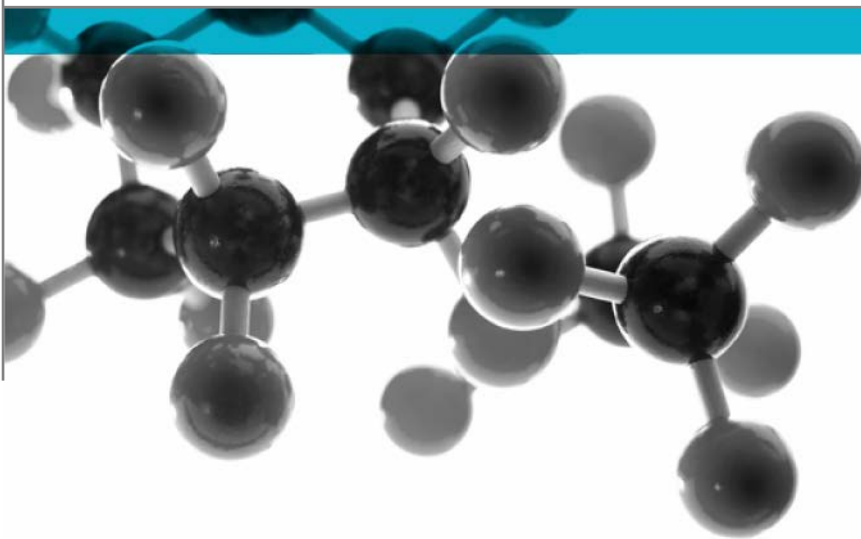


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# BS EN 13823:2010+A1:2014



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

A Report To: Eco-Sol Ltd

Document Reference: 379996

Date: 15<sup>th</sup> March 2017

Issue No.: 2

Page 1

Testing  
Advising  
Assuring



## Executive Summary

**Objective** To determine the fire performance of the following product when tested in accordance with BS EN 13823:2010+A1:2014.

Generic Description	Product reference	Thickness	Weight per unit area or density
Siberian larch timber coated on both front and reverse faces with a flame retardant grade coating	"Flametect C-WD+"	16mm	13.19kg/m <sup>2</sup>
<b>Individual components used to manufacture composite:</b>			
Flame retardant (coating)	"Flametect C-WD+"	Not stated	250ml/m <sup>2</sup>
Substrate	"Larch shiplap"	15mm	Not stated
<b>Please see page 5 of this test report for the full description of the product tested</b>			

**Test Sponsor** Eco-Sol Ltd, Cardiff House, Cardiff Road, Barry, Vale of Glamorgan, CF63 2AW

**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)	6.60	Recalculated	Recalculated
<b>101.60</b>	<b>80.18</b>		<b>24.82</b>	<b>115.92</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:** 24<sup>th</sup> February 2017

**Reason for revision**

This document replaces Issue 1 (dated 13<sup>th</sup> March 2017) of the same number which has been withdrawn. The sponsor has requested that an amendment be made to the description table on page 5.

## Signatories

	
Responsible Officer K. Hughes * Technical Officer	Authorised S. Deeming* Business Unit Head

\* For and on behalf of **Exova Warringtonfire**.

Report Issued: 15<sup>th</sup> March 2017

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## Test Details

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<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 13501-1:2007+A1:2009. The test was performed in accordance with the procedure specified in BS EN 13823:2010+A1:2014 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 13823:2010+A1:2014.
<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 24 <sup>th</sup> February 2017 at the request of Eco-Sol Ltd, the sponsor of the test.
<b>Provision of test specimens</b>	The specimens were supplied by the sponsor of the test. A representative of <b>Exova Warringtonfire</b> selected the samples for test and witnessed part of the application process during a factory audit, conducted on the 26 <sup>th</sup> January 2017.
<b>Conditioning of specimens</b>	The specimens were received on the 13 <sup>th</sup> February 2017 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>	Timber cladding/panelling.
<b>Test facility</b>	The Single Burning Item (SBI) test facility at <b>Exova Warringtonfire</b> is constructed in accordance with the specifications detailed in BS EN 13823:2010+A1:2014.
<b>Deviations from the test standard</b>	None.
<b>Exposed face</b>	The decorative 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 specimens given below has been prepared from information provided by the sponsor of the test. 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		Siberian larch timber coated on both front and reverse faces with a flame retardant grade coating
Product reference		"Flametect C-WD+"
Weight per unit area		13.19kg/m <sup>2</sup> (determined by <b>Exova Warringtonfire</b> )
Thickness		16mm (determined by <b>Exova Warringtonfire</b> )
Flame retardant (coating)	Generic type	A polymeric blend of organo-phosphate & nitrogen salts'
	Product reference	"Flametect C-WD+"
	Batch number	"IF06450"
	Name of manufacturer	Eco-Sol Ltd
	Colour	"Clear"
	Number of coats	One
	Application rate	250ml/m <sup>2</sup>
	Application method	Spray, brush or roller
	Specific gravity	1.42
	Curing process per coat	Air dry
Substrate	Product reference	"Larch shiplap"
	Generic type	Wood
	Name of supplier	Robert Price Ltd
	Thickness	15mm
	Density	The sponsor of the test was unable to provide this information
Mounting and fixing details		A 40mm ventilated cavity was situated between the reverse face of the specimens and the calcium silicate backing board
Brief description of manufacturing process		The sponsor of the test was unwilling to provide this information

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> )	112.49	87.19	105.12	101.60
FIGRA (W/S) ( <i>THR(t) threshold of 0.4MJ</i> )	94.20	66.15	95.48	80.18
THR 600s (MJ)	7.06	6.00	6.73	6.60
SMOGRA (m <sup>2</sup> /s <sup>2</sup> ) (Recalculated results)	23.98	23.14	27.33	24.82
TSP 600s (m <sup>2</sup> ) (Recalculated results)	114.85	118.31	114.61	115.92
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 13501-1:2007+A1:2009.

**Table 2**

Time		<b>Observations during test of Specimen 1</b>
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
05	21	Flaming on the surface of the product occurred in the region of the burner
12	00	The flames penetrated the specimen in the region of the burner
26	00	End of test conditions. Flaming continued to the end of the test

Time		<b>Observations during test of Specimen 2</b>
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
06	18	Flaming on the surface of the product occurred in the region of the burner
12	00	The flames penetrated the specimen in the region of the burner
26	00	End of test conditions. Flaming continued to the end of the test

Time		<b>Observations during test of Specimen 3</b>
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
05	21	Flaming on the surface of the product occurred in the region of the burner
12	00	The flames penetrated the specimen in the region of the burner
26	00	End of test conditions. Flaming continued to the end of the test

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)

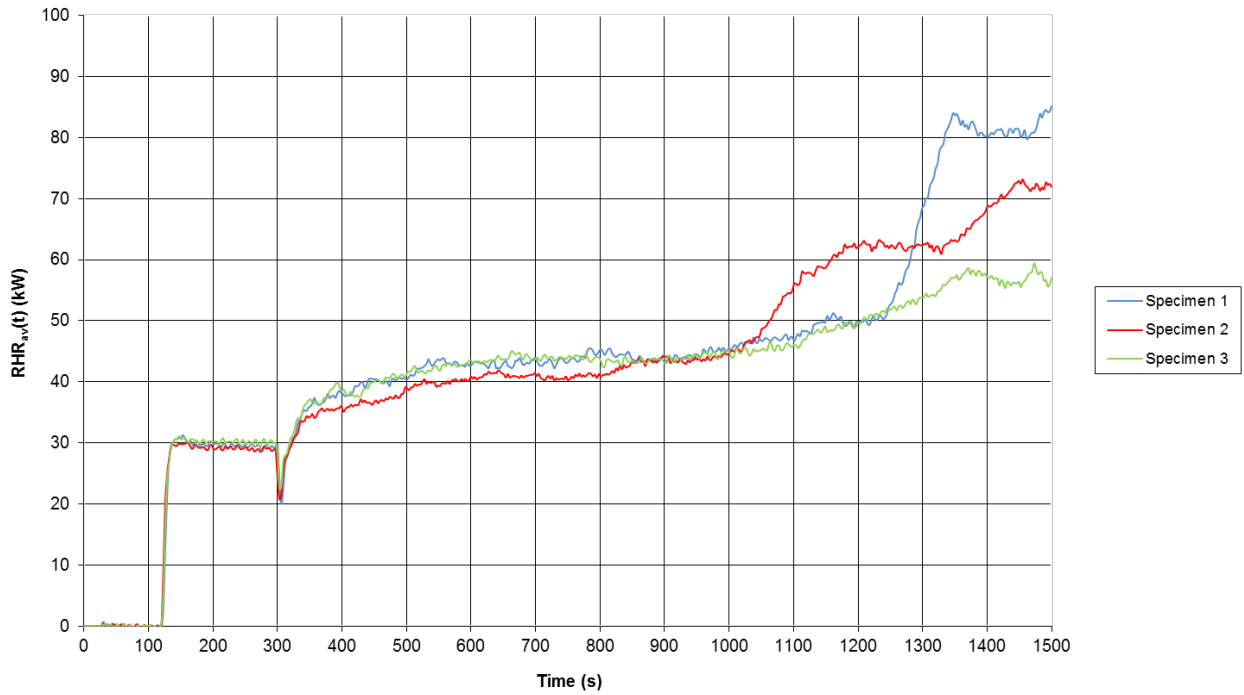


Figure 2.  $THR(t)$  (MJ)

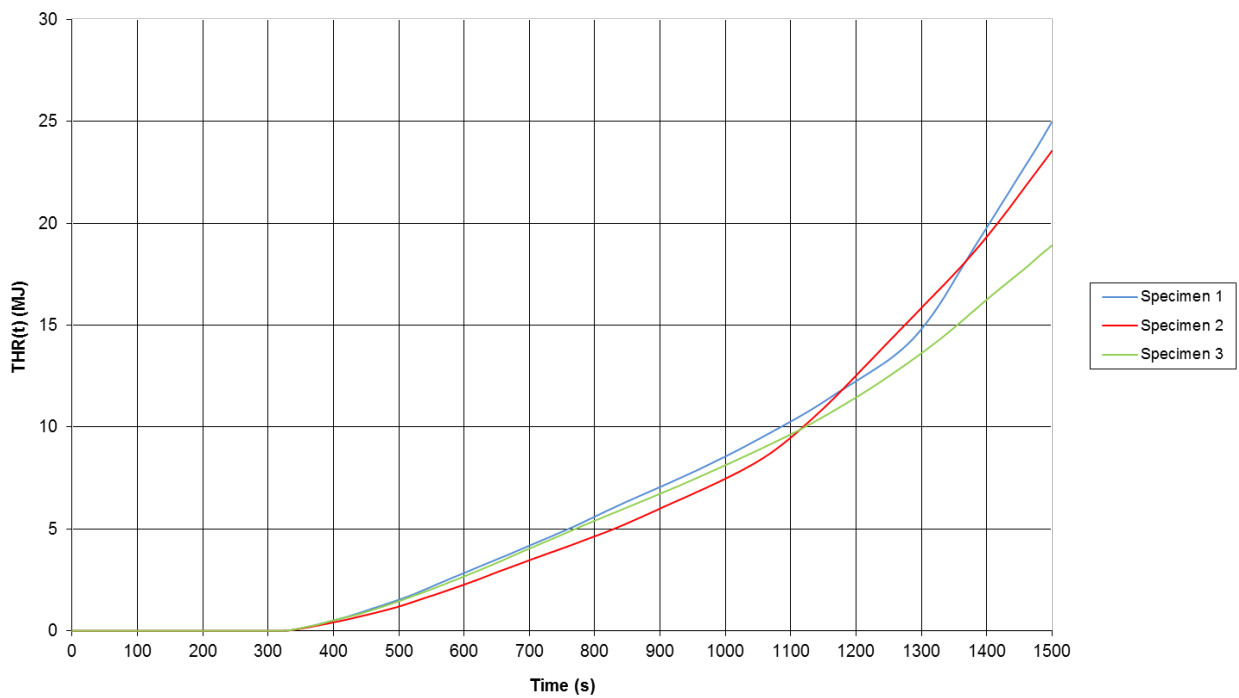


Figure 3. FIGRA

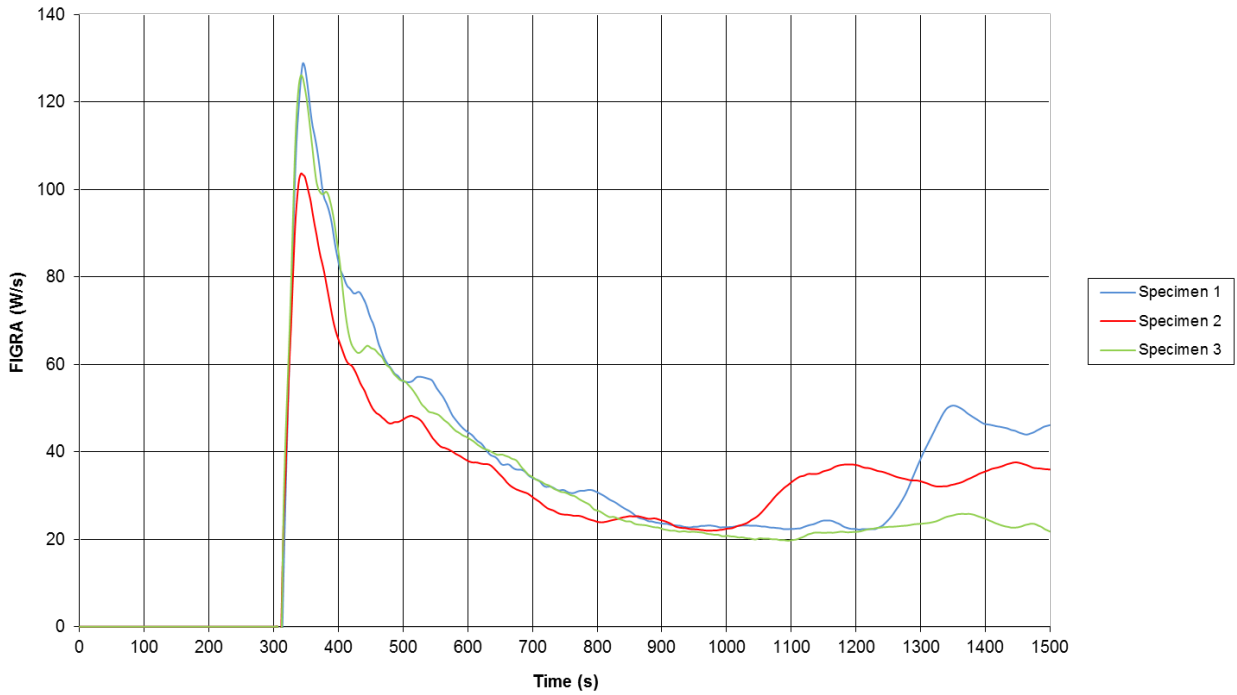


Figure 4.  $SPR_{av}(t)$  ( $m^2/s$ )

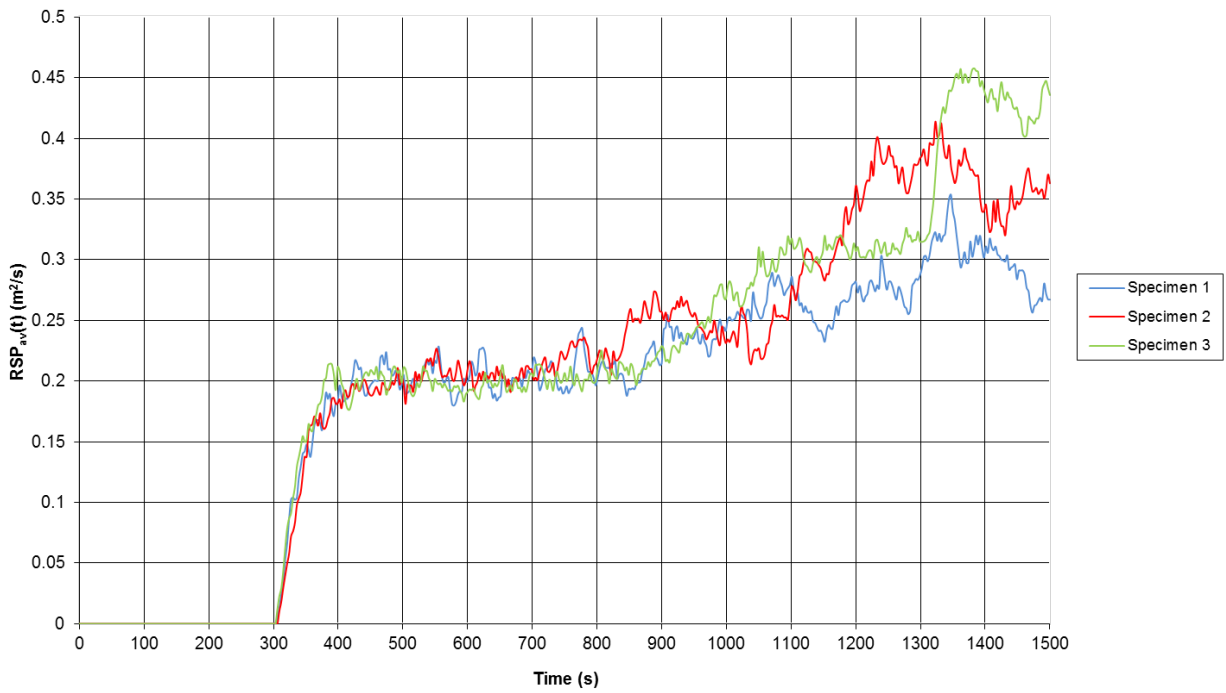


Figure 5. TSP(t) (m<sup>2</sup>)

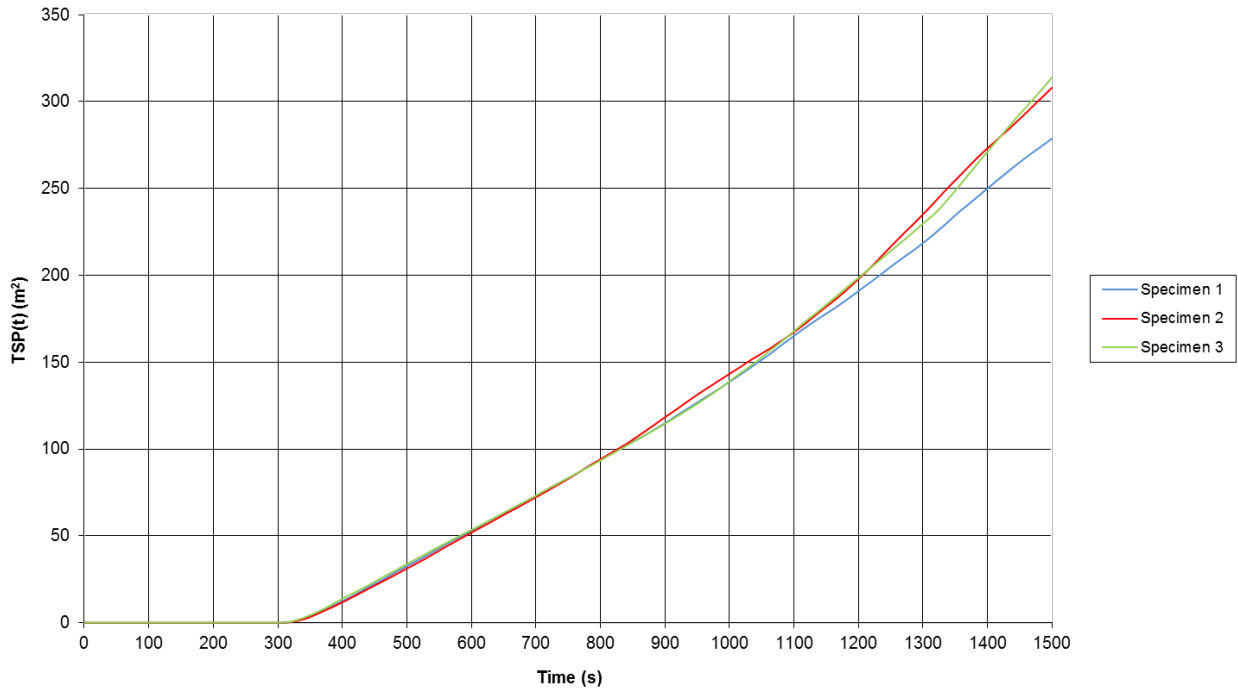
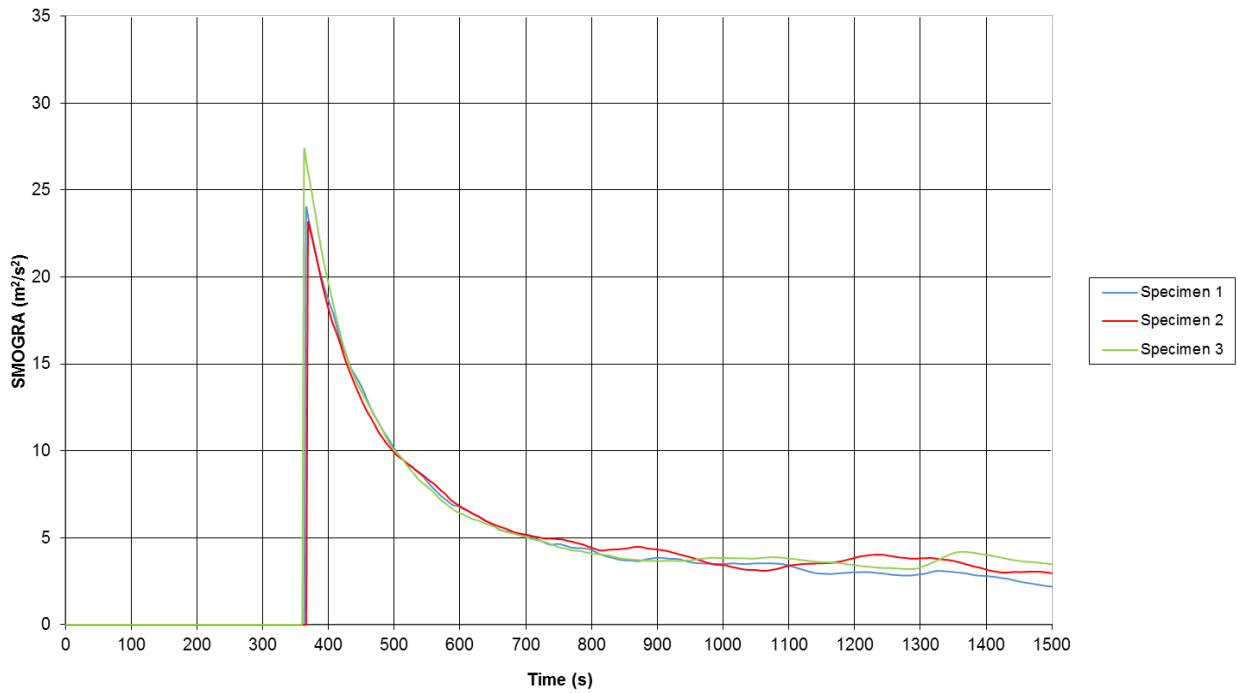


Figure 6. SMOGRA Graph.



## Revision History

Issue No : 2	Re-issue Date: 15 <sup>th</sup> March 2017
Revised By: K Hughes	Authorised By: S Deeming
Reason for Revision: This document replaces Issue 1 (dated 13 <sup>th</sup> March 2017) of the same number which has been withdrawn. The sponsor has requested that an amendment be made to the description table on page 5.	

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