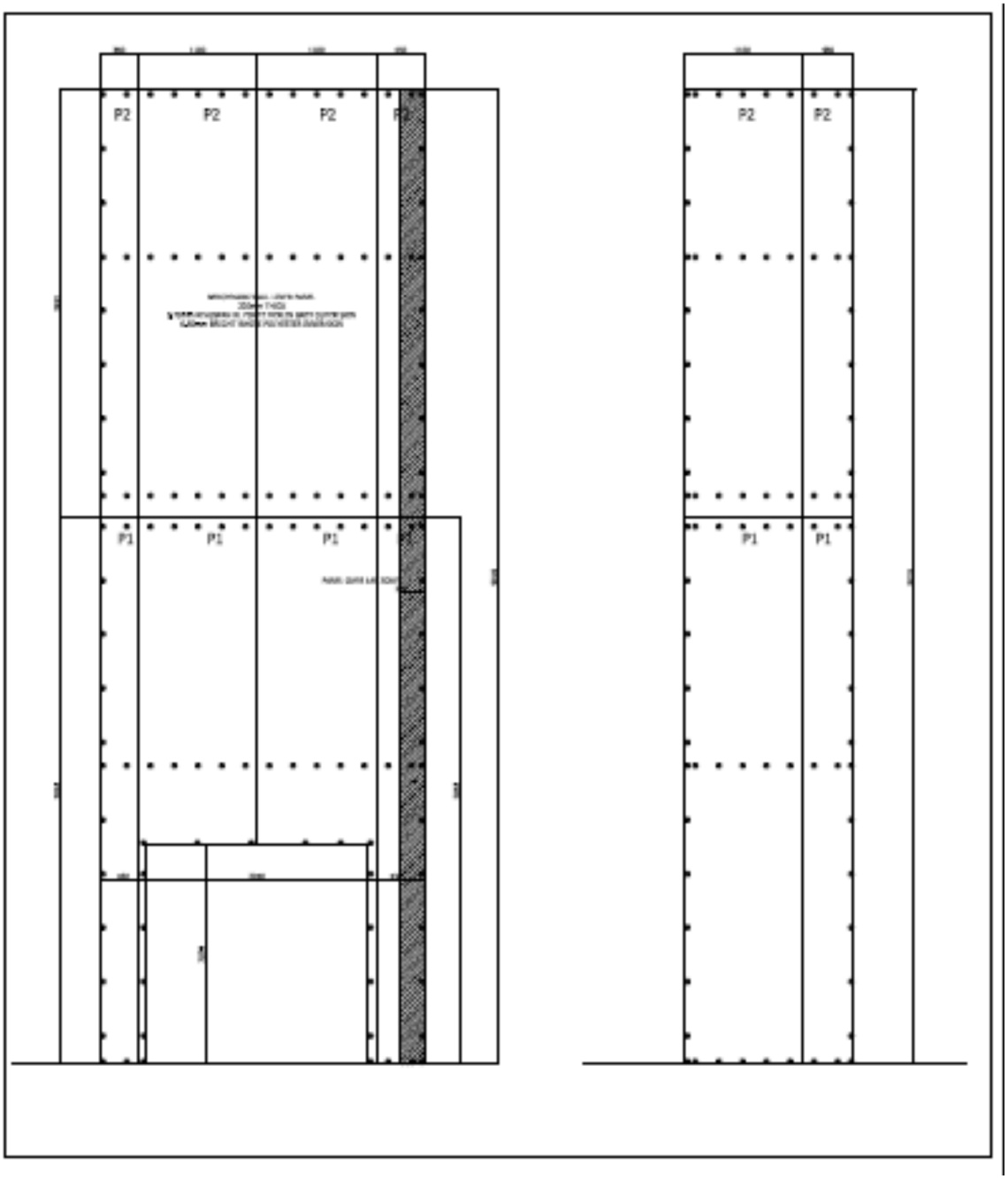

Figure 2. Product details

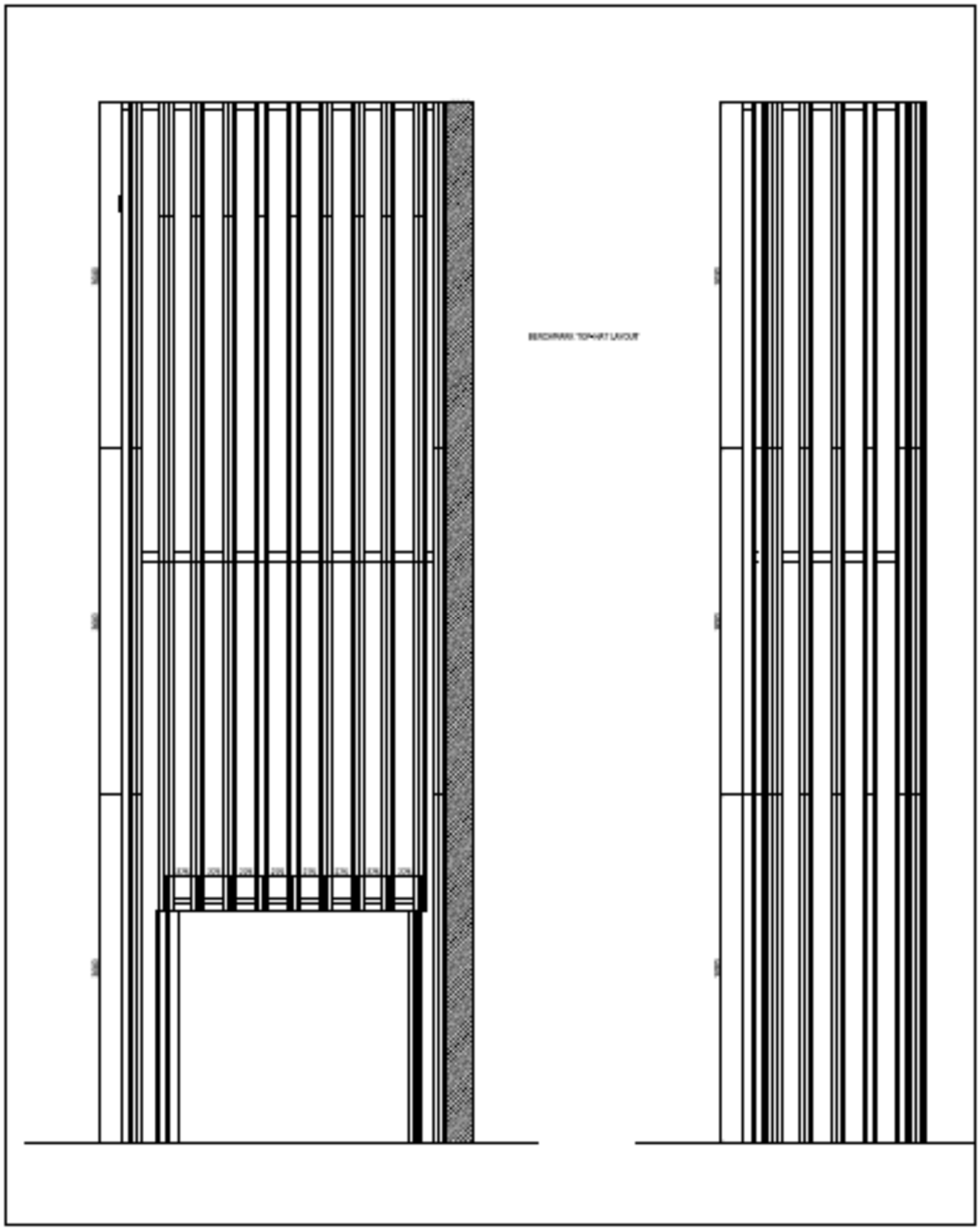

Figure 3. Product details

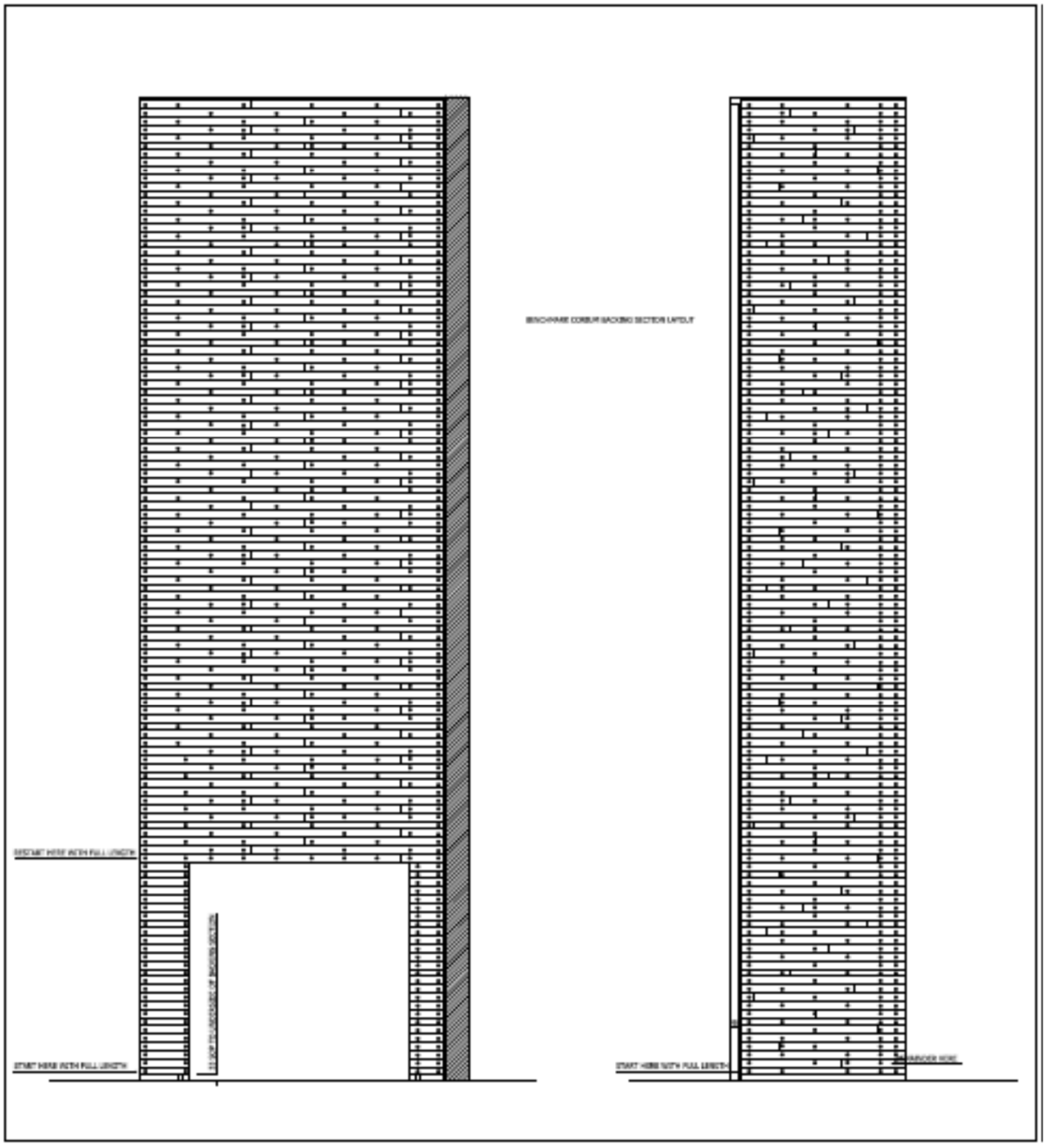

Figure 4. Construction of the System showing the Corium Rails layout.

Document title	Document number	Revision
Panel Dimensions	BWL 054	0
Combustion chamber vertical panel joint	Corium WL Vt	0
Internal corner	Corium WL Vt	0
Floor to floor detail	Corium WL Vt	0
Conbustion (sic) chamber head	Corium WL Vt	0

Figure 5. Other drawings

4 Supporting Evidence

4.1 Test reports

Name of Laboratory	Name of sponsor	Test reports/extended application report Nos.	Test method / extended application rules & date
BRE Global, BRE	Kingspan Ltd	P102340-1000 issue 1	BS 8414-2: 2005

4.2 Test results

Test method & test number	**Parameter**	**No. tests**	**Results**	
			Fire spread test result time, t_s (min)	**Compliance with parameters in Annex B BR135:2013**
BS 8414-2: 2005	External fire spread	1	>15 minutes	Compliant
	Internal fire spread Cavity		>15 minutes	Compliant
	Internal fire spread Insulation layer		>15 minutes	Compliant

4.3 Mechanical Performance

4.3.1 External layer

Damage to the outer layer of Corium brick was within the flame plume and was limited to the loss of three full Corium brick on the main wall and five half bricks. The remaining damage consisted of minor spalling of the surface of seven bricks.

On the wing wall the damage consisted of minor spalling of the surface of fifteen bricks.

4.3.2 Corium support rails

On the main wall there was some minor distortion of the Corium support rails within the flame plume area. The rails were also discoloured by the heat.

On the wing wall the rails were discoloured by the heat and were slightly distorted in an area 0.5 m (wide) by 1.5m (high).

4.3.3 Insulation panel

On the main wall, there was damage to the steel skin of the panels within the flame plume area. This consisted of distortion of the skin and charring of the paint surface.

On the wing wall, there was charring of the paint on the steel skin of the panels 0.5m (wide) by 1.5m (high).

The steel skin of the panels was removed and the insulation was examined.

On the main wall, there was surface discolouration of the insulation material that aligned with the fire plume.

On the wing wall, there was no visible damage to the insulation.

4.3.4 Collapse

There was no collapse of any part of the system throughout the duration of the test.

5 Classification and field of application

5.1 Reference of classification

This classification has been carried out in accordance with Annex B of BR 135 – 'Fire performance of external thermal insulation for walls of multi-storey buildings.' Third Edition 2013.

5.2 Classification

The system described in this classification report has been tested and met the performance criteria set in Annex B of BR 135:2013.

5.3 Field of application

This classification is valid only for the system as installed and detailed in Section 2 of this classification report and the associated details found in the related test reports, referenced in Section 4.

6 Limitations

This classification document does not represent type approval or certification of the product.

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons, it is recommended that the relevance of test and classification reports over five years old should be considered by the user. The laboratory that issued the report will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test or classification to ensure that they are consistent with current practices, and if required may endorse the report.

Report Ends