Reaction to fire test report

Issuing laboratory: Warringtonfire Testing and Certification Limited

Test standard:	EN 13823:2020
Test sponsor(s):	The Millboard Company Ltd
Product(s):	Shadow Line+ Cladding
Report number:	525580
Version:	1

Quality management

Version	Date	Summary of amendments including reasons		
1	27 January 2023	Description	Initial issue	
			Prepared by	Authorised by
		Name	Hannah Harper	Chris Jacques
		Signature		
			*Signed for and on behalf of Warringtonfire Testing and Certification Limited	

Contents

1. Introduction

This report documents the findings of the reaction to fire test of “Shadow Line+ Cladding” in accordance with EN 13823:2020.

Warringtonfire Testing and Certification Limited (Warringtonfire) performed the test on 09 December 2022 at the request of the test sponsor listed in Table 1.

Table 1 Test sponsor details

Entity	Address
Test sponsor	
The Millboard Company Ltd	Ryton Lodge, Oxford Road Coventry, Warwickshire CV8 3EJ United Kingdom

2. Test specimens

The description of the test specimens is detailed in Table 2. Unless otherwise specified:

- The information including measurements was provided by the test sponsor.
- All measurements taken by Warringtonfire are clearly identified.

Table 2 Test specimen description

Item		Detail
General description		Millboard shadow line+ cladding, fixed through the tongue to treated timber battens with Millboard corner profiles and aluminium trims
Product reference of coating system		“Shadow Line+ Cladding”
Name of manufacturer		The Millboard Company Limited
Overall thickness		18mm (stated by sponsor) 16.11mm (determined by Warringtonfire)
Overall weight per unit area		12kg/m^2 (stated by sponsor) 10.84kg/m^2 (determined by Warringtonfire)
Coating	Generic type	UV stable 2K coated elastomer layer
	Product reference	See Note 1 below
	Name of manufacturer	The Millboard Company Limited
	Colour	Limed Oak
	Thickness	3mm
	Weight per unit area	3.5kg/m^2
	Flame retardant details	See Note 2 below
	Curing process	See Note 2 below

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Item		Detail
Core	Generic type	Blend of natural minerals bonded in a polymer resin, with long fibre reinforcement
	Product reference	See Note 1 below
	Name of manufacturer	The Millboard Company Limited
	Colour	Grey
	Thickness	15mm
	Weight per unit area	8.5kg/m^2
	Flame retardant details	See Note 1 below
Breather membrane	Generic type	Vapour permeable underlay
	Product reference	See Note 1 below
	Name of manufacturer	See Note 1 below
	Colour	See Note 1 below
	Thickness	See Note 1 below
	Weight per unit area	See Note 1 below
	Type of weave / cell dimensions	See Note 1 below
	Flame retardant details	See Note 1 below
Sheathing board	Generic type	Sheathing board
	Product reference	“OSB”
	Name of manufacturer	See Note 1 below
	Thickness	12mm
	Density	See Note 1 below
	Flame retardant details	See Note 1 below
Fixing details		
Timber battens	Generic type	Treated timber battens at max 600mm centres
	Product reference	“Treated timber battens”
	Timber species	See Note 1 below
	Thickness	25mm
	Density / weight per unit area	See Note 1 below
	Name of manufacturer / supplier	See Note 1 below
	Flame retardant details	See Note 1 below
	Cycle details	See Note 1 below
Joint details		This was tested with the sample arranged in the vertical orientation.

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Mounting and Fixing Details	The specimens were tested with a 12mm thick calcium silicate backing board, having a density of 870kg/m³ as defined in EN 13238:2010 butted up against the reverse face of the specimen
Brief description of manufacturing process	Products are made through a layering process in wood-grained moulds, before being machined to form the finished profile.

Note 1: The sponsor was unable to provide this information.

Note 2: The sponsor was unwilling to provide this information.

Test procedure

Table 3 details the test procedure for this reaction to fire test.

Table 3 Test procedure

Item	Detail
Test standard	The test was performed in accordance with EN 13823:2020.
Supplementary standard	EN 13501: 2018
Deviations from the test standard	None
Product standard and/or EAD	The client did not provide an instruction to work in accordance with a product standard.
EGOLF agreements and/or recommendations	None
Pre-test conditioning	Test specimens received on 14 November 2022.
	Before testing, the test specimens were conditioned in accordance with the requirements of EN 13238:2010 at a temperature of 23 ± 2 °C and a relative humidity of 50 ± 5% for a minimum period of 48 hours, until constant mass was achieved.
Sampling / test specimen selection	The test specimens were sampled by the test sponsor. Warringtonfire was not involved in any selection or sampling procedure.
Test face	The coated face of the test specimens was exposed to the heating conditioning of the test when the test specimens were mounted in the test position.
Number of replicate tests	Three
Intended application	Exterior cladding
Test specimen preparation	The test specimen walls (or wings) were installed in the trolley in accordance with the requirements of section 5.3 of BS EN 13823:2020.

3. Test results and observations

3.1 Pre-test conditions

Table 4 details pre-test conditions.

Table 4 Pre-test conditions

Parameter	Unit	Value		
		Specimen 1	Specimen 2	Specimen 3
Ambient temperature	(°C)	21	14	14
Barometric pressure	Pa	100700	100700	100750
Relative humidity	%	60.2	38.4	46.5

3.2 Test results

Table 5 shows a summary of the results for the test specimens.

Table 5 Test results

Parameter	Unit	Results			
		Specimen 1	Specimen 2	Specimen 3	Mean
Test date	-	14/11/2022	09/12/2022	09/12/2022	-
Fire spread					
FIGRA (THR(t) threshold of 0.2MJ)	W/s	272	180	196	216
FIGRA (THR(t) threshold of 0.4MJ)	W/s	272	180	196	216
THR600s	MJ	20.4	14.6	13.4	16.1
Lateral flame spread to edge of test specimen?	-	No	No	No	No
Smoke production					
SMOGRA	m^2/s^2	134	105	114	118
TSP600s	m^2	668	577	557	600
Flaming droplets and particles					
Fall of flaming droplets/particles < 10s?	-	No	No	No	No
Fall of flaming droplets/particles > 10s?	-	No	No	No	No

3.3 Test observations

Table 6 shows a list of initial observations noted for every tested specimen.

Table 6 Common specimen observations

Min	Sec	Initial observations for each specimen
0	0	Pre-checks performed on analysers
2	0	Auxiliary burner switched on to check correct burner operating conditions
5	0	Gas flow switched from auxiliary burner to main burner & test flames impinge on specimen

Observations of any significant behaviour of the specimen during the tests are summarised in Table 7 below.

Table 7 Test observations

Min	Sec	Observations during test
Specimen 1		
5	21	Flaming on the surface of the test specimen occurred in the region of the burner
5	21	Discolouration of the surface of the test specimen occurred in the region of the burner
26	0	End of test conditions. All flaming ceased.
Specimen 2		
5	24	Discolouration of the surface of the test specimen occurred in the region of the burner
6	6	Flaming on the surface of the test specimen occurred in the region of the burner
26	0	End of test conditions. All flaming ceased.
Specimen 3		
5	21	Discolouration of the surface of the test specimen occurred in the region of the burner
5	57	Flaming on the surface of the test specimen occurred in the region of the burner
26	0	End of test conditions. All flaming ceased.

4. Application of test results

4.1 Validity

This document is the original version of this test report and is written in English. In case of doubt the original version prevails over a translation.

This document is issued subject to Warringtonfire's standard terms and conditions, which are available at: *Terms and Conditions | Element*.

The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use, nor can the results be extrapolated and applied to other products.

Test reports are statements of fact prepared in accordance with the referenced version of the standards stated in Section 3 of this report. Test reports are based upon the information provided to Warringtonfire. Warringtonfire takes no responsibility for the accuracy or completeness of such information.

The results stated in this report apply to the sample as received. Any differences in composition, production process, thickness, density or colour of the product may significantly affect the performance and will therefore invalidate the application of the test results to the variant product. It is recommended that any proposed variation to the tested configuration or product should be referred to the test sponsor. The test sponsor should then obtain appropriate documentary evidence of compliance from Warringtonfire or another accredited testing authority. The supplier of the product is responsible for ensuring that the product which is supplied for use is identical to the test sample as received.

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4.2 Uncertainty of measurement

The determination of the uncertainty of measurement of FIGRA, THR600s, SMOGRA and TSP600s is an ongoing topic within CEN. PD CEN/TR 16988: 2016 provides the latest work of the CEN committee tasked with working on this matter. Until this work is finalised the measurement of uncertainty is not reported.

Appendix A Test data

A.1 Heat release rate

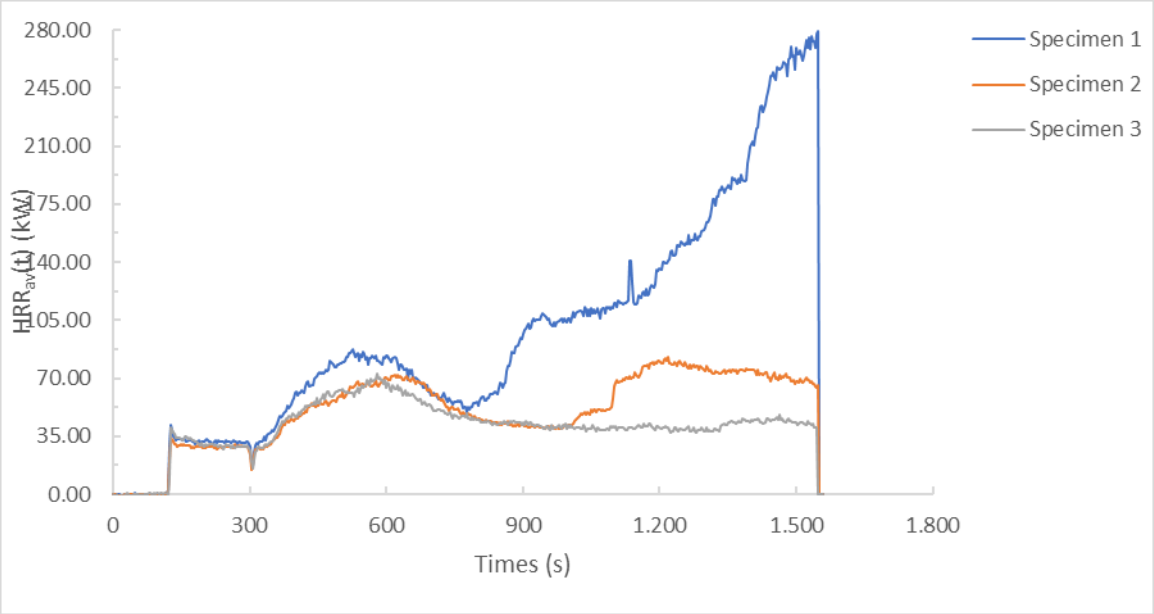

Figure 1 Heat release rate vs time

A.2 Total heat release

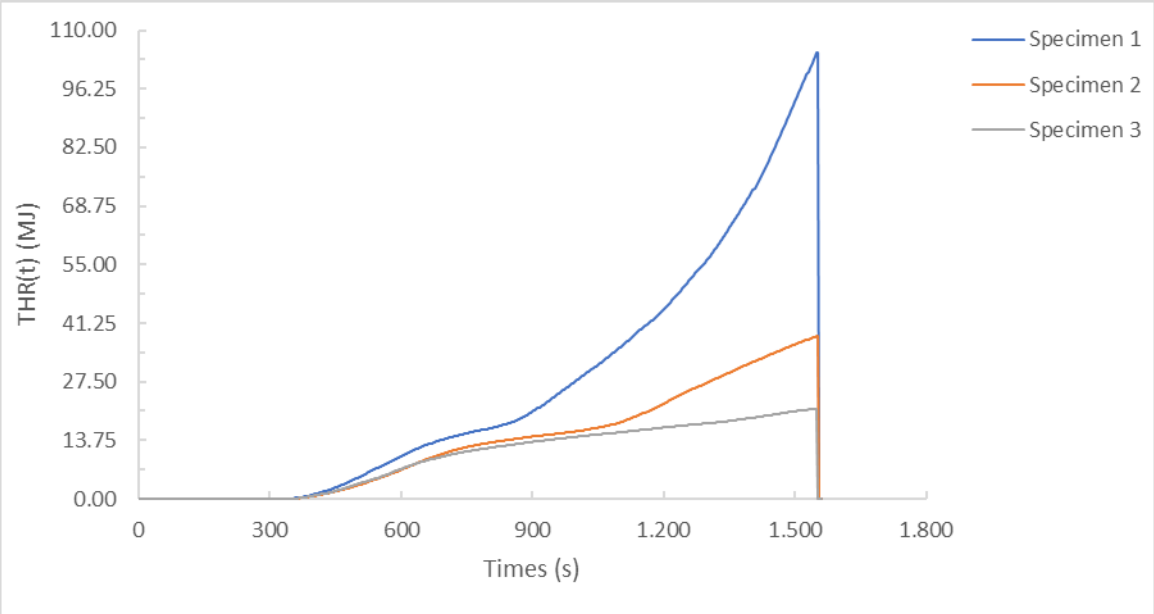

Figure 2 Total heat release vs time

A.3 1000 x HRR_{av} (t) / (t-300)

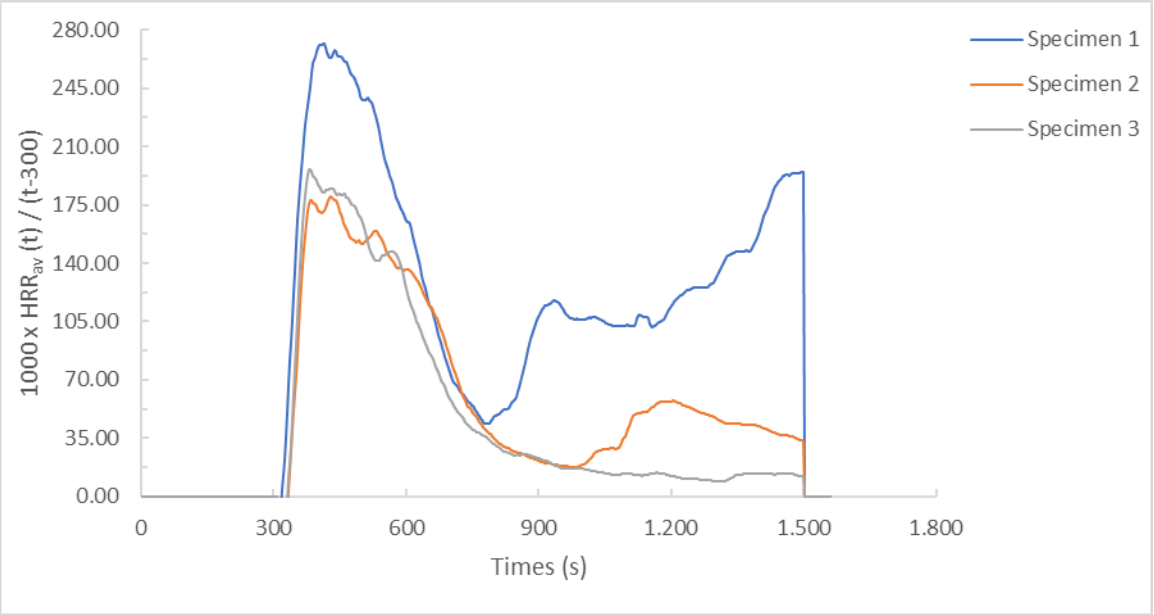

Figure 3 1000 x HRR_{av} (t) / (t-300) vs time

A.4 Smoke production rate

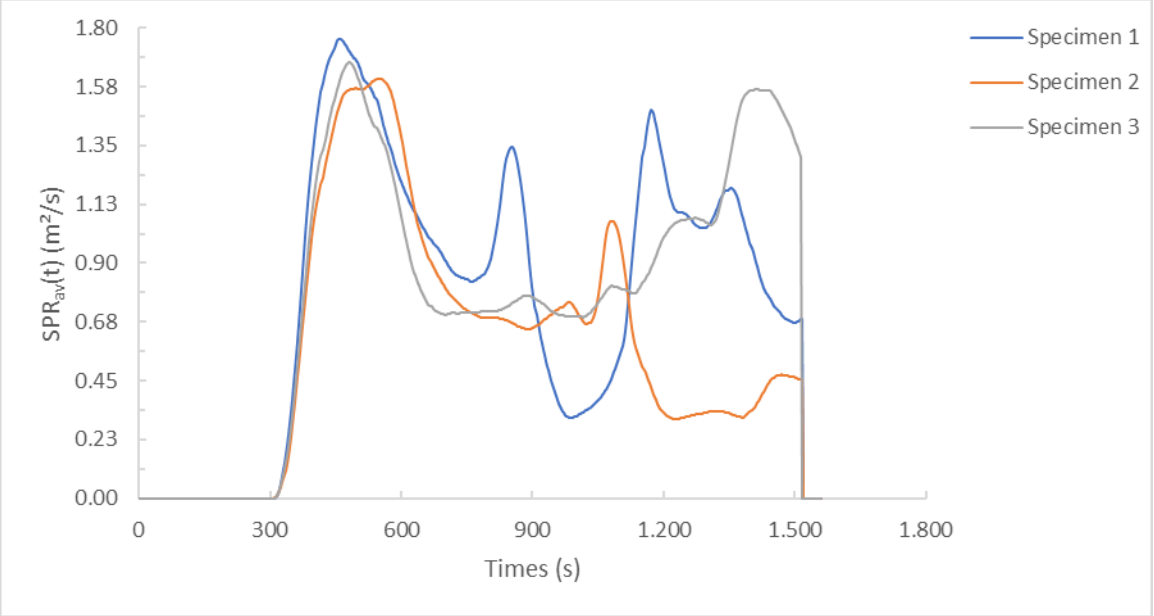

Figure 4 Smoke production rate vs time

A.5 Total smoke production

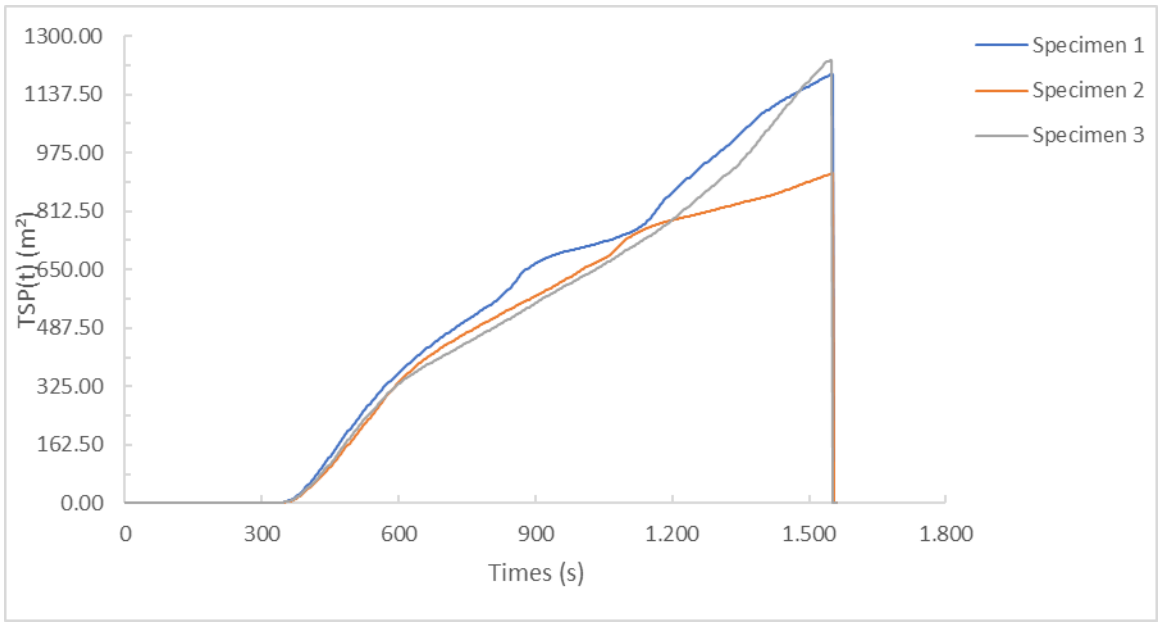

Figure 5 Total smoke production vs time

A.6 10000 x SPR_{av} (t) / (t-300)

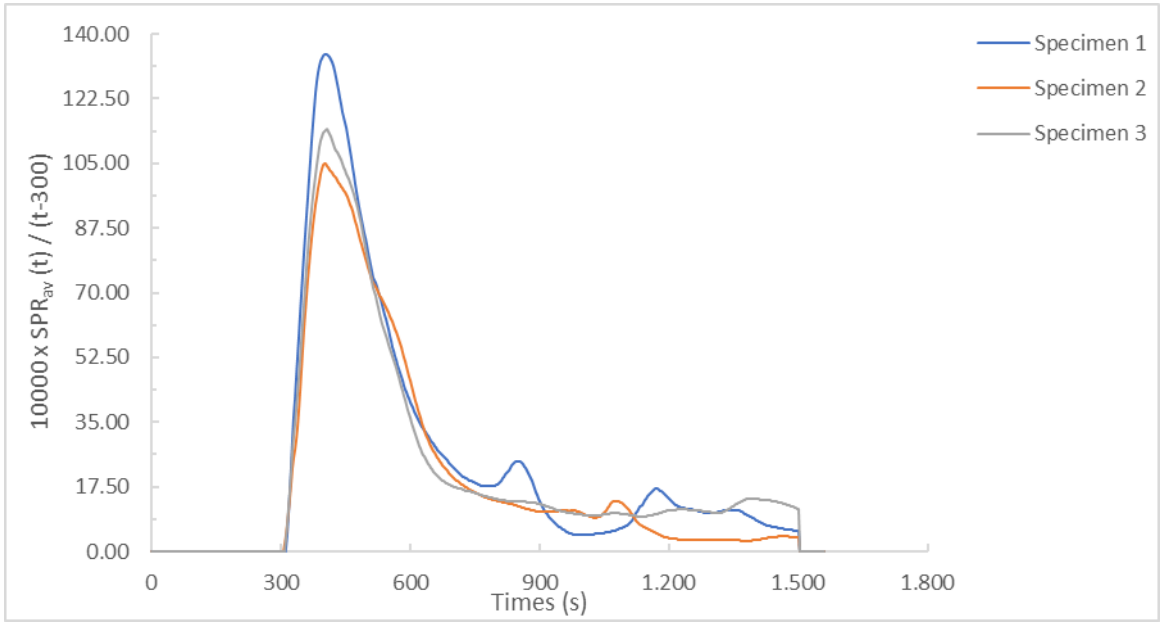

Figure 6 10000 x SPR_{av} (t) / (t-300) vs time

Appendix B Test specimen photographs

Figure 7: Total view of the exposed surface of the long wing prior to testing

Figure 8: Close up view of the vertical outer edge of the long wing at a height of 500mm prior to testing

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