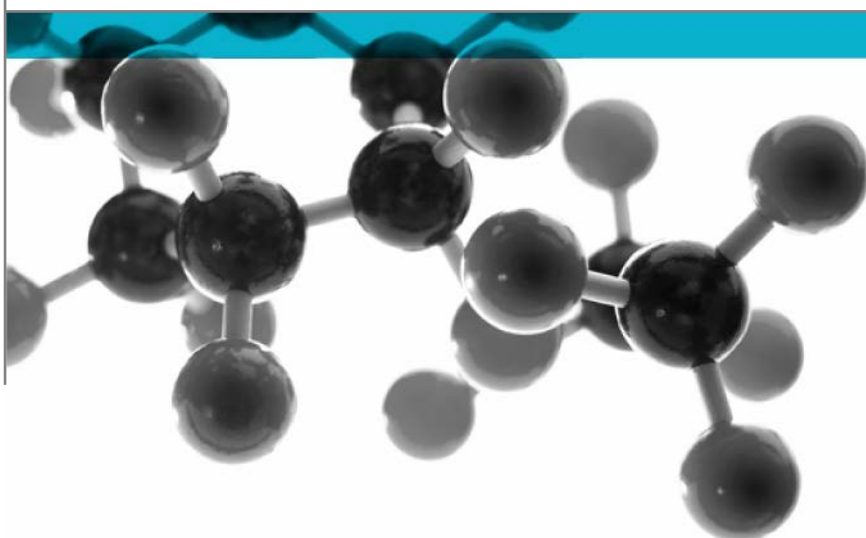


BS EN 13823:2020



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: 502340

Date: 25th February 2022

Issue No.: 1

Page 1



0249

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 clay brick slip system	"Licatatherm Clay Brick Slip System"	238mm	60kg/m ²
Individual components used to manufacture composite:			
Brick slip	"Clay Brick Slip"	15mm	27kg/m ²
Mortar	"Pointing Mortar"	6-12mm	11kg/m ²
Basecoat	"Raso Top 800"	4mm	7.2kg/m ²
Mesh	"Licatatherm Mesh 160"	2mm	160.4g/m ²
Adhesive	"Super S1"	2mm	2.5kg/m ²
Insulation	"Rockwool DD External EWI Slab"	100mm	14.8kg/m ²
Fixings	"SW8-R"	4.8mm diameter	2.2kg/m ²
Adhesive	"Raso Top 800"	4mm	7.2kg/m ²
Substrate	"Licata Cement Fibre Board"	15mm	1200kg/m ³
Metal frame	"Generic SFS characteristics galvanised steel minimum G275,"	2mm thick formed into a frame with a depth of 100mm	Unwilling to provide
Please see page 6, 7 & 8 of this test report for the full description of the product tested			

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 ² /s ²)	TSP 600s (m ²)
(0.2MJ)	(0.4MJ)	0.30	Recalculated	Recalculated
0.00	0.00		0.00	9.49

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

Date of Test: 21st April & 18th June 2021

Signatories


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

Purpose of test	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.
Scope of test	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.
Fire test study group/EGOLF	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.
Instruction to test	The test was conducted on the 21 st April & 18 th June 2021 at the request of Licata Building Systems Ltd, the sponsor of the test.
Provision of test specimens	The specimens were supplied by the sponsor of the test. Warringtonfire was not involved in any selection or sampling procedure. The results stated in this report apply to the sample as received.
Conditioning of specimens	The specimens were received on the 12 th March & 15 th 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.
Intended application	External thermal insulation system.
Test facility	The Single Burning Item (SBI) test facility at Warringtonfire is constructed in accordance with the specifications detailed in BS EN 13823: 2020.
Deviations from the test standard	None.
Exposed face	The brick 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 clay brick slip system
Product reference of overall composite		"Licatatherm Clay Brick Slip System"
Name of manufacturer of overall composite		Licata
Thickness of overall composite		238mm (stated by sponsor)
Weight per unit area of overall composite		60kgm ² (stated by sponsor)
Brick slip	Generic type	Clay 15mm
	Product reference	"Clay Brick Slip"
	Name of manufacturer	Celina
	Colour reference	See Note 1 below
	Thickness	15mm
	Weight per unit area	27kg/m ²
	Flame retardant details	See Note 2 below
Mortar	Generic type	Lime based coloured pointing mortar
	Product reference	"Pointing Mortar"
	Name of manufacturer	Lime Green
	Weight per unit area	11kg/m ²
	Thickness	6-12mm
	Curing process	24-48 hours
	Flame retardant details	See Note 2 below
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 ²
	Thickness	4mm
	Curing process	24-48 hours
	Flame retardant details	See Note 2 below

Continued on next page

Mesh	Generic type	Fibreglass mesh
	Product reference	"LicataTherm Mesh 160"
	Name of manufacturer	Licata
	Weight per unit area	160.4 g/m ²
	Thickness	2mm
	Flame retardant details	See Note 2 below
Adhesive	Generic type	Super S1 is a high-performance, deformable, polymer-modified, cementitious adhesive, based on high-strength hydraulic binders, selected aggregates and latest-generation additives
	Product reference	"Super S1"
	Name of manufacturer	Licata
	Weight per unit area	2.5kg/m ²
	Thickness	2mm
	Curing process	Normally the tiles are laid by applying enough pressure to ensure contact with the adhesive. In normal temperature and humidity conditions, the open time of the mixture is about 30 minutes; unfavourable conditions or very absorbent substrates may drastically decrease this time
	Flame retardant details	See Note 2 below
Insulation	Generic type	Mineral Wool
	Product reference	"Rockwool DD External EWI Slab"
	Name of manufacturer	Rockwool
	Thickness	100mm
	Weight per unit area	14.8kgm ²
	Flame retardant details	See Note 2 below
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	See Note 1 below
	Flame retardant details	See Note 2 below
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 ²
	Thickness	4mm
	Curing process	24-48 hours
	Flame retardant details	See Note 2 below
Substrate	Product reference	"Licata Cement Fibre Board"
	Generic type	Cement Fibre Board
	Name of manufacturer	Tepe Betopan
	Thickness	12mm
	Density	1200kg/m ³
	Flame retardant details	See Note 2 below

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Metal Frame	Product reference	See Note 1 below
	Generic type	See Note 1 below
	Name of manufacturer	See Note 1 below
	Thickness	2mm thick formed into a frame with a depth of 100mm
	Density	See Note 1 below
	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 ³ as defined in EN 13238:2010 butted up against the reverse face of the specimen
Brief description of manufacturing process		See Note 1 below

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>)	0.00	0.00	0.00	0.00
FIGRA (W/s) (<i>THR(t) threshold of 0.4MJ</i>)	0.00	0.00	0.00	0.00
THR 600s (MJ)	0.41	0.12	0.36	0.30
SMOGRA (m ² /s ²) (Recalculated results)	0.00	0.00	0.00	0.00
TSP 600s (m ²) (Recalculated results)	15.70	5.96	6.82	9.49
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_{600s}, SMOGRA and TSP_{600s} 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	39	Discolouration of the surface of the product 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	39	Discolouration of the surface of the product 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	21	Discolouration of the surface of the product 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)

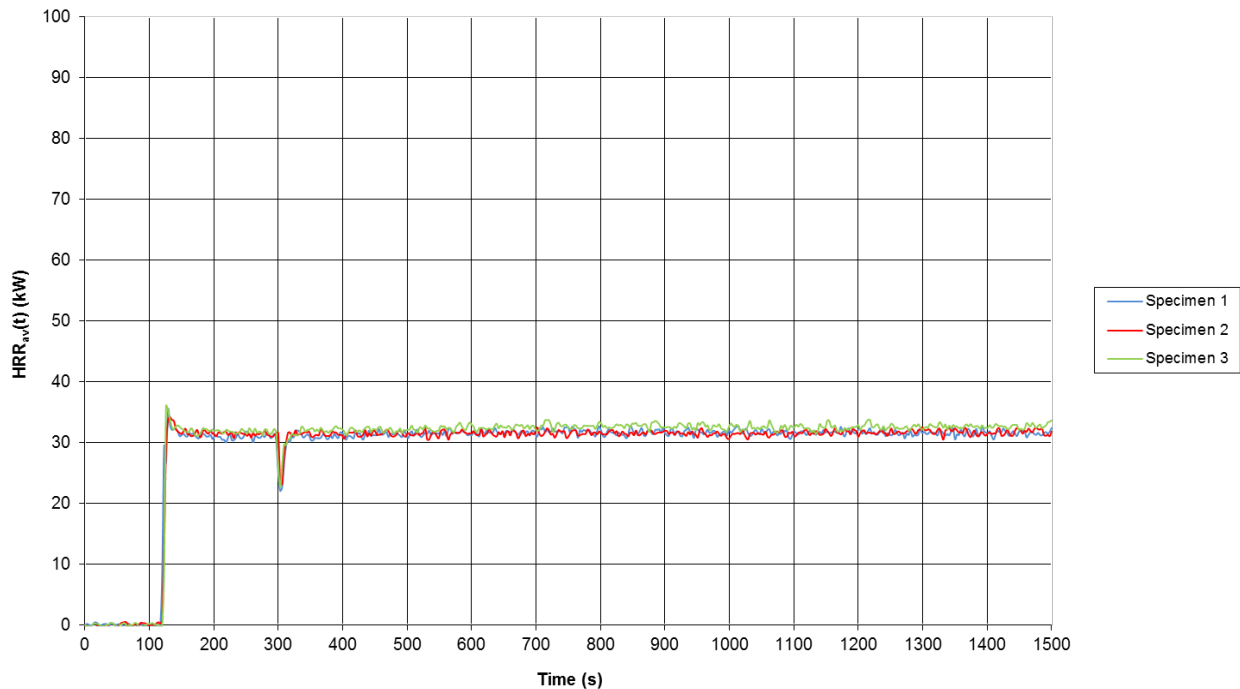


Figure 2. $THR(t)$ (MJ)

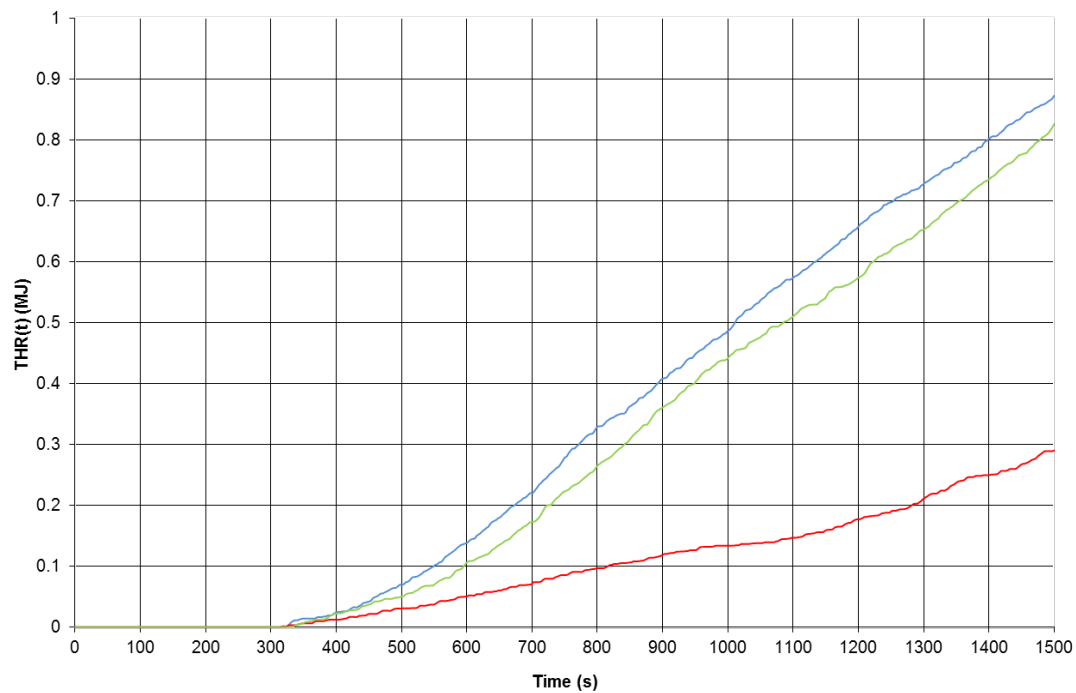


Figure 3. FIGRA

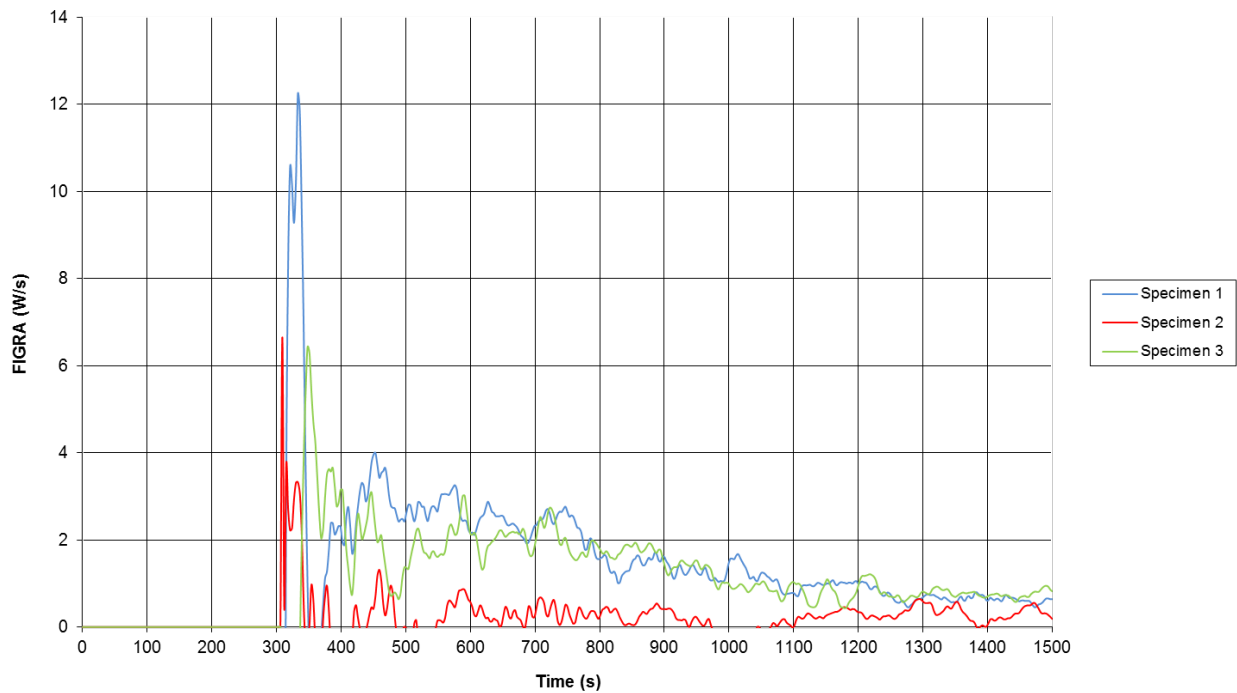
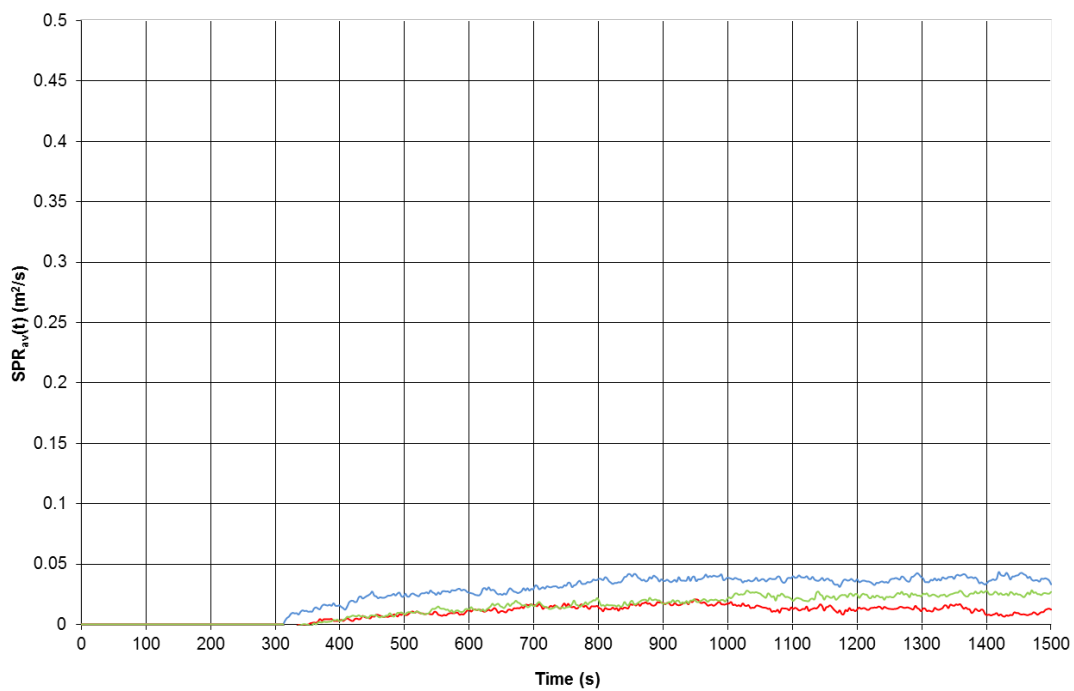
Figure 4. $SPR_{av}(t)$ (m^2/s)

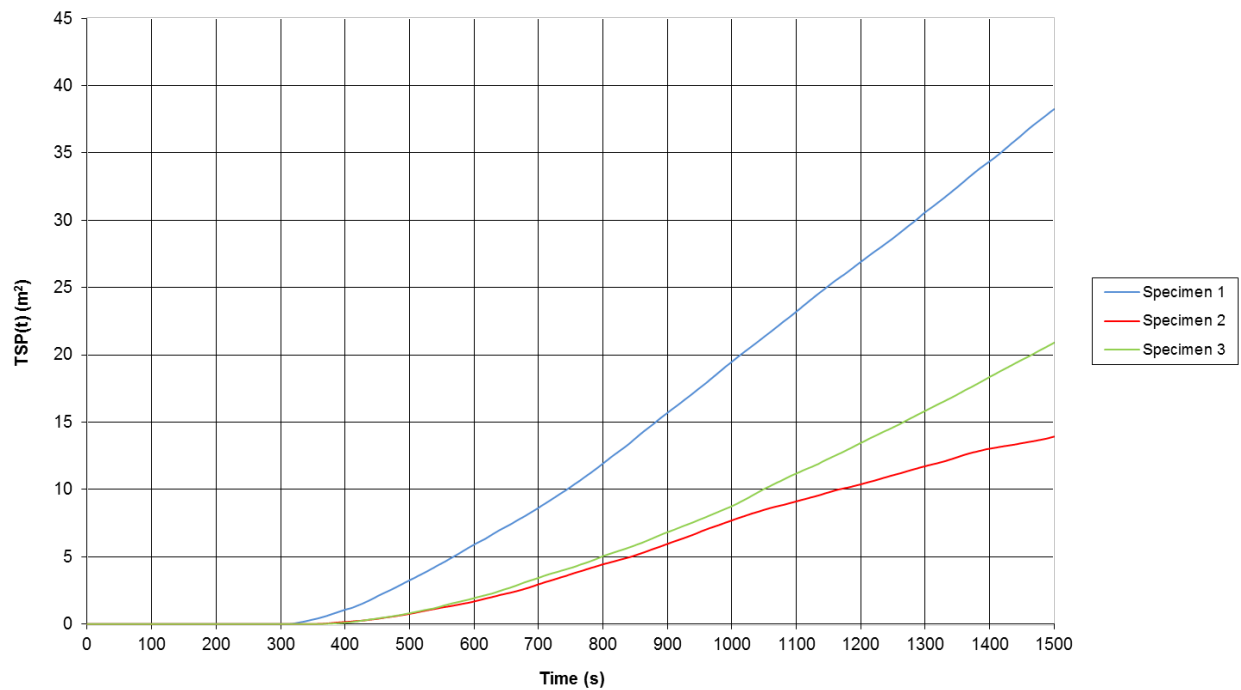
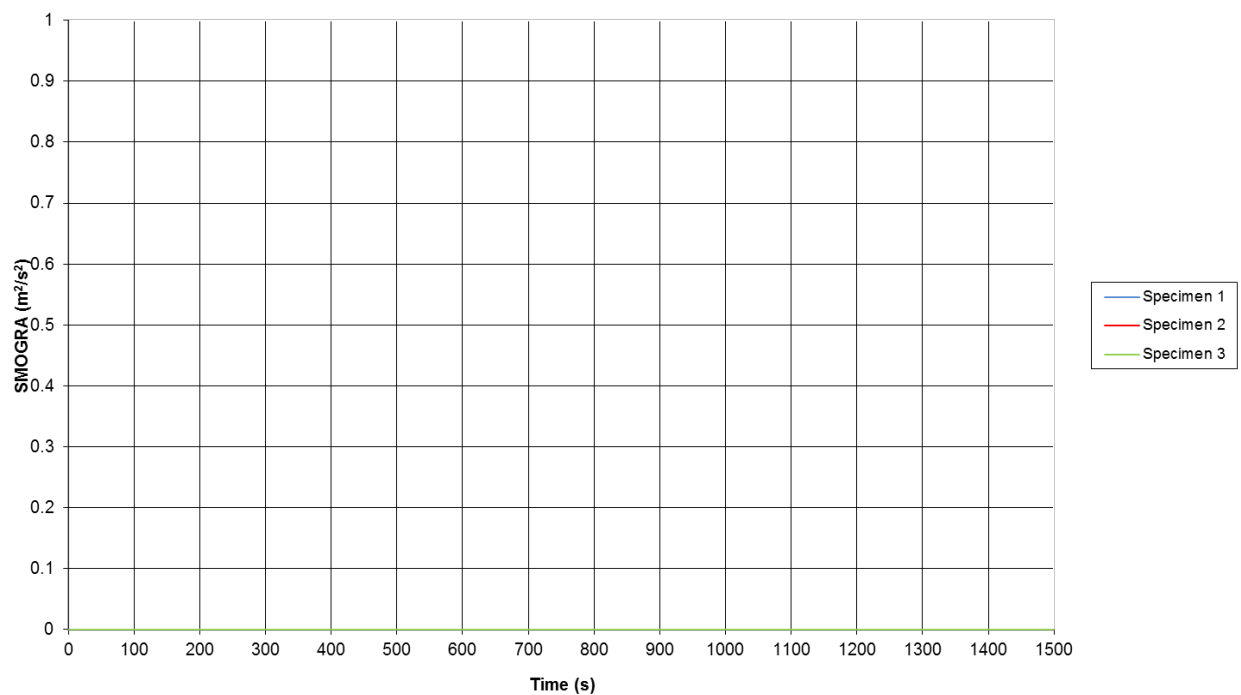
Figure 5. TSP(t) (m²)

Figure 6. SMOGRA Graph.



Revision History

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