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Title:

EXTENDED APPLICATION REPORT IN
ACCORDANCE WITH BS EN 15725: 2010
& EN/TS 15117: 2005

Product Names:

"FastClad A2"

Report No:

WF 524131

Issue No:

1

Prepared for:

Advanced Construction Systems
FastClad Building,
Granite Close,
Enderby,
Leicester,
LE19 4AE

Date:

13th December 2022

1. Introduction

This report extends the field of application of test results obtained for “FastClad A2”, a family of brick slip rainscreen cladding products. Extended application enables the prediction of fire performance, on the basis of one or more test results to the same test standards and enables the classification of product ranges and product families.

2. Details of Product Family

A product family is a group of products, which differ only in aspects that do not influence the properties required in the relevant product standard and, if relevant, end-use parameters, for which the reaction to fire performance remains unchanged (i.e. does not get worse).

The product family for which extended application is to be used is “FastClad A2”, a family of brick slip rainscreen cladding products.

There are a number of product properties which vary within this product family, namely:

- Brick colour – any colour
- Brick Compressive Strength – 7N/mm^2 to 125N/mm^2
- Mortar colour – any colour

These properties were assessed to determine their influence on the fire performance of the product when tested in accordance with EN 13823: 2020 and EN ISO 1716: 2018, and classified in accordance with EN 13501-1: 2018.

2.1 Product description

The product family, “FastClad A2”, a family of brick slip rainscreen cladding products, is fully described below and in the test reports provided in support of classification listed in Clause 3.1.

General description		Brick slip rainscreen cladding
Product reference of overall composite		“FastClad A2”
Name of manufacturer of overall composite		Advanced Construction Systems Limited
Thickness of overall composite		32mm
Weight per unit area of overall composite		53kg/m^2
Brick slip (Test face)	Generic type	Clay brick cut to slip
	Name of manufacturer	Wienerberger, The Bespoke Brick Co., Ibstock PLC, Crest Brick Slate and Tile Ltd (as tested)
	Colour reference	Any
	Thickness	15mm
	Weight per unit area	20 - 24kg/m^2
	Flame retardant details	**See Note 1 below**
Adhesive	Generic type	A2 fire rated epoxy adhesive
	Product reference	“S-2865FRE ACS”
	Name of manufacturer	Structural Adhesives Limited
	Application rate	652g/m^2 wet applied (509g/m^2 dry/cured)
	Application method	Steel stencil to limit application
	Flame retardant details	**See Note 1 below**
	Curing process	Two part chemical cure

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Mortar (between brick slips)	Generic type	Lime mortar
	Product reference	"Ultrascape Regency Range", "Historic Mortar EA203"
	Name of manufacturer	Instamac Group PLC, Parex Limited
	Colour	Any
	Application rate	5kg/m^2
	Application thickness	15mm
	Application method	Gun injected into joints
	Flame retardant details	**See Note 1 below**
	Curing process	Hydration
Board	Generic type	A2 cement particle board
	Product reference	"Betopan Plus – FastClad Profile"
	Name of supplier	Tepe Betopan
	Thickness	16mm
	Density	1450kg/m^3
	Weight per unit area	24kg/m^2
	Colour	Natural
	Flame retardant details	**See Note 1 below**
Metal rails	Generic type	Structural grade steel galvanised to 7275g/m^2
	Product reference	"Top Hat Rail"
	Name of manufacturer	Architectural Profiles Limited
	Thickness	2mm
	Weight per unit area	2.92 kg/m^2
	Dimensions	80mm wide, 15mm deep, 1500mm long
	Flame retardant details	This product is inherently flame retardant
Substrate (EN 13238: 2010)	Generic type	Calcium silicate based board
	Product reference	"Promat – Brandschultzbauplatten; Promatect-H"
	Name of supplier	Promat
	Thickness	12mm
	Density	870kg/m^3
	Flame retardant details	This product is inherently flame retardant
Mounting and fixing details		A 40mm ventilated cavity was situated between the reverse face of the specimens and the calcium silicate substrate as defined in EN 13238:2010
Brief description of manufacturing process		The A2 fire rated adhesive is applied to the FastClad profiled A2 cement particle board via stainless steel stencil. Brick slips are manually placed onto the areas where the adhesive has been placed and the boards are left to cure. The boards are screw fixed utilising stainless steel screws to the galvanised steel top hat rails which form the structure and provides a drained and ventilated cavity. The gap between the slips is pointed with a lime mortar via a pointing gun, tooled to a finish and left to cure.

Note 1: The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the component.

3. Test reports / classification reports & test results in support of classification

3.1 Test reports / classification reports

Name of Laboratory	Name of sponsor	Test reports / classification report Nos.	Test method / classification rules & date
Warringtonfire	Advanced Construction Systems	435488, 435487, 435489, 437113, 510383, 510384, 510385, 510387 510680, 510681 (Issue 2), 510682	EN ISO 1716: 2018
Warringtonfire		Formal: 435852 (Issue 4), 521502 (Issue 2) Indicative: 514730 (Issue 2), 514731 (Issue 2), 514732 (Issue 2), 514733 (Issue 2), 517868 (Issue 2), 517869 (Issue 2), 517870 (Issue 2)	EN 13823: 2020
Warringtonfire		WF 524130	EN 13501-1: 2018

3.2 Test results

Test method & test number	Parameter	No. tests	Report	Results	
				Continuous parameter - mean (m)	Compliance parameters
EN 13823	FIGRA $_{0.2MJ}$	3	435852 (I4)	0 W/s	-
		3	521502 (I2)	0 W/s	-
		1	514730 (I2)	0 W/s	-
		1	514731 (I2)	0 W/s	-
		1	514732 (I2)	0 W/s	-
		1	514733 (I2)	9 W/s	-
		1	517868 (I2)	0 W/s	-
		1	517869 (I2)	0 W/s	-
		1	517870 (I2)	0 W/s	-
	FIGRA $_{0.4MJ}$	3	435852 (I4)	0 W/s	-
		3	521502 (I2)	0 W/s	-
		1	514730 (I2)	0 W/s	-
		1	514731 (I2)	0 W/s	-
		1	514732 (I2)	0 W/s	-
		1	514733 (I2)	9 W/s	-
		1	517868 (I2)	0 W/s	-
		1	517869 (I2)	0 W/s	-
		1	517870 (I2)	0 W/s	-
	THR $_{600s}$	3	435852 (I4)	0.4 MJ	-
		3	521502 (I2)	0.3 MJ	-
		1	514730 (I2)	0.6 MJ	-
		1	514731 (I2)	0.0 MJ	-
		1	514732 (I2)	0.1 MJ	-
		1	514733 (I2)	1.2 MJ	-
		1	517868 (I2)	0.1 MJ	-
		1	517869 (I2)	0.0 MJ	-
		1	517870 (I2)	0.1 MJ	-
	LFS	3	435852 (I4)	-	Compliant
		3	521502 (I2)	-	Compliant
		1	514730 (I2)	-	Compliant
		1	514731 (I2)	-	Compliant
		1	514732 (I2)	-	Compliant
		1	514733 (I2)	-	Compliant
		1	517868 (I2)	-	Compliant
		1	517869 (I2)	-	Compliant
		1	517870 (I2)	-	Compliant

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	SMOGRA	3	435852 (I4)	0 m^2/s^2	-
		3	521502 (I2)	0 m^2/s^2	-
		1	514730 (I2)	0 m^2/s^2	-
		1	514731 (I2)	0 m^2/s^2	-
		1	514732 (I2)	0 m^2/s^2	-
		1	514733 (I2)	0 m^2/s^2	-
		1	517868 (I2)	0 m^2/s^2	-
		1	517869 (I2)	0 m^2/s^2	-
		1	517870 (I2)	0 m^2/s^2	-
	TSP_{600s}	3	435852 (I4)	2 m^2	-
		3	521502 (I2)	13 m^2	-
		1	514730 (I2)	0 m^2	-
		1	514731 (I2)	4 m^2	-
		1	514732 (I2)	2 m^2	-
		1	514733 (I2)	5 m^2	-
		1	517868 (I2)	20 m^2	-
		1	517869 (I2)	21 m^2	-
		1	517870 (I2)	19 m^2	-
	Fall of Flaming Droplet/Particle?	3	435852 (I4)	-	Compliant
		3	521502 (I2)	-	Compliant
		1	514730 (I2)	-	Compliant
		1	514731 (I2)	-	Compliant
		1	514732 (I2)	-	Compliant
		1	514733 (I2)	-	Compliant
		1	517868 (I2)	-	Compliant
		1	517869 (I2)	-	Compliant
		1	517870 (I2)	-	Compliant
	Flaming of Fallen Particle Exceeding 10s?	3	435852 (I4)	-	Compliant
		3	521502 (I2)	-	Compliant
		1	514730 (I2)	-	Compliant
		1	514731 (I2)	-	Compliant
		1	514732 (I2)	-	Compliant
		1	514733 (I2)	-	Compliant
		1	517868 (I2)	-	Compliant
		1	517869 (I2)	-	Compliant
		1	517870 (I2)	-	Compliant
EN ISO 1716 Individual component results	510383 – London White Brick (Hard White)	3		0.2 MJ/kg	-
	510384 – Karma White Brick (Soft White)	3		0.3 MJ/kg	-
	435488 – Red Brick (Medium)	3		0.2 MJ/kg	-
	510385 – Westminster Blue Black Brick (Hard Black)	3		0.4 MJ/kg	-
	510387 – Graphite Black Brick (Soft Black)	3		0.2 MJ/kg	-

	510680 – Red Mortar	3	0.3 MJ/kg	-
	510681 (I2) – Black Mortar	3	0.4 MJ/kg	-
	510682 – White Mortar	3	0.3 MJ/kg	-
	435487 – Historic mortar	3	-0.1 MJ/kg	-
	435489 - Adhesive	3	6.7 MJ/kg	-
	437113 – Cement Board	3	2.4 MJ/kg	-
EN ISO 1716 Worst case composite calculation	Brick Slip - PCS (a)	3	0.4 MJ/kg	-
	Adhesive – PCS (d)	3	3.4 MJ/m^2	-
	Mortar – PCS (a)	3	0.4 MJ/kg	-
	Cement Board – PCS (a)	3	2.4 MJ/kg	-
	For the product as a whole PCS (e)	Summary result	1.6 MJ/kg	-

4. Test results and field of application

4.1 Definition of Limits of Extended Application

A total of two formal and seven indicative tests were conducted in accordance with EN 13823 and eleven formal tests were conducted in accordance with EN ISO 1716. In order to investigate the aforementioned variables, the assessment of this product family was conducted as follows:

Formal ISO 1716 tests:
Brick Types:

- White colour, hard brick - 510383
- White colour, soft brick – 510384
- Red colour - 435488
- Black colour, hard brick - 510385
- Black colour, soft brick – 510387

Mortar Colours:

- Red - 510680
- Black – 510681 (I2)
- White – 510682
- Historic - 435487

Other:

- Adhesive – 435489
- Cement board - 437113

Appropriate calculations were performed, with the worst performing components in each case, to provide the overall worst case result.

Initially testing was performed on a red brick system with a natural coloured mortar (435852), and the results from this test were detailed in classification report 435658 (Issue 2).

Further testing was then undertaken in order to expand the field of application to cover a range of brick colours, compressive strengths, and mortar colours.

In order to expand the field of application initially indicative EN 13823 tests were conducted as follows, utilising “Natural” coloured mortar as used in the initial EN 13823 test:

- London White (Hard) brick – 514730 (I2)
- Karma White (Soft) brick – 514731 (I2)
- Westminster Blue Black (Hard) brick – 514732 (I2)
- Graphite Black Stock (Soft) brick – 514733 (I2)

These tests and the original red brick test (435852 (I4)) determined that the worst case brick colour was the Graphite Black Stock (Soft) brick, and so this brick type was used in further testing to investigate the effect of changing the mortar colour on the performance of the product.

Graphite Black Stock (Soft) brick:

- Black Mortar – 517868 (I2)
- Red Mortar – 517869 (I2)
- White Mortar – 517870 (I2)

This determined that the performance of the Graphite Black brick with the Black mortar was worse overall, so the formal test was completed on this configuration and reported under 521502 (I2).

4.2 EN 13823

The SBI test measures the following fire parameters, Fire Growth Rate (FIGRA), Total Heat Release (THR600s), Smoke Growth Rate (SMOGRA) and Total Smoke Production (TSP600s).

These parameters were evaluated to assess what influence the product variations have on the fire performance of “FastClad A2”, a family of brick slip rainscreen cladding products. This evidence is shown in Figures 1 and 2.

The highest FIGRA value was at least 93% below the maximum value allowed for Class A2, (EN 13501-1). The highest THR600s value was at least 84% below the maximum value allowed for Class A2, (EN 13501-1).

The measured results relating to smoke parameters, SMOGRA and TSP600s, also fall within the s1 criteria, with the highest smoke value being approximately 60% below the maximum allowed for s1, (EN 13501-1).

In no instance were flaming droplets/particles in evidence during the fire tests.

4.3 EN ISO 1716

Each component of the products was tested formally in accordance with ISO 1716. Where a product was available in different colours, the lightest, darkest and reddest (ie white, black and red) colours were also tested. A calculation was performed on the system utilising the results from the worst performing components to determine the worst case result. All components and the systems as a whole were determined to be compliant with the requirements for A2 classification (EN 13501-1).

4.4 Reference of extended application process

This extended application process has been carried out in accordance with BS EN 15725: 2010 and EN/TS 15117: 2005.

4.5 Extended Field of application

This extended application is valid for the following end use applications:

i) Construction applications, mechanically fixed on steel rails, with an air gap of 40mm or greater over any substrate with a density equal to or greater than 652.5kg/m^3, having a minimum thickness of 9mm and a fire performance of A2-s1,d0 or better (excluding paper faced gypsum plasterboard).
ii) No joints permitted

This extended application is also valid for the following product parameters:

Product thickness	32mm ± 3mm
Product weight per unit area	53kg/m^2 ± variation arising from brick slip manufacturing tolerance (± 3mm)
Brick type	Clay bricks manufactured to EN 771-1
Brick colour	Any
Brick compressive strength	7 N/mm^2 to 125 N/mm^2
Mortar type	Lime mortar (as tested)
Mortar colour	Any
Product composition	No variation allowed
Product construction	No variation allowed

All products as described in Section 2.1 and within the field of application as defined in Section 4.5 can be considered to obtain reaction to fire test results that comply with the following:

Test method	Parameter	Results

		Continuous parameter Mean	Compliance parameter
EN 13823	FIGRA $_{0.2MJ}$ (W/s)	≤120	-
	FIGRA $_{0.4MJ}$ (W/s)	-	-
	THR $_{600s}$ (MJ)	≤7.5	-
	LFS	-	Compliant
	SMOGRA (m^2/s^2)	≤30	-
	TSP_{600s} (m^2)	≤50	-
	Droplets / particles <10s	-	Compliant for d_0
	Droplets / particles >10s	-	Compliant for d_0
EN ISO 1716	PCS (a) (MJ/kg)	≤3.0	-
	PCS (d) (MJ/m^2)	≤4.0	-
	PCS (e) (MJ/kg)	≤3.0	-
(a) For homogeneous products and substantial components of non-homogeneous products (d) For any internal non-substantial component of non-homogeneous products (e) For the product as a whole - Not applicable			

5. Limitations

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

SIGNED

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Katie Williams
Product Assessor
Technical Department

APPROVED

.....

Stacey Deeming
Principal Product Assessor
Technical Department
on behalf of Warringtonfire

Figure 1 - Effect of varying the product specification on FIGRA and TSP600s

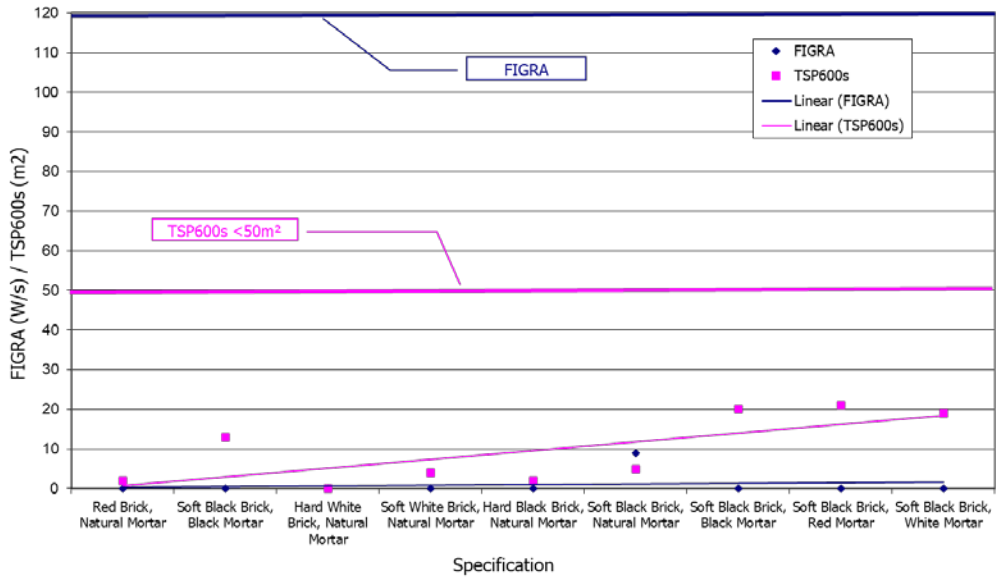

Figure 2 - Effect of varying the product specification on THR600s and SMOGRA