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REPORT

Reaction to fire testing of Spruce wood with a white primer Single Burning Item test according to EN 13823:2020

Report no.	2022-Efectis-R000769
Sponsor	Nederlandse Brancheverenigingen voor de Timmerindustrie Westeinde 10 1334 BK ALMERE THE NETHERLANDS
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1. PRODUCT IDENTIFICATION

Spruce wood with a white primer, 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 13823:2020 with the objective to obtain the reaction to fire classification according to EN 13501-1:2018.

3. DETAILS OF THE PRODUCT TESTED

3.1 INTENDED APPLICATION

The product will be used as the vertical parts (risers) of a staircase construction.

3.2 MANUFACTURER/IMPORTER

Nederlandse Branchevereniging voor de Timmerindustrie
Westeinde 10
1334 BK ALMERE
THE NETHERLANDS

3.3 PRODUCT DESCRIPTION

According to the sponsor the product is composed of spruce wood (Picea abies).
The tested panels are:

- 37.6 ± 0.4 mm and have a density from 400 kg/m³ to 500 kg/m³;
- Not impregnated;
- Coated with a white primer of reference with Ankocryl Basispaint for stairs S HB, usage 60 µm to 90 µm.

4. DETAILS OF THE EXAMINATION

4.1 SAMPLES

Sampling procedure	The specimens were prepared and submitted by the sponsor.
Age	At the time of receipt: no information received.
Date of receipt	March 23rd 2022

4.2 SPECIMENS

Substrate used	Not applicable
Specimen preparation	The long specimen wing was not 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 a month 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 ventilated air gap.
Exposed surface	The frontside of the product was exposed by flames during testing.
Deviations from the test method	None
Number of tests	A total of three Single Burning Item tests were carried out, all in accordance with EN 13823.
Date of examination:	May 4th 2022
Location of examination	Efectis Nederland BV, Bleiswijk, The Netherlands

The results are given in Table 1.

Table 1: Single Burning Item classification parameter results

Test parameter / Test number		1	2	3	**Classification parameter**
$FIGRA_{0.2\ MJ}$	[W/s]	646	516	532	**565**
$FIGRA_{0.4\ MJ}$	[W/s]	646	516	532	**565**
THR_{600s}	[MJ]	12.4	12.2	12.8	**12.5**
LFS	{Yes, No}	No	No	No	**No**
SMOGRA	[m^2/s^2]	2.7	2.0	2.2	**2.3**
TSP_{600s}	[m^2]	48	34	36	**39**
Flaming droplets/particles					
Flaming ≤ 10 s	{Yes, No}	No	No	No	**No**
Flaming > 10 s	{Yes, No}	No	No	No	**No**

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”.

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]

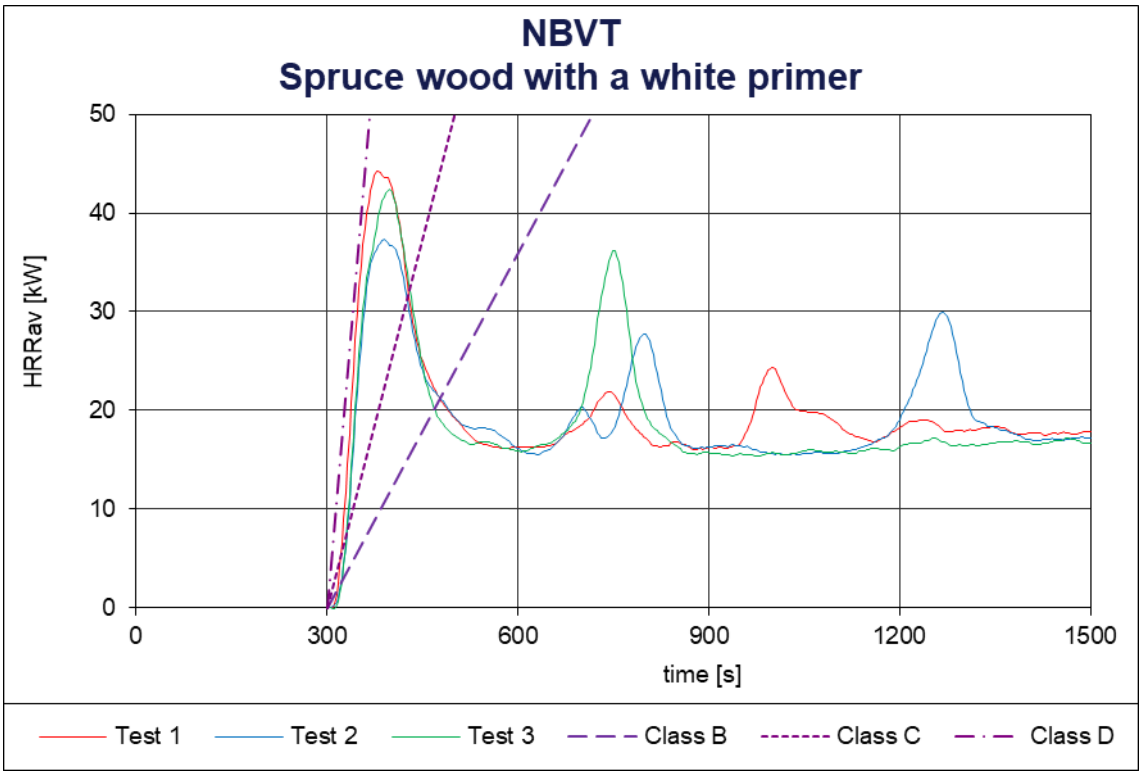

Chart 1: Rate of Heat Release ($HRR_{av}(t)$) [kW]

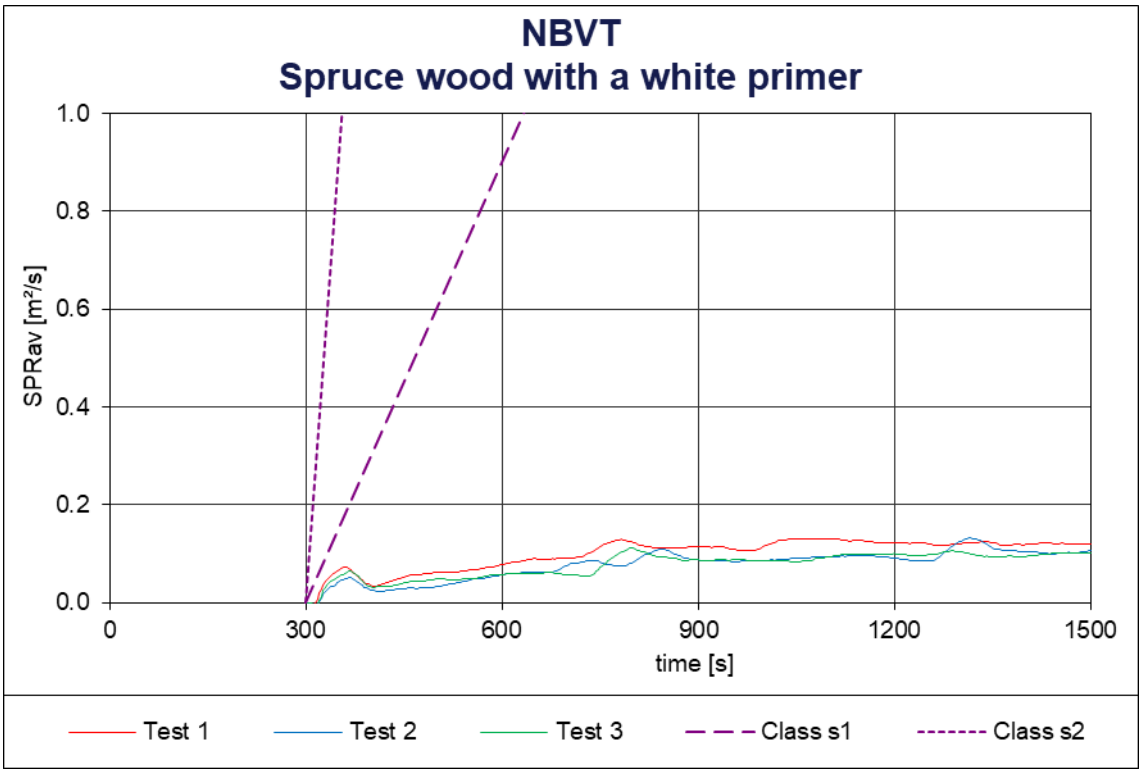

Chart 2: Rate of Smoke Production ($SPR_{av}(t)$) [m^2/s]

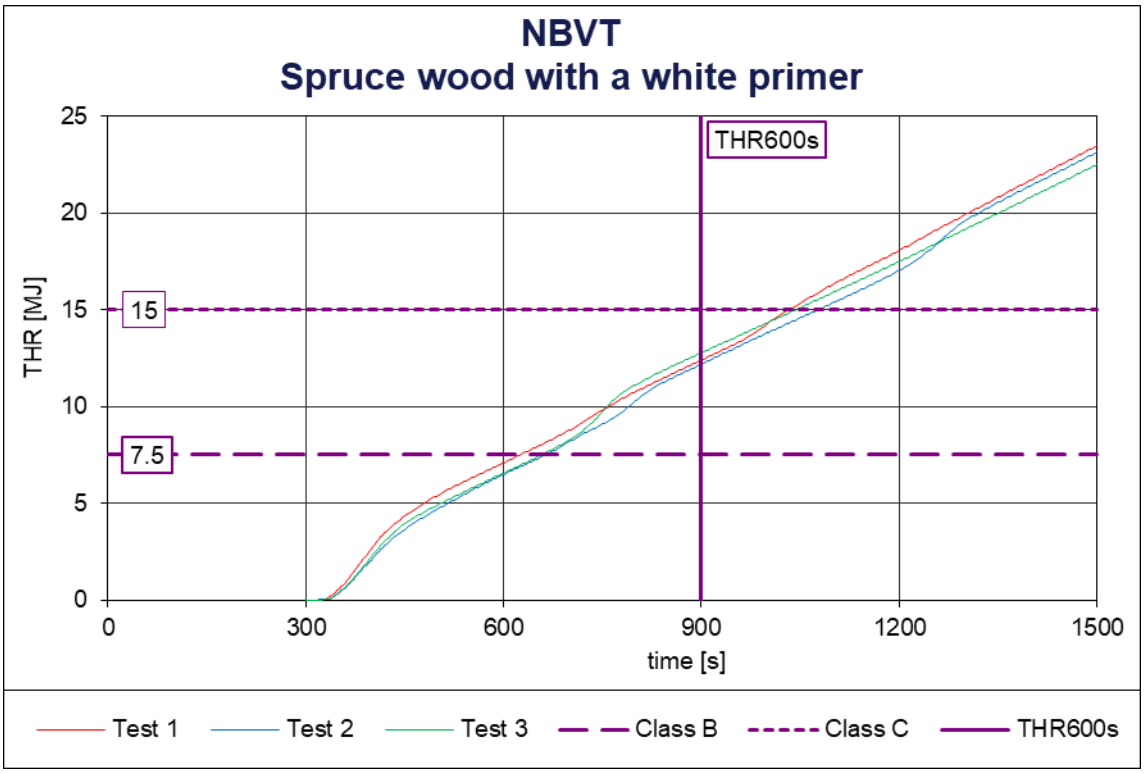

Chart 3: Total Heat release (THR(t)) [MJ]

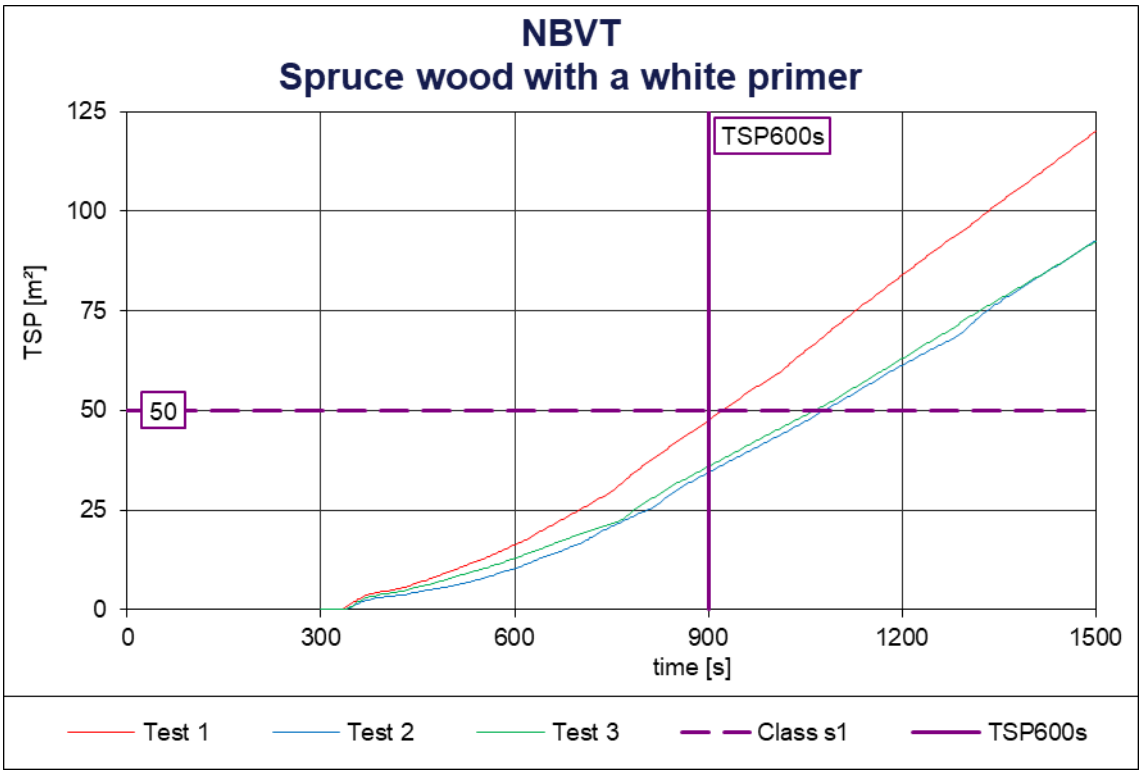

Chart 4: Total Smoke Production (TSP(t)) [m²]

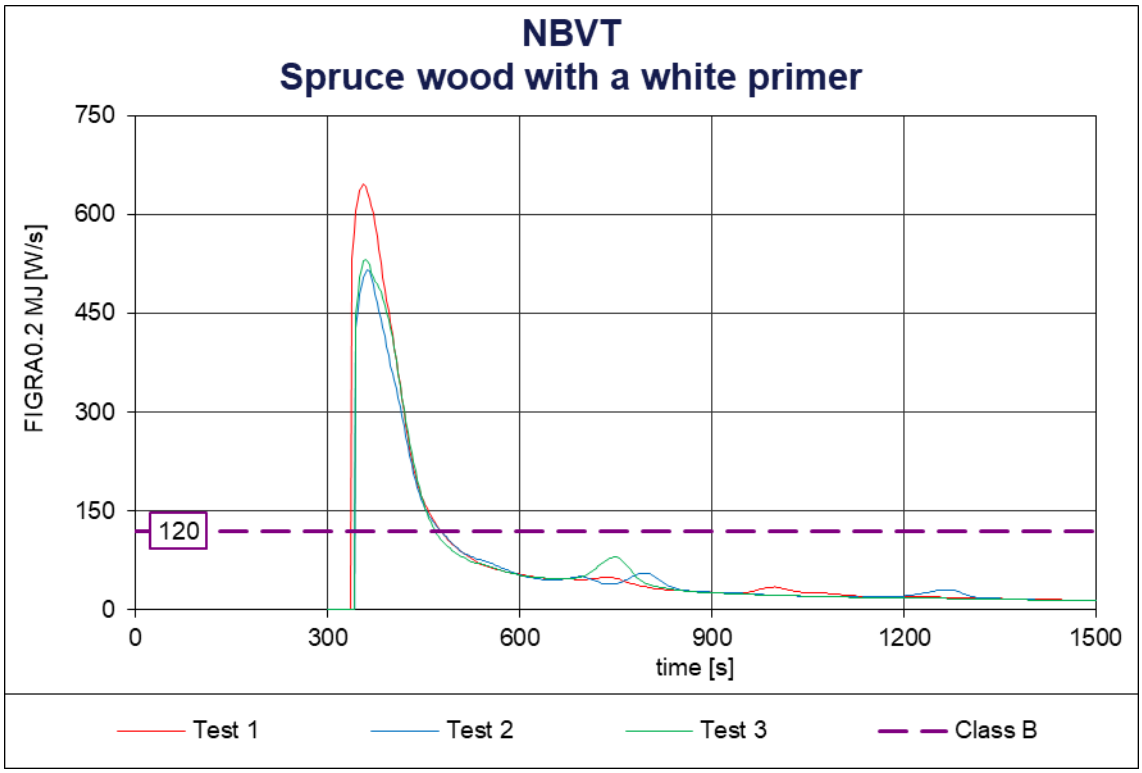

Chart 5: $FIGRA_{0.2\ MJ}$ [W/s]

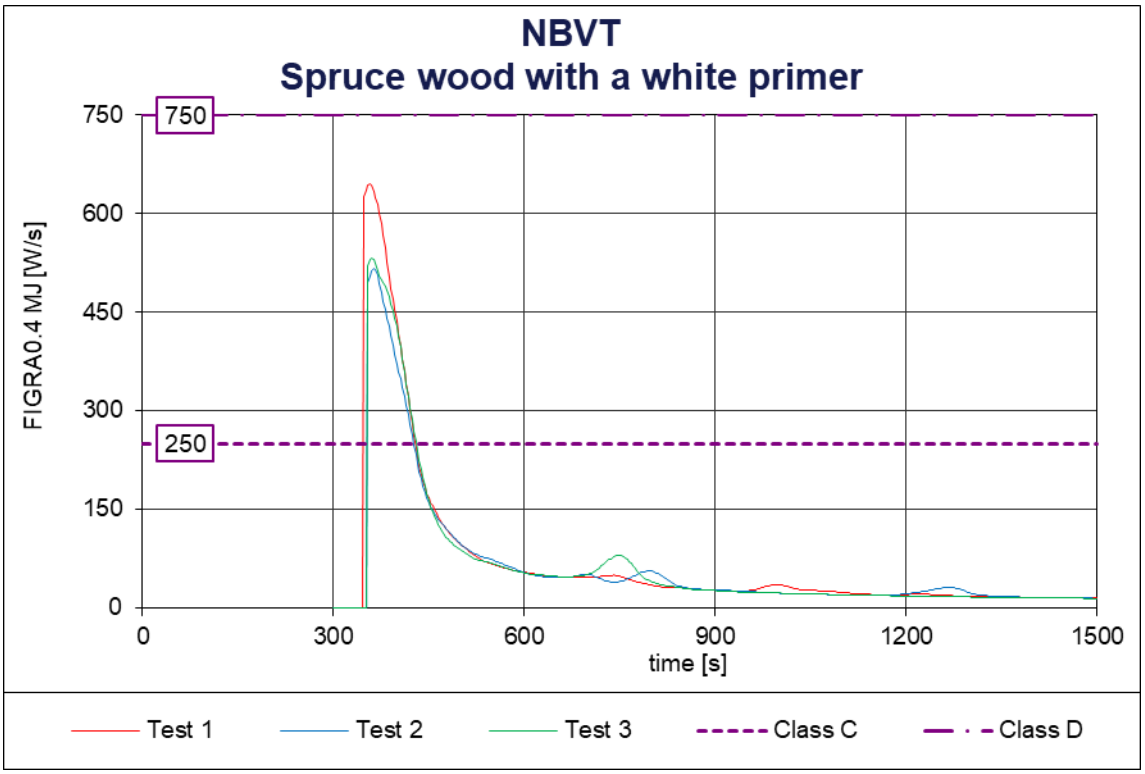

Chart 6: $FIGRA_{0.4\ MJ}$ [W/s]

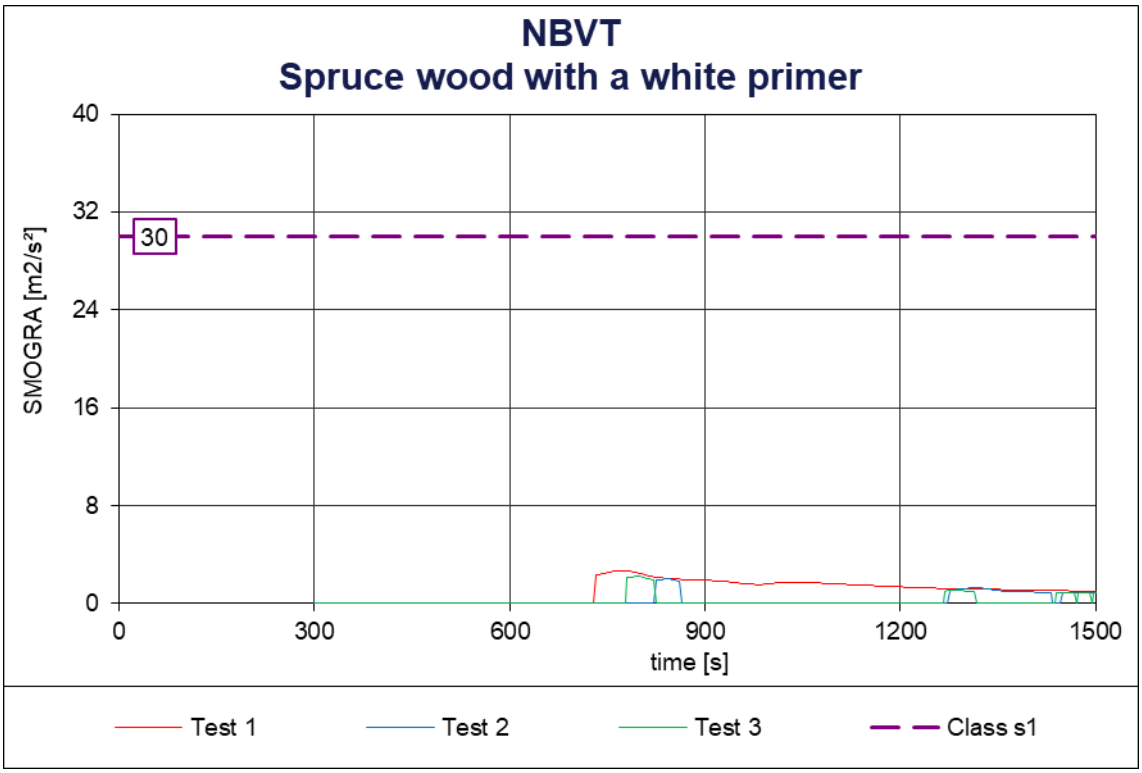

Chart 7: SMOGRA [m^2/s^2]

APPENDIX: PHOTOGRAPHS

Photographs 1 and 2: Specimen prior to testing

Photographs 3 and 4: Specimen after testing