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REPORT

Reaction to fire testing of ES/VFR/W with Premier white top coat applied to plywood, thickness 9 mm
Single Burning Item test according to EN 13823:2014

Report no.	2019-Efectis-R001205
Sponsor	Intumescent Systems Ltd Envirograf House Barfrestone CT15 7JG DOVER UNITED KINGDOM
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1. PRODUCT IDENTIFICATION

ES/VFR/W with Premier white top coat applied to plywood, thickness 9 mm, further referred to as 'the product'.

2. ABSTRACT

Determination of the reaction to fire properties of the product, when exposed to the thermal attack by a **Single Burning Item** according to EN 13823:2010+A1:2014, with the objective to obtain the reaction to fire classification according to EN 13501-1:2018.
This test series is an additional series in the CE-marking process initiated by the certification company The Catalonia Institute of Construction Technology (ITeC) in Barcelona.
The purpose is a verification of the results of the same coating system with 5 coating layers instead of 3 layers as described in report 2018-Efectis-R002183.

3. DETAILS OF THE PRODUCT TESTED

3.1 INTENDED APPLICATION

The product will be used as a ceiling- wall- and façade finish.

3.2 MANUFACTURER/IMPORTER

Intumescent Systems Ltd
Envirograf House
Barfrestone
CT15 7JG DOVER
UNITED KINGDOM

3.3 PRODUCT DESCRIPTION

According to the sponsor the product is from inside out composed of:

- Coat 1 – layer of ES/VFR clear primer 12m^2;
- Coat 2 – layer of ES/VFR/W 10m^2;
- Coat 3 – layer of ES/VFR/W 10m^2;
- Coat 4 – layer of premier white top coat 8m^2;
- Coat 5 – layer of premier white top coat 8m^2.

Applied to plywood thickness 9 mm.

The product has a total thickness of 9 mm and a mass per unit area of approx. 4.4 kg/m^2.

4. DETAILS OF THE EXAMINATION

4.1 SAMPLES

Sampling procedure	The specimens were prepared and submitted by the sponsor. The preparation is described in report 2019-Efectis-R001227.
Age	At the time of receipt: no information received.
Date of receipt	June 12, 2019

4.2 SPECIMENS

Substrate used	Plywood, not fire retardant treated (E N636), 450±50 kg/m^3, thickness 9±1mm (class D-s2,d0) according to EN 13238:2010.
Method of applying	Painting
Specimen preparation	The long specimen wing was provided with a vertical joint at a distance of 200 mm from the inner corner and a horizontal joint at a distance of 500 mm from the bottom. See photographs of the SBI test at the end of the report.

4.3 CONDITIONING

Prior to the examinations, the specimens were conditioned over a period of 2 weeks minimum at a temperature of (23 ± 2) ºC and a relative humidity of (50 ± 5) % according to § 4.1 of EN 13238.

4.4 EXAMINATION

Method of mounting and fixing	The panels were positioned with a non-ventilated air gap of 32 mm to the backing board.
Deviations from the test method	None
Guideline for European Technical Approval of Fire retardant products	ETAG 028:2012
Number of tests	Due to the verification purpose only one Single Burning Item test was carried out, in accordance with EN 13823.
Date of examination:	June 26, 2019

Table 1: Single Burning Item classification parameter results

Test parameter / Test number		1
$FIGRA_{0.2\ MJ}$	[W/s]	13
$FIGRA_{0.4\ MJ}$	[W/s]	13
THR_{600s}	[MJ]	1.1
LFS	{Yes, No}	No
SMOGRA	[m^2/s^2]	1.3
TSP_{600s}	[m^2]	42
Flaming droplets/particles		
Flaming ≤ 10 s	{Yes, No}	No
Flaming > 10 s	{Yes, No}	No

Legends:

FIGRA	Fire growth rate: The maximum of the quotient of heat release rate from the burning specimen and the time of its occurrence, determined during the full test period, using a THR-threshold of 0.2 MJ or 0.4 MJ and a HRR_{av}-threshold of 3 kW.
THR_{600s}	Total heat release from the burning specimen during the first 600s of exposure to the main burner flames.
LFS	Lateral flame spread over the long specimen wing.
SMOGRA	Smoke growth rate: The maximum of the quotient of smoke production rate from the burning specimen and the time of its occurrence (multiplied by 10.000), determined during the full test period, using the TSP-threshold of 6 m^2 and the SPR_{av}-threshold of 0.1 m^2/s.
TSP_{600s}	Total smoke production from the burning specimen during the first 600s of exposure to the main burner flames.

Observations of physical behaviour of the test specimen: None

5. CONCLUSIONS

A formal classification is to be assessed in accordance with EN 13501-1, “Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests”.
This classification will be a combination of the previous test results described in test report 2018-Efectis-R002183 and the results of this verification series. The verification of the test results is described in report 2019-Efectis-R001219.

Graphs of Rate of Heat Release ($HRR_{av}(t)$), Rate of Smoke Production ($SPR_{av}(t)$), Total Heat release (THR(t)), Total Smoke Production (TSP(t)), $FIGRA_{0.2\ MJ}$, $FIGRA_{0.4\ MJ}$ and SMOGRA, are presented hereafter followed by some photographs of the test setup and test results.

Remarks:
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.

Regarding the estimated precision of the test method, the following information is given in Annex B of EN 13823.

Table B.2 — Average relative standard deviations

	$FIGRA_{0.2\ MJ}$	$FIGRA_{0.4\ MJ}$	$THR_{600\ s}$	SMOGRA	$TSP_{600\ s}$
Average (s_r /m)	14 %	15 %	11 %	15 %	18 %
Average (s_R /m)	23 %	25 %	21 %	40 %	44 %

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APPENDIX: CHARTS

Chart 1	Rate of Heat Release ($HRR_{av}(t)$) [kW]
Chart 2	Rate of Smoke Production ($SPR_{av}(t)$) [m^2/s]
Chart 3	Total Heat release (THR(t)) [MJ]
Chart 4	Total Smoke Production (TSP(t)) [m^2]
Chart 5	$FIGRA_{0.2\ MJ}$ [W/s]
Chart 6	$FIGRA_{0.4\ MJ}$ [W/s]
Chart 7	SMOGRA [m^2/s^2]

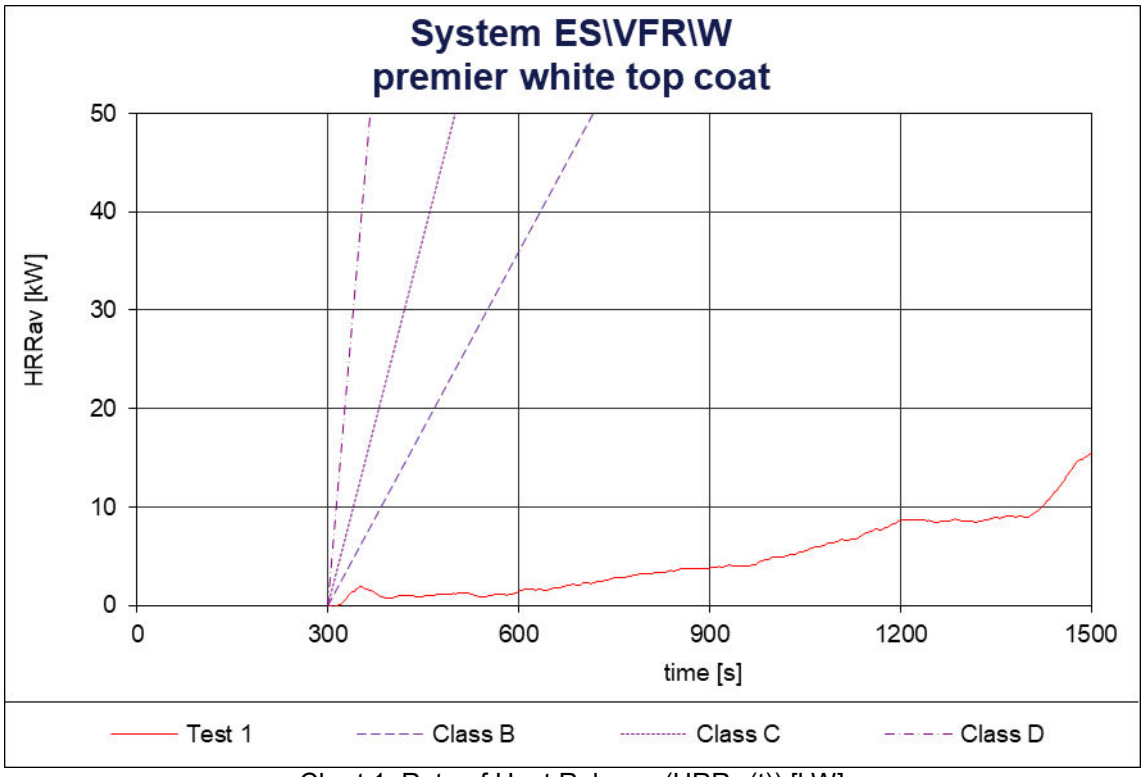

Chart 1: Rate of Heat Release ($HRR_{av}(t)$) [kW]

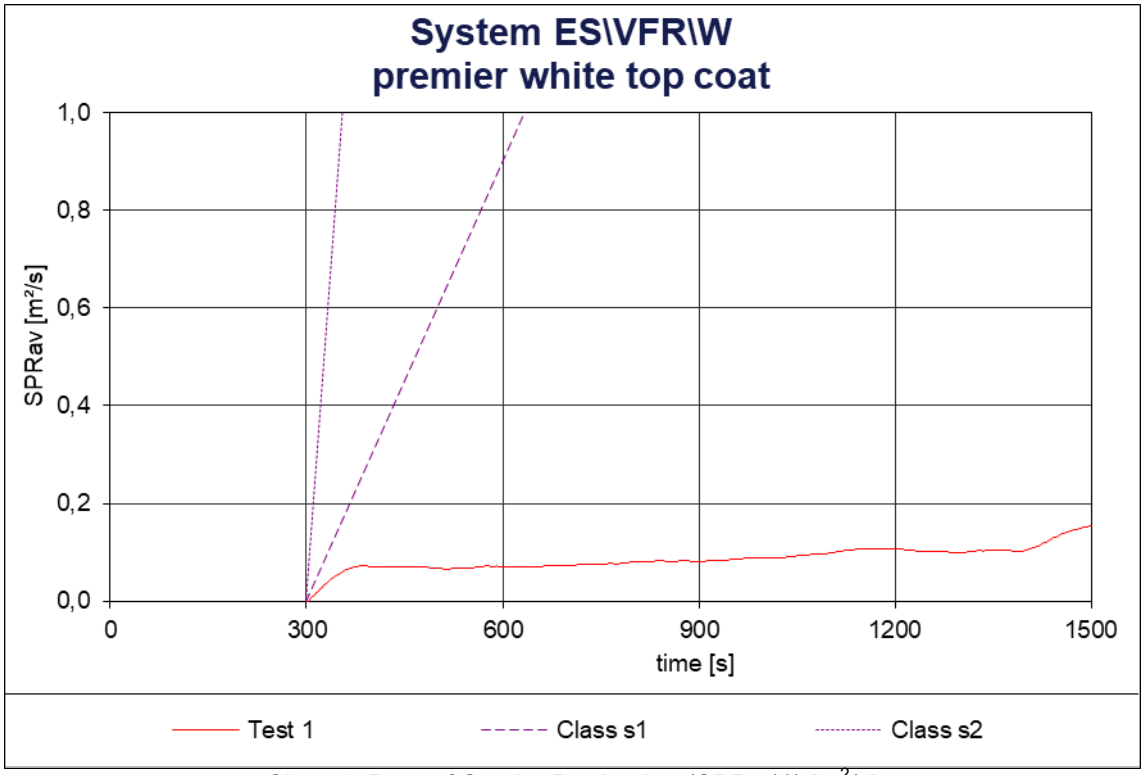

Chart 2: Rate of Smoke Production ($SPR_{av}(t)$) [m^2/s]

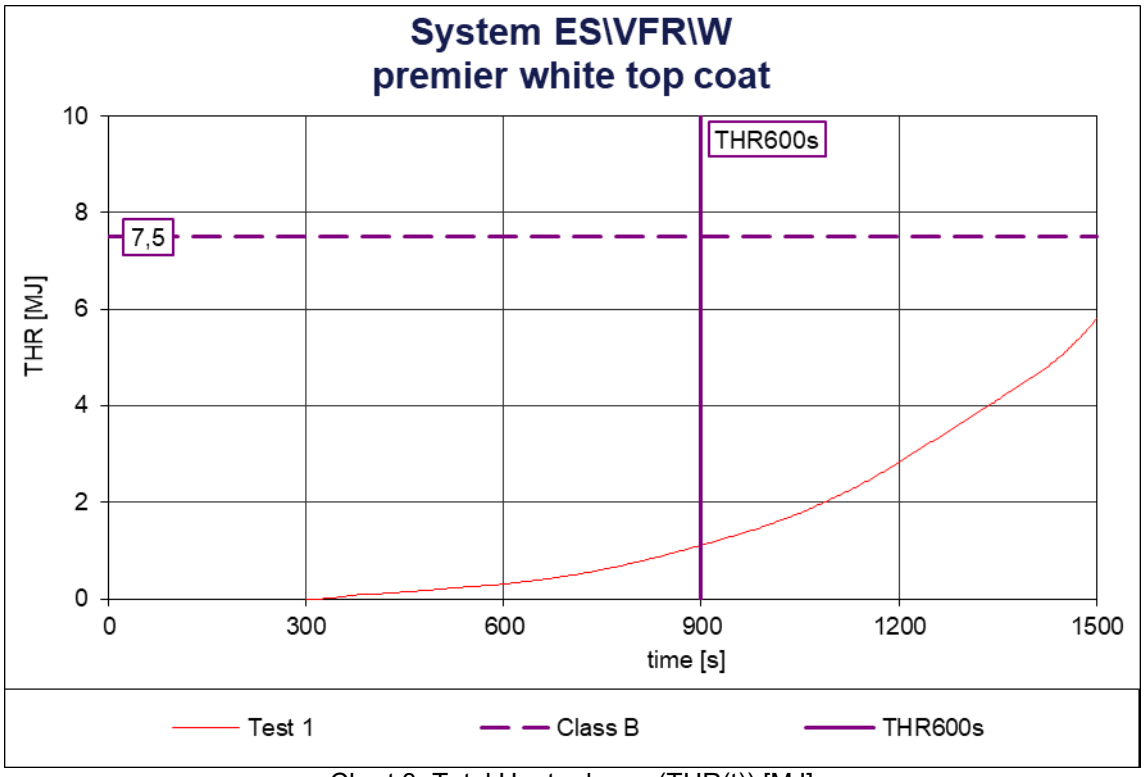

Chart 3: Total Heat release (THR(t)) [MJ]

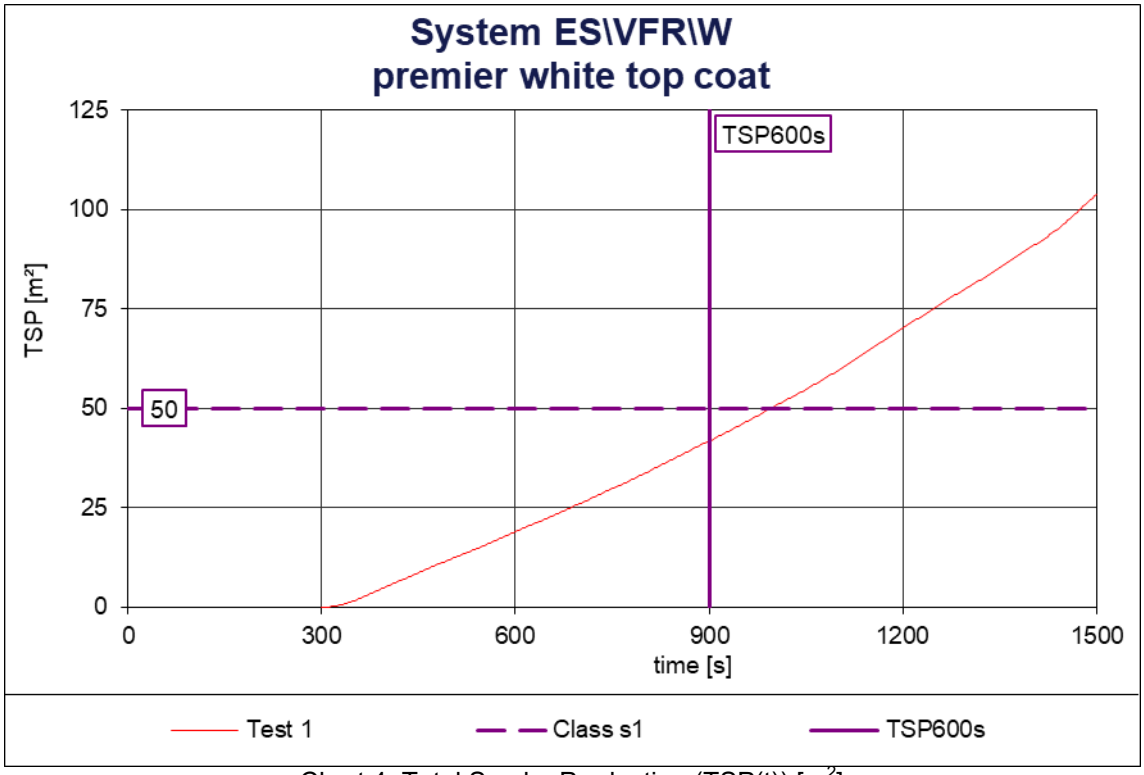

Chart 4: Total Smoke Production (TSP(t)) [m^2]

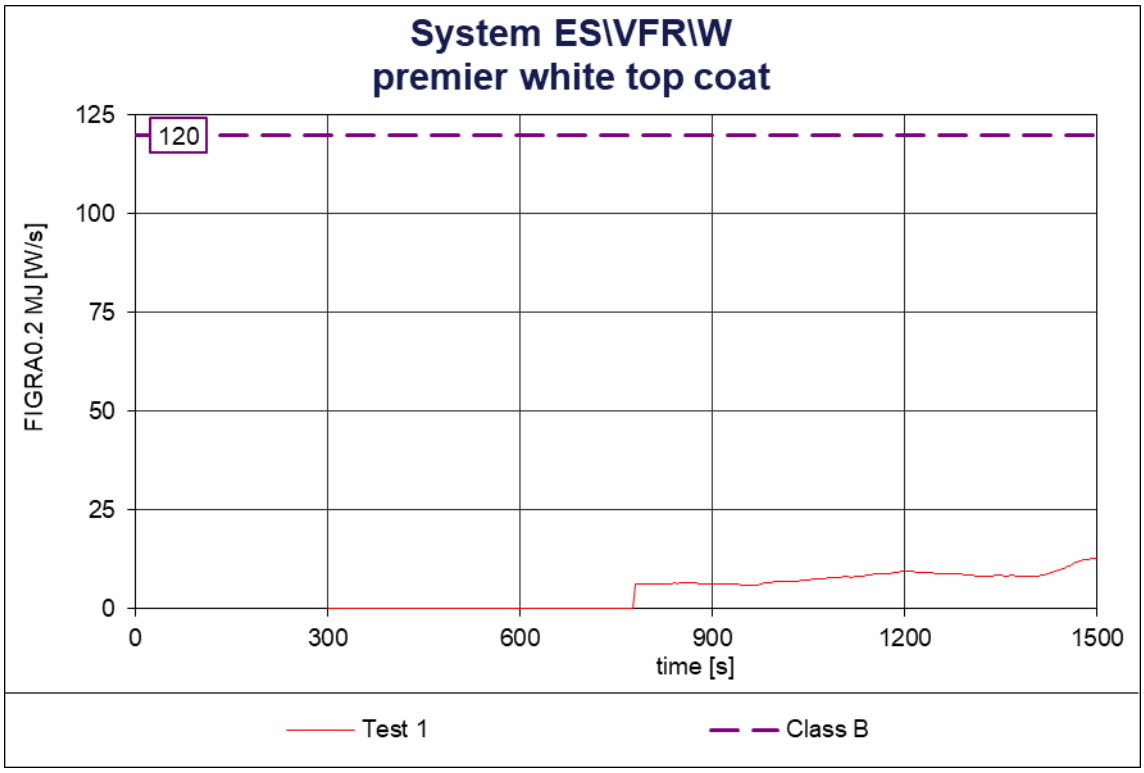

Chart 5: $FIGRA_{0.2\ MJ}$ [W/s]

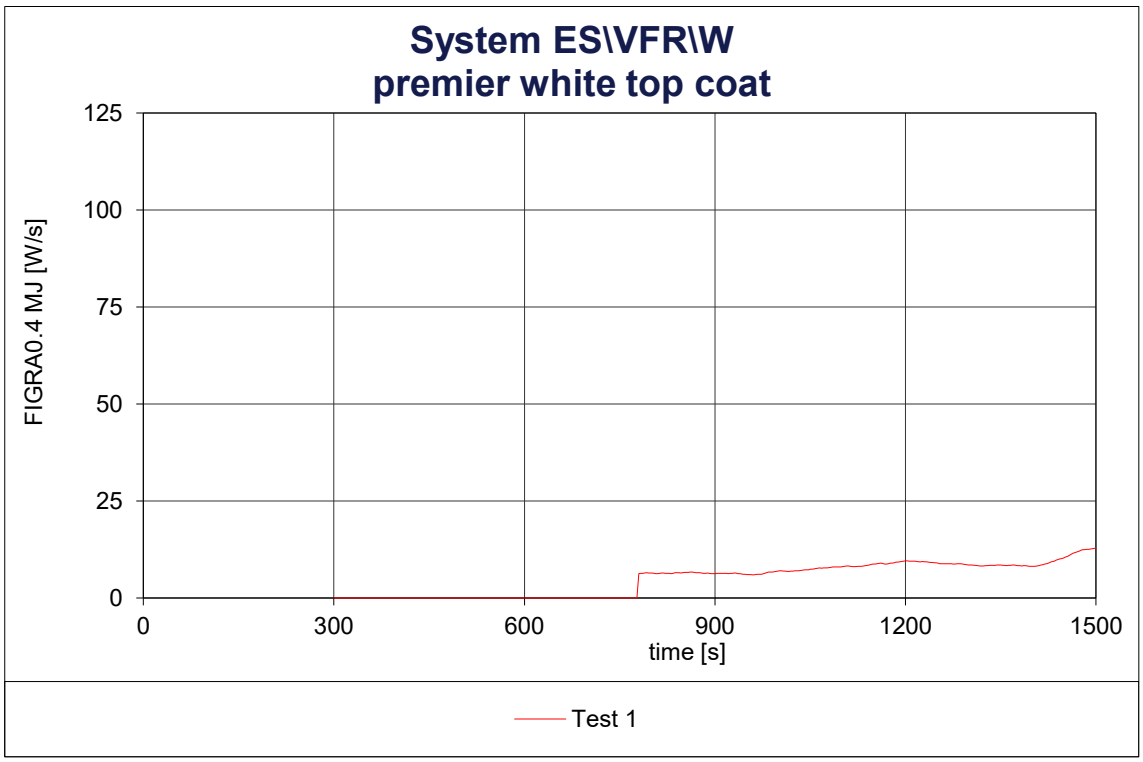

Chart 6: $FIGRA_{0.4\ MJ}$ [W/s]

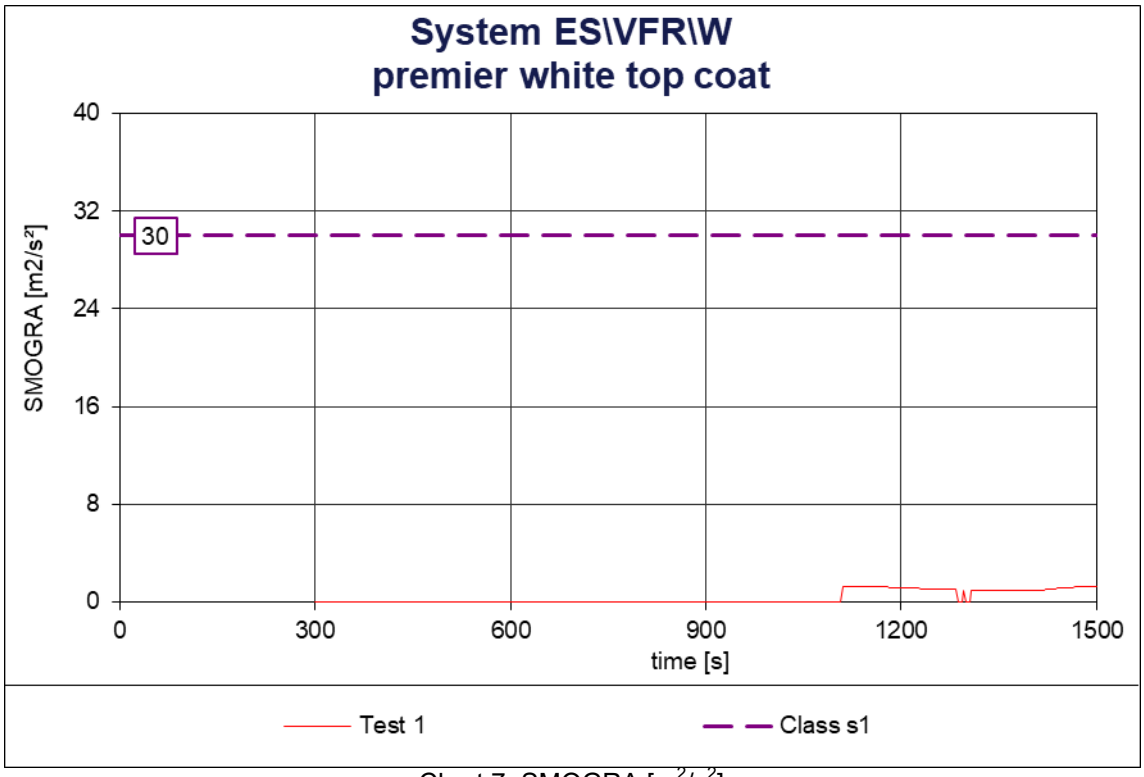

Chart 7: SMOGRA [m^2/s^2]

APPENDIX: PHOTOGRAPHS

Photographs 1 and 2: Specimen prior to testing

Photographs 3 and 4: Specimen after testing