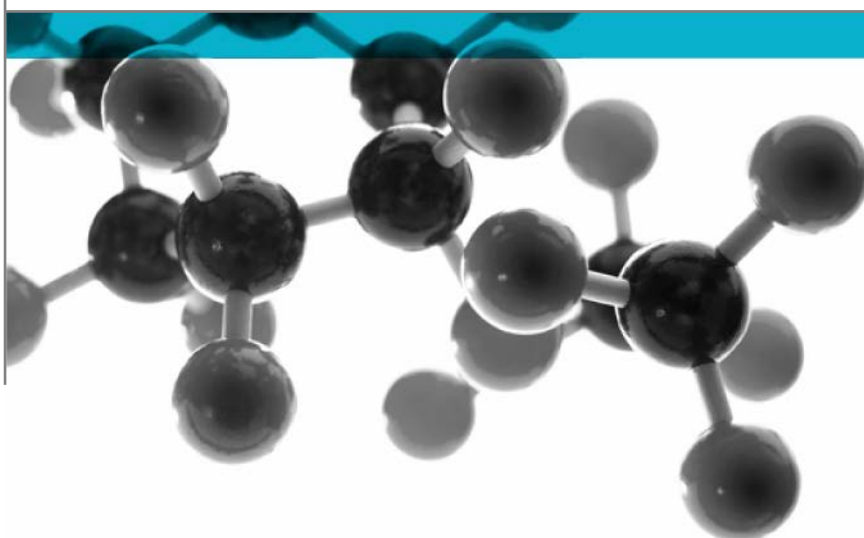


# BS EN 13823:2020



## Reaction to Fire Tests for Building Products - Building Products Excluding Floorings Exposed to the Thermal Attack by a Single Burning Item

A Report To: Licata Building Systems Ltd

Document Reference: 502337

Date: 25th February 2022

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## Executive Summary

**Objective** To determine the fire performance of the following product when tested in accordance with BS EN 13823:2020.

Generic Description	Product reference	Thickness	Weight per unit area or density
Licatatherm insulated render system	"Licatatherm Insulated Render System"	226mm*	30kg/m <sup>2</sup>
<b>Individual components used to manufacture composite:</b>			
Render	"Licatatherm"	4mm	6g/m <sup>2</sup>
Basecoat	"Raso Top 800"	4mm	7.2kg/m <sup>2</sup>
Mesh	"Licatatherm Mesh 160"	2mm	160.4g/m <sup>2</sup>
Basecoat primer	"Isolante"	1mm	4g/m <sup>2</sup>
Insulation	"Rockwool DD External EWI Slab"	100mm	14.8kg/m <sup>2</sup>
Fixings	"SW8-R"	4.8mm diameter	2.2kg/m <sup>2</sup>
Adhesive	"Raso Top 800"	4mm	7.2kg/m <sup>2</sup>
Substrate	"Licata Cement Fibre Board"	15mm	1200kg/m <sup>3</sup>
Metal frame	"Generic SFS characteristics galvanised steel minimum G275"	2mm thick formed into a frame with a depth of 100mm	Unwilling to provide
*determined by <a href="#">Warringtonfire</a>			
<b>Please see page 6 &amp; 7 of this test report for the full description of the product tested</b>			

**Test Sponsor** Licata Building System Ltd, Unit 6 Hampton Business Park, Bolney Way, Twickenham, TW13 6DB

**Test Results (average) :**

FIGRA (w/s)		THR 600s (MJ)	SMOGRA (m <sup>2</sup> /s <sup>2</sup> )	TSP 600s (m <sup>2</sup> )
(0.2MJ)	(0.4MJ)	<b>2.04</b>	Recalculated	Recalculated
<b>30.38</b>	<b>29.22</b>		<b>0.97</b>	<b>35.23</b>

Lateral Flame Spread to End of Specimen? **None**  
Fall of Flaming Drop/Particle? **None**  
Flaming of Fallen Particle Exceeding 10s? **None**

**Date of Test:** 21<sup>st</sup> April & 18<sup>th</sup> June 2021

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## Signatories

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Responsible Officer G. Morris* Testing Officer


Authorised L. Berry * Technical Officer

\* For and on behalf of [Warringtonfire](#).

Report Issued: 25th February 2022
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## Test Details

<b>Purpose of test</b>	To provide data which, in conjunction with data from other test methods, will enable building products excluding floorings, to be classified in accordance with the Classification requirements specified in BS EN 13501-1:2018. The test was performed in accordance with the procedure specified in BS EN 13823:2020 and this report should be read in conjunction with that standard.
<b>Scope of test</b>	To determine the reaction-to-fire performance of construction products, excluding floorings and excluding products which are indicated in the EC Decision 2000/147/EC, when exposed to thermal attack by a single burning item (SBI) utilising the test procedures defined in BS EN 13823:2020.
<b>Fire test study group/EGOLF</b>	Certain aspects of some fire test specifications are open to different interpretations. The Fire Test Study Group and EGOLF have identified a number of such areas and have agreed Resolutions which define common agreement of interpretations between fire test laboratories which are members of the Groups. Where such Resolutions are applicable to this test they have been followed.
<b>Instruction to test</b>	The test was conducted on the 21 <sup>st</sup> April & 18 <sup>th</sup> June 2021 at the request of Licata Building Systems Ltd, the sponsor of the test.
<b>Provision of test specimens</b>	The specimens were supplied by the sponsor of the test. <a href="#">Warringtonfire</a> was not involved in any selection or sampling procedure. The results stated in this report apply to the sample as received.
<b>Conditioning of specimens</b>	The specimens were received on the 12 <sup>th</sup> March & 15 <sup>th</sup> June 2021 and were conditioned to constant mass at a temperature of $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $50 \pm 5\%$ prior to testing.
<b>Intended application</b>	External thermal insulation system.
<b>Test facility</b>	The Single Burning Item (SBI) test facility at <a href="#">Warringtonfire</a> is constructed in accordance with the specifications detailed in BS EN 13823: 2020.
<b>Deviations from the test standard</b>	None.
<b>Exposed face</b>	The render face of the specimens was exposed to the heating conditions of the test when the specimens were mounted in the test position.

## Description of Test Specimens

### Test specimens

The description of the system given below has been prepared from information provided by the sponsor of the test. This information has not been independently verified by [Warringtonfire](#).

All values quoted are nominal, unless tolerances are given.

The test specimen comprised two walls (or wings) mounted into an aperture in a specimen trolley such that they formed a vertical 90° corner. The dimensions of the walls were as follows:

Short wall	-	495 ± 5 mm long x 1500 ± 5 mm high
Long wall	-	1000 ± 5 mm long x 1500 ± 5 mm high

Each wall (or wing) consisted of the following product:

General description		Licatatherm insulated render system
Product reference of overall composite		"Licatatherm Insulated Render System"
Name of manufacturer of overall composite		Licata
Thickness of overall composite		226mm (determined by <a href="#">Warringtonfire</a> )
Weight per unit area of overall composite		30kg/m <sup>2</sup>
Render	Generic type	Insulated render
	Product reference	"Licatatherm"
	Name of manufacturer	Licata
	Colour	"White" (as observed by <a href="#">Warringtonfire</a> )
	Thickness	4mm (determined by <a href="#">Warringtonfire</a> )
	Weight per unit area	6g/m <sup>2</sup>
	Flame retardant details	<b>See Note 2 below</b>
Basecoat	Generic type	A fibre-reinforced mineral adhesive/skim coating made with hydraulic binders, polymer-modified resins, selected inert materials and latest-generation additives.
	Product reference	"Raso Top 800"
	Name of manufacturer	Licata S.p.A.
	Weight per unit area	7.2kg/m <sup>2</sup>
	Thickness	4mm
	Curing process	36-48 hours
	Flame retardant details	<b>See Note 2 below</b>
Mesh	Generic type	Fibreglass mesh
	Product reference	"LicataTherm Mesh 160"
	Name of manufacturer	Licata
	Weight per unit area	160.4 g/m <sup>2</sup>
	Thickness	2mm
	Flame retardant details	<b>See Note 2 below</b>

Continued on next page

Basecoat Primer	Generic type	Primer
	Product reference	"Isolante"
	Name of manufacturer	Licata
	Weight per unit area	4gm <sup>2</sup>
	Thickness	1mm
	Curing process	12 Hours
	Flame retardant details	<b>See Note 2 below</b>
Insulation	Generic type	Mineral Wool
	Product reference	"Rockwool DD External EWI Slab"
	Name of manufacturer	Rockwool
	Thickness	100mm
	Weight per unit area	14.8kgm <sup>2</sup>
	Flame retardant details	<b>See Note 2 below</b>
Fixings	Generic type	Minimum Self-Screwing High quality grade casehardened carbon steel to DIN standard 7504.
	Product reference	"SW8-R"
	Name of manufacturer	Ejot
	Colour reference	<b>See Note 1 below</b>
	Flame retardant details	<b>See Note 2 below</b>
Adhesive	Generic type	A fibre-reinforced mineral adhesive/skim coating made
	Product reference	"Raso Top 800"
	Name of manufacturer	Licata S.p.A.
	Weight per unit area	7.2kg/m <sup>2</sup>
	Thickness	4mm
	Curing process	36-48 hours
	Flame retardant details	<b>See Note 2 below</b>
Substrate	Product reference	"Licata Cement Fibre Board"
	Generic type	Cement Fibre Board
	Name of manufacturer	Tepe Betopan
	Thickness	12mm
	Density	1200kg/m <sup>3</sup>
	Flame retardant details	<b>See Note 2 below</b>
Metal Frame	Product reference	<b>See Note 1 below</b>
	Generic type	<b>See Note 1 below</b>
	Name of manufacturer	<b>See Note 1 below</b>
	Thickness	2mm thick formed into a frame with a depth of 100mm
	Density	<b>See Note 1 below</b>
	Flame retardant details	This component is inherently flame retardant
Mounting and fixing details		The specimens were tested with a 12mm thick calcium silicate backing board, having a density of 870kg/m <sup>3</sup> as defined in EN 13238:2010 butted up against the reverse face of the specimen
Brief description of manufacturing process		<b>See Note 1 below</b>

**Note 1: The sponsor was unwilling to provide this information.**

**Note 2: The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the component.**

The specimen walls (or wings) were placed in the trolley in accordance with the requirements of section 5.3 of the Standard.

Photographs of the installed product are appended as Plates 1 and 2 in Appendix 1 of this report.

Each wing was retained in the trolley using mechanical clamps which pushed the wing against a lip at the top and bottom of the aperture in the trolley.

The trolley incorporated a triangular propane sand burner of side length 250mm, which was positioned in the base of the corner formed by the two wings of the test specimen, with a horizontal separation of 40mm between the edge of the burner and the lower edges of the wings. The burner is referred to as the primary burner and has an output of 30kW. A secondary propane sand burner was attached to the fixed frame, beneath the hood but at the furthest possible distance from the specimen when the trolley was in place. The purpose of this burner is to obtain base line data without affecting the assembled specimen. The trolley incorporated a grill in its base and this was the sole source of ventilation for the test enclosure whilst the test was in progress.



## Test Results

### Results and observations

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.

The test results relate only to the specimens of the product in the form in which they were tested. Small differences in the composition or thickness of the product may significantly affect the performance during the test and may therefore invalidate the test results. Care should be taken to ensure that any product which is supplied or used is fully represented by the specimens which were tested.

A total of three specimens were tested. The results obtained, relevant to the 'Euroclassification' of Building Products are given in Table 1.

Observations made during the test and comments on any difficulties encountered during the test are given in Table 2.

**Table 1**

Parameter	Result			
	Specimen 1	Specimen 2	Specimen 3	Mean
FIGRA (W/s) ( <i>THR(t) threshold of 0.2MJ</i> )	34.08	33.57	23.50	30.38
FIGRA (W/s) ( <i>THR(t) threshold of 0.4MJ</i> )	32.33	32.61	22.72	29.22
THR 600s (MJ)	2.34	1.96	1.83	2.04
SMOGRA (m <sup>2</sup> /s <sup>2</sup> ) (Recalculated results)	0.00	0.00	2.91	0.97
TSP 600s (m <sup>2</sup> ) (Recalculated results)	32.50	31.46	41.74	35.23
Lateral Flame Spread to End of Specimen?	None	None	None	-
Fall of Flaming Drop/Particle?	None	None	None	-
Flaming of Fallen Particle Exceeding 10s?	None	None	None	-

Curves of time averaged rate of heat release contribution of the specimen (HRRav(t)), cumulative heat release (THR(t)), and Fire Growth Rate (FIGRA) are appended as Figures 1 to 3. Curves of time averaged rate of smoke production (SPRav(t)), cumulative smoke production (TSP(t)) and smoke growth rate (SMOGRA) are appended as Figures 4 to 6 in appendix 2 of this report.

Interpretation of the test results given above in the context of Euroclassification of building products should be carried out using BS EN 13501-1:2018.

The determination of the uncertainty of measurement of FIGRA, THR<sub>600s</sub>, SMOGRA and TSP<sub>600s</sub> 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.

Table 2

Time		Observations during test of Specimen 1
min	Sec	
00	00	Pre-checks performed on analysers
02	00	Auxiliary burner switched on to check correct burner operating conditions
05	00	Gas flow switched from auxiliary burner to main burner & test flames impinge on specimen
05	12	Discolouration of the surface of the product occurred in the region of the burner.
07	21	Flaming occurred in the region of the burner.
26	00	End of test conditions. All flaming ceased.

Time		Observations during test of Specimen 2
min	Sec	
00	00	Pre-checks performed on analysers
02	00	Auxiliary burner switched on to check correct burner operating conditions
05	00	Gas flow switched from auxiliary burner to main burner & test flames impinge on specimen
05	12	Discolouration of the surface of the product occurred in the region of the burner.
07	21	Flaming occurred in the region of the burner.
26	00	End of test conditions. All flaming ceased.

Time		Observations during test of Specimen 3
min	Sec	
00	00	Pre-checks performed on analysers
02	00	Auxiliary burner switched on to check correct burner operating conditions
05	00	Gas flow switched from auxiliary burner to main burner & test flames impinge on specimen
05	12	Discolouration of the surface of the product occurred in the region of the burner.
07	27	Flaming occurred in the region of the burner.
26	00	End of test conditions. All flaming ceased.

Note: Impingement of the burner flame onto all three specimens commenced at 5 minutes.

### Validity

The specification and interpretation of fire test methods is 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 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 to ensure that they are consistent with current practices, and if required may endorse the test report.

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## Appendix 1

### Photographs

Plate 1: Total View of the exposed surface of the long wing.



Plate 2: Close up view of the vertical outer edge of the long wing at a height of 500mm



## Appendix 2

### Graphs

Figure 1.  $HRR_{av}(t)$  (kW)

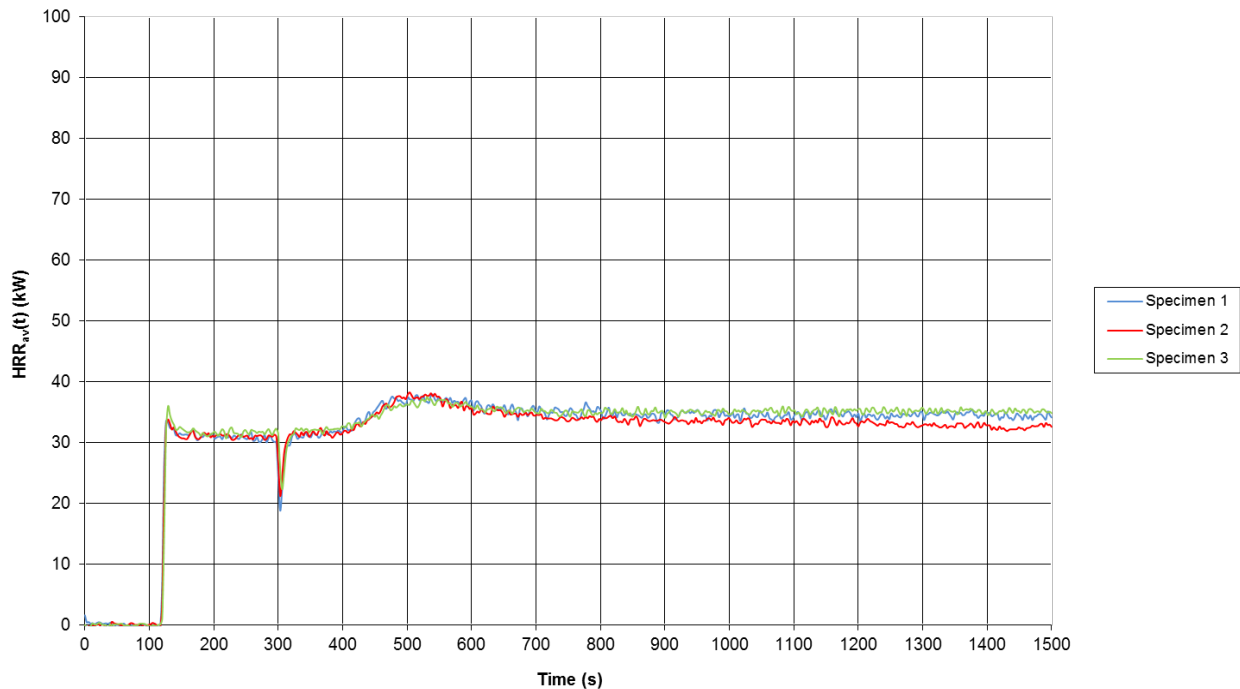


Figure 2.  $THR(t)$  (MJ)

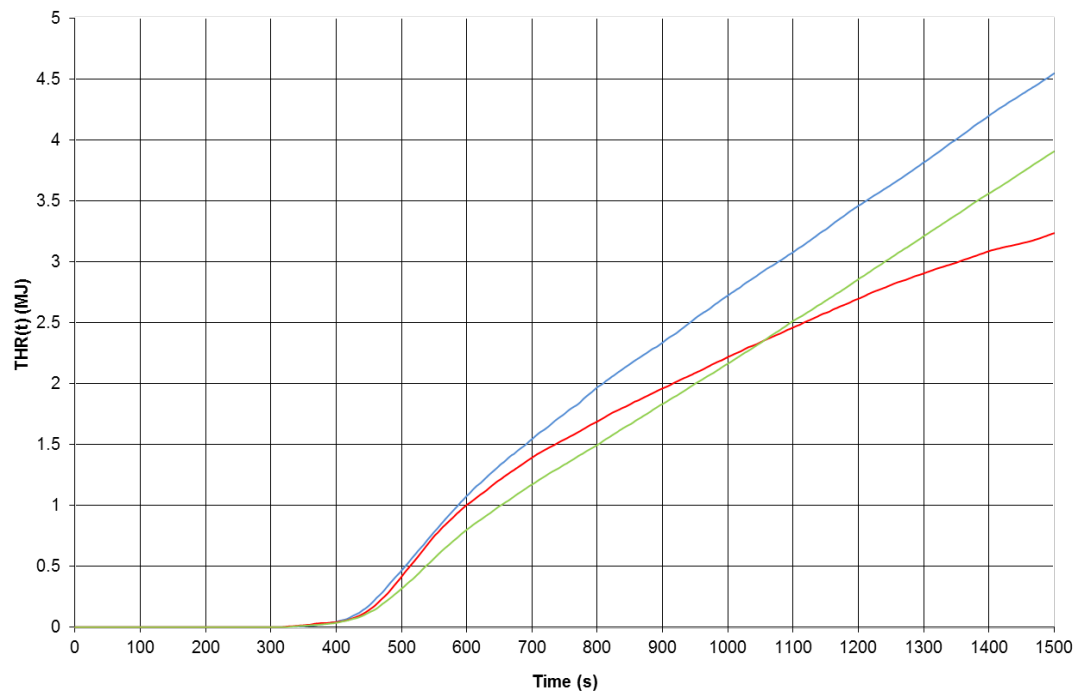


Figure 3. FIGRA

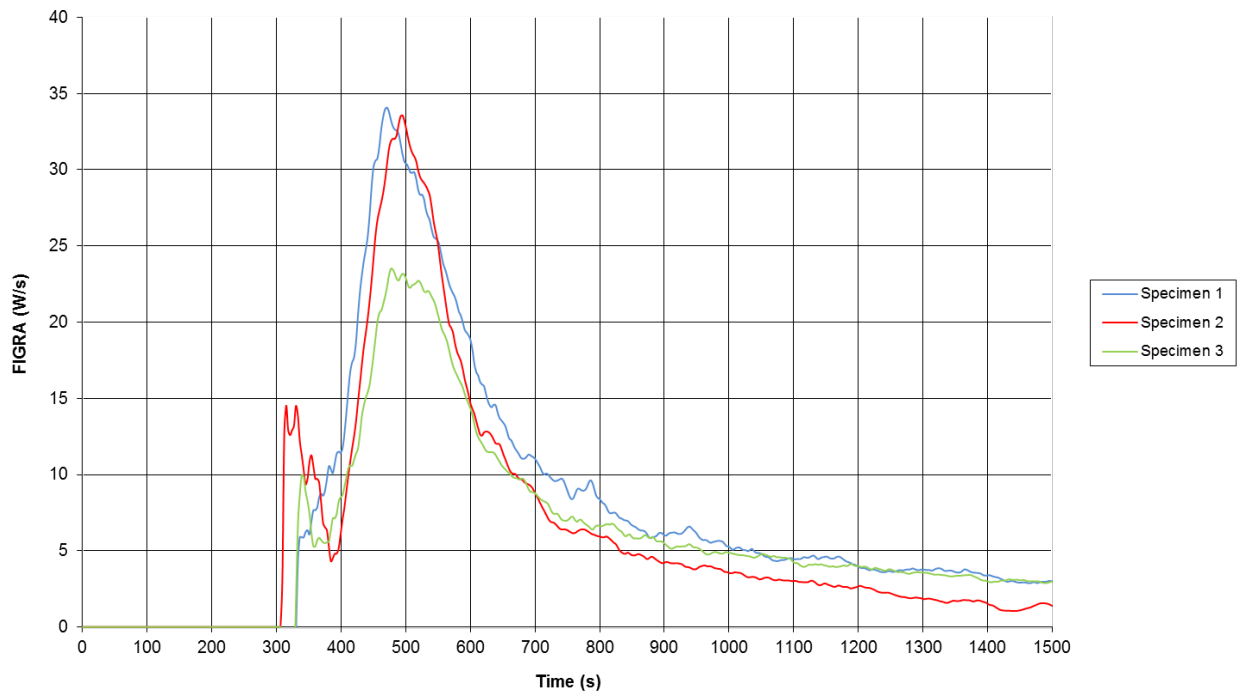
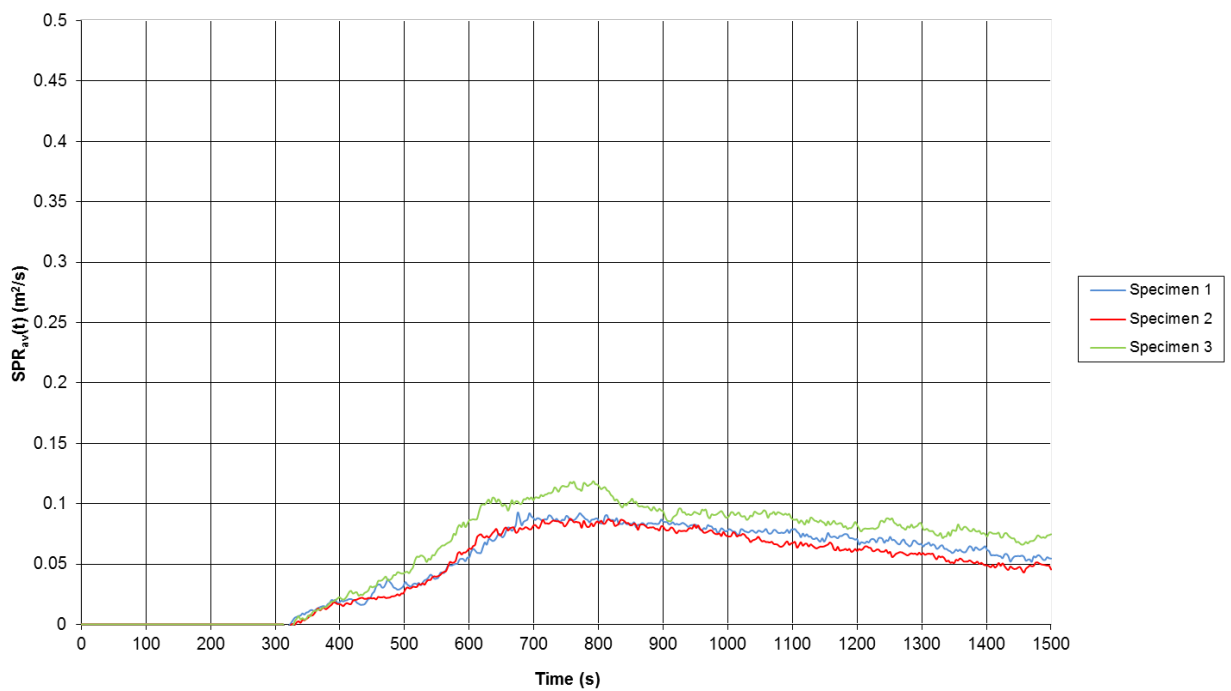
Figure 4.  $SPR_{av}(t)$  ( $m^2/s$ )

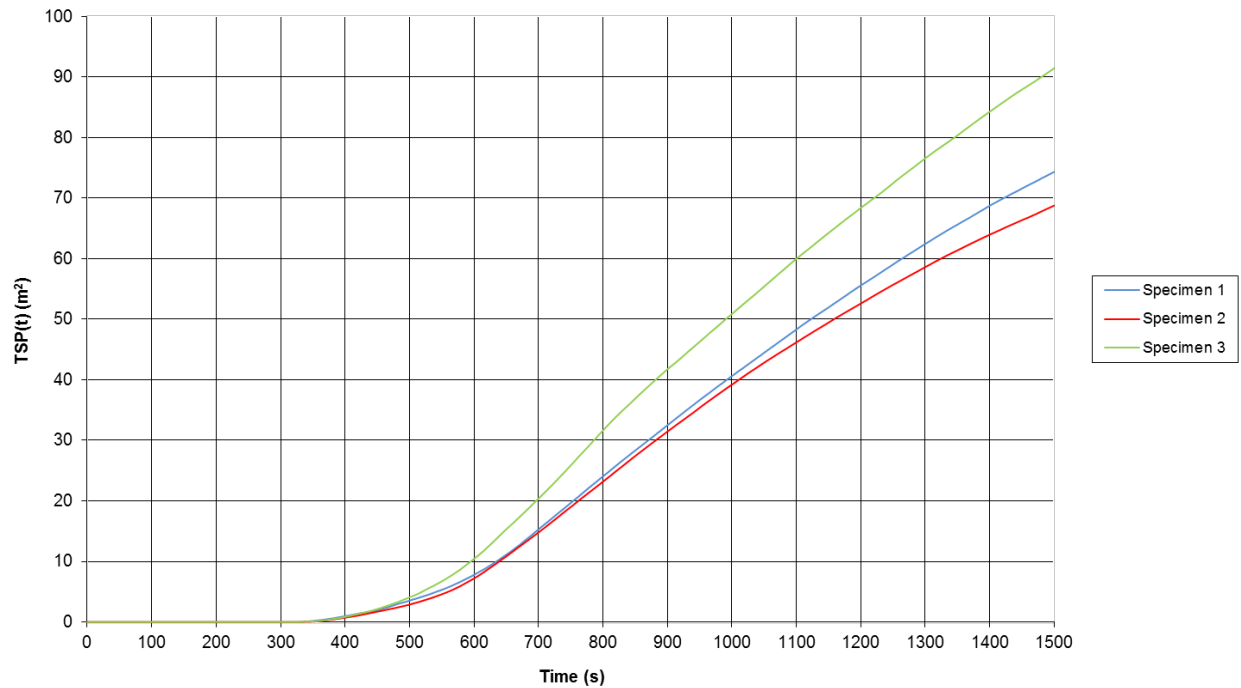
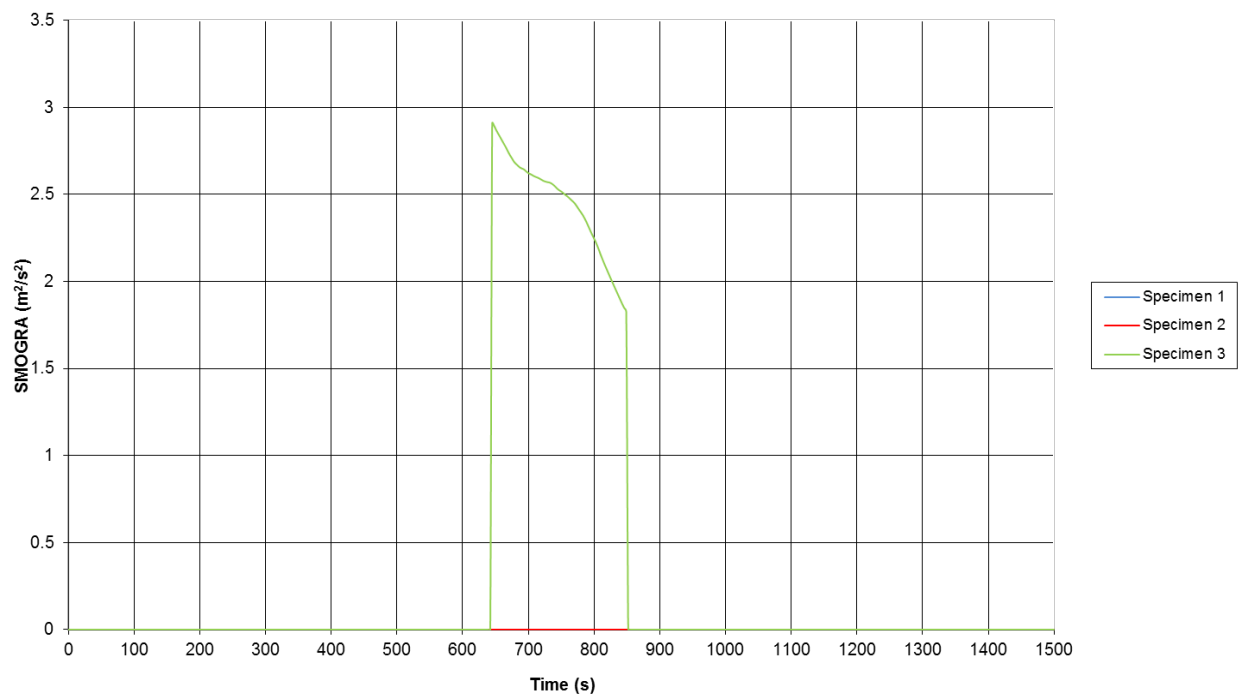
Figure 5. TSP(t) (m<sup>2</sup>)

Figure 6. SMOGRA Graph.



## Revision History

Issue No:	Re-issue Date:
Revised By:	Authorised By:
Reason for Revision:	

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