REPORT
issued by an Accredited Testing Laboratory

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SWEDAC ACKREDITERING 1002 ISO/IEC 17025

Byggma ASA
Postboks 21
NO-4701 VENNESLA

Fire test according to EN 13823 (SBI Method) and EN ISO 11925-2

(4 appendices)

Introduction

SP has by request of Byggma ASA performed fire tests according to EN 13823:2010 (SBI method) and EN ISO 11925-2. The purpose of the test is as a basis for technical fire classification.

Product

The product is composed by wood fibre panels covered with fire retardant paint and two coats with Palett. The panels can be used both on the wall and in the ceiling, and the panel dimensions vary with their end use: wall panels with dimensions 620 mm x 2390 mm or 2740 mm and ceiling panels with dimensions 620 mm x 1220 mm.

Ceiling panels were used during the tests, as they will need the largest number of joints when preparing the specimens.

The following product information was received from the client:

Wood fibre panel with a nominal thickness of 10.7 + 0.4/-0.7 mm and a nominal density of 835 ± 40 kg/m^3. The wood fibre panels is painted with a fire retardant paint called "Brannitmaling" with a nominal area weight of 360 g/m^2. A top coat and protective lacquer of white acrylic paint is applied with a nominal area weight of 55 g/m^2.
The complete product has a nominal thickness of 11.0 ± 0.2 mm and a nominal density of 795 – 875 kg/m^3.

Manufacturer

Byggma ASA, Vennesla, Norway.

Sampling

The sample was selected at the factory in Vennesla by an official from SINTEF Byggforsk.

It is not known to SP Fire Research if the product received is representative of the mean production characteristics.

The sample was received June 5, 2014 at SP Fire Research.

Test results

The test results are given in appendix 1 - 2 and photographs are shown in appendix 3. An explanation of the SBI-test parameters is given in appendix 4.

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.

Note

The accreditation referred to is valid for EN 13823 and EN ISO 11925-2.

SP Technical Research Institute of Sweden
Fire Research - Fire Dynamics

Performed by

Johan Post

Examined by

Per Thureson

Appendices

1 Test results, EN 13823

2 Test results, EN ISO 11925-2

3 Photographs

4 Test parameter explanation, EN 13823

Appendix 1

Test results, EN 13823:2010

Product

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Mounting

See photo 1 – 2, appendix 3.

The product was mounted according to EN 13823:2010, 5.2.2 a, e and i. It was fixed mechanically with screws to vertical wooden battens. The battens were placed between the product and a non-flame retardant treated particle board, which fulfils the requirements given in EN 13238. The product was tested with an air-gap of 40 mm.
The dimension of the tested ceiling panels provided both vertical and horizontal joints. In order to meet the end use mounting instructions, the EN 13823 description of a long wing with both horizontal and vertical joints(chapter 5.2.2 e) could not be achieved. The product is in its end use condition fixed lengthwise on the long side of the panels only. The crosswise joints are positioned halfway of the panels on each side – i.e. every 600 mm.

It was decided to test the product with a vertical joint 200 mm from the corner. A horizontal joint was positioned on a 500 mm height, but did not run along the complete width of the long wing.

Appendix 1

Test results

Test no	Test 1	Test 2	Test 3	Average
General information				
Test start, min:s	0:00	0:00	0:00	
Auxiliary burner ignited and adjusted, min:s	2:00	2:00	2:00	
Main burner ignited, min:s	5:00	5:00	5:00	
Main burner stopped, min:s	26:00	26:00	26:00	
Observations				
Flaming droplets or particles	No	No	No	
Burning droplets or particles, > 10 s	No	No	No	
Lateral flame spread until the edge, LFS	No	No	No	
Fire performance, see graph no 3 to 6				
$FIGRA_{0.2MJ}$, W/s	16	47	62	42
$FIGRA_{0.4MJ}$, W/s	16	47	62	42
$SMOGRA$, m^2/s^2	3.7	24	8.2	12
THR_{600s}, MJ	1.4	1.2	1.2	1.3
TSP_{600s}, m^2	42	38	40	40

Observations made during the tests

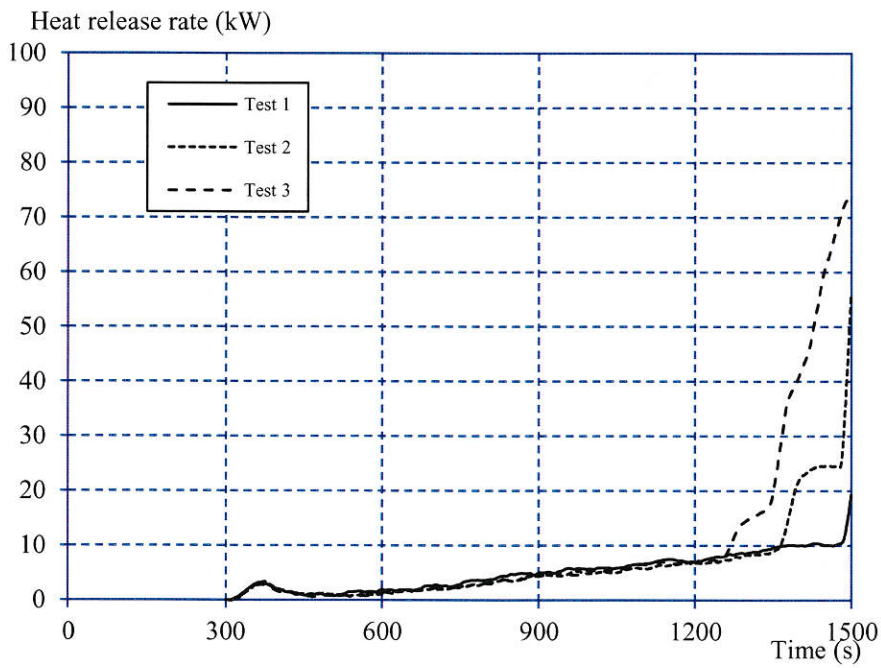
None.

Method of smoke calculation

The smoke production rate, SPR, of the burner was calculated using data from the auxiliary (secondary) burner according to EN 13823:2010, A.6.1.2.

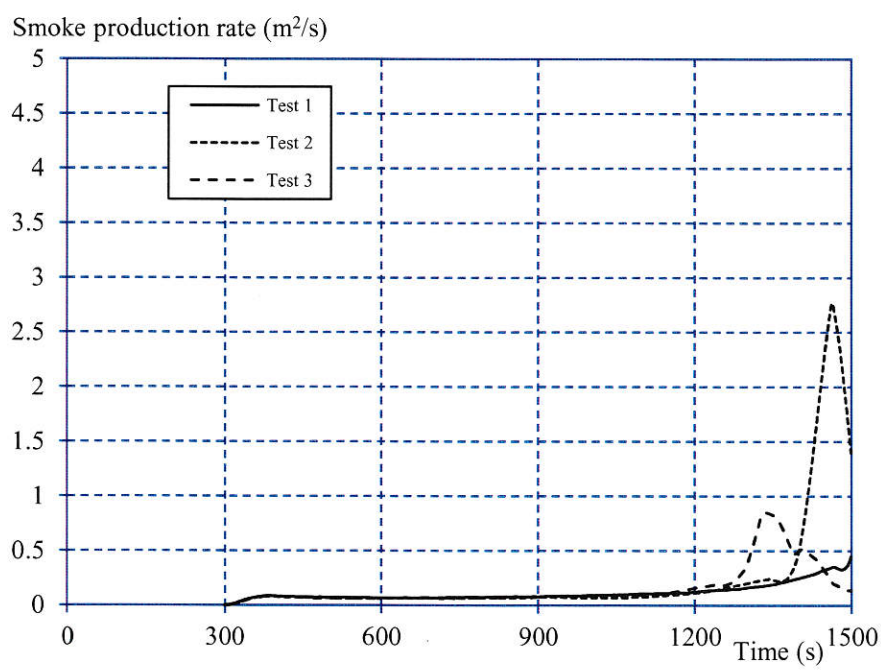
Appendix 1

Graph of heat release rate (HRR_{av})



Graph 1 Heat release rate (burner excluded), 30 seconds running average value.

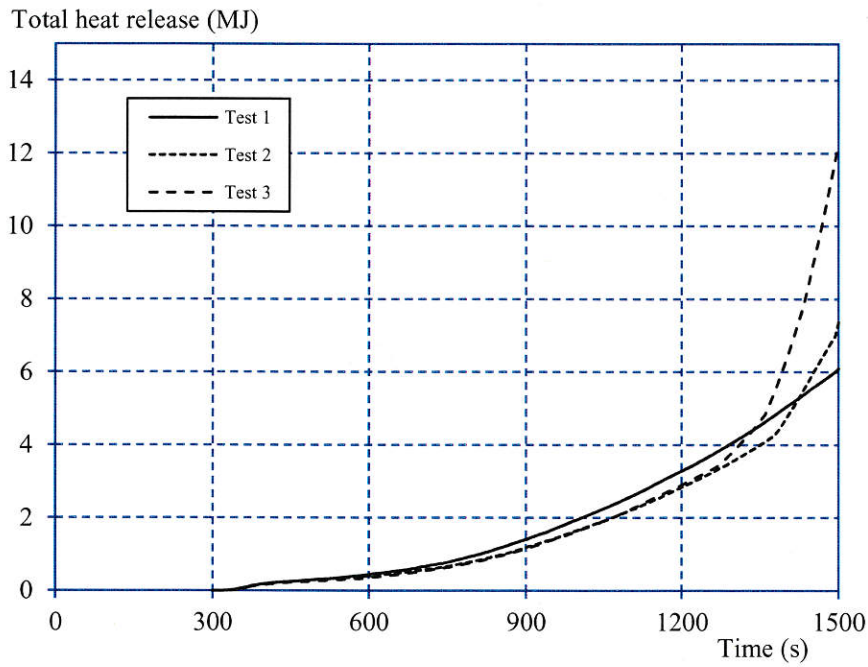
Graph of smoke production rate (SPR_{av})



Graph 2 Smoke production rate (burner excluded), 60 seconds running average value.

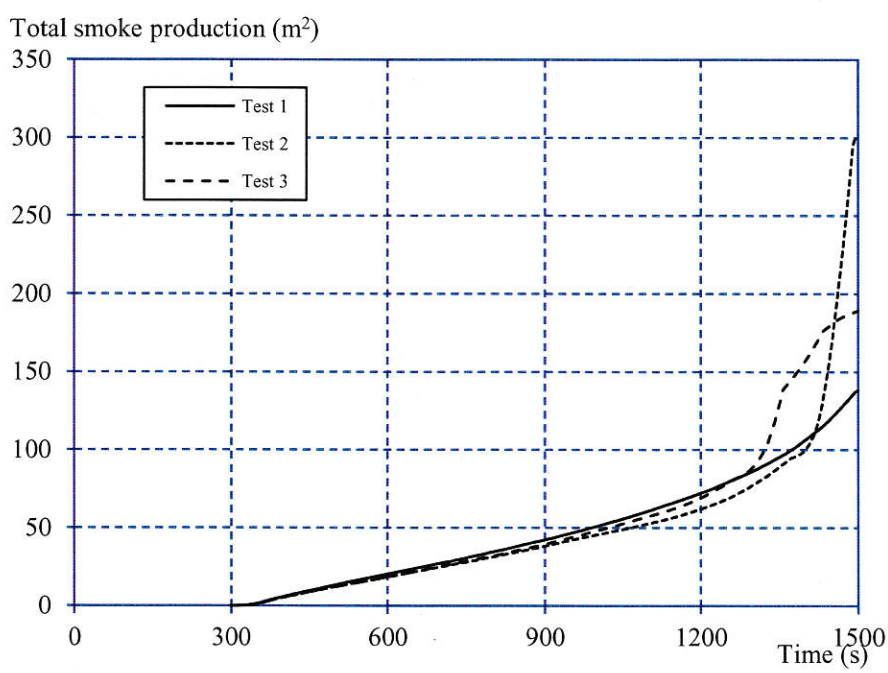
Appendix 1

Graph of total heat release (*THR*)



Graph 3 *Total heat release (burner excluded).*

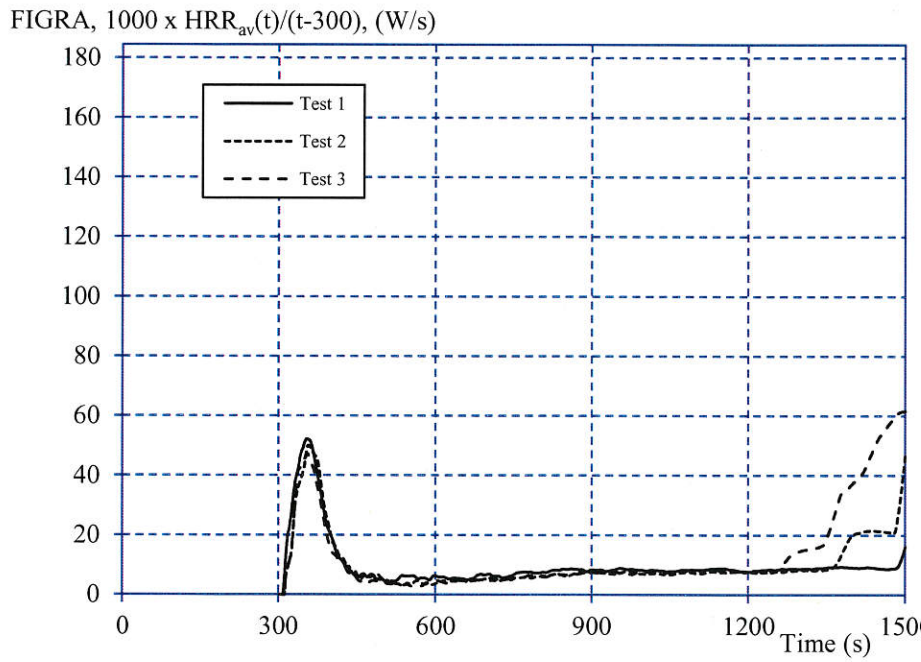
Graph of total smoke production (*TSP*)



Graph 4 *Total smoke production (burner excluded).*

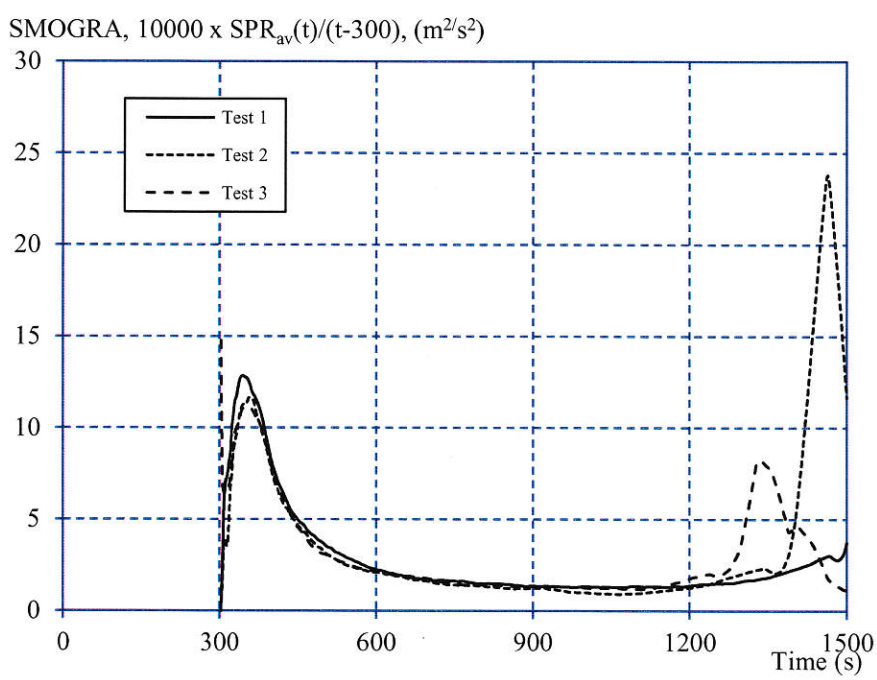
Appendix 1

Graph of FIre Growth RAte index (*FIGRA*)



Graph 5 Fire growth rate index.

Graph of SMOke Growth RAte index (*SMOGRA*)



Graph 6 Smoke growth rate index.

Appendix 1

Note

Graphs 5 and 6 show the time relationships of *FIGRA* and *SMOGRA* respectively without applying the threshold values, see EN 13823, paragraph A.5.3 and A.6.3. Therefore the reported single maximum values of $FIGRA_{0,2MJ}$, $FIGRA_{0,4MJ}$ and *SMOGRA* may be smaller than shown in the graphs as the threshold values are applied in this case.

Measured data

Thickness 10.5 – 11.1 mm.

Density 860 - 940 kg/m^3.

Conditioning
According to EN 13238 and EN 13823:2010.

Temperature (23 ± 2) °C.
Relative humidity (50 ± 5) %.

Date of test

August 7 and 13, 2014.

Appendix 2

Test results – EN ISO 11925-2:2010

Product

The following product information was received from the client:

Wood fibre panel with a nominal thickness of 10.7 + 0.4/-0.7 mm and a nominal density of 835 ± 40 kg/m^3. The wood fibre panels is painted with a fire retardant paint called "Brannitmaling" with a nominal area weight of 360 g/m^2. A top coat and protective lacquer of white acrylic paint is applied with a nominal area weight of 55 g/m^2.
The complete product has a nominal thickness of 11.0 ± 0.2 mm and a nominal density of 795 – 875 kg/m^3.

Application

Surface exposure. Flame exposure time was 30 seconds.

Test results

Test no	1	2	3	4	5	6
Direction	↑	↑	↑	→	→	→
The sample ignited, s	NI	NI	NI	NI	NI	NI
The flames reach 150 mm, s	-*	-*	-*	-*	-*	-*
Burning droplets	No	No	No	No	No	No
Time when filter paper ignited, s	-	-	-	-	-	-

NI = No ignition.

Appendix 2

Application

Edge exposure. Flame exposure time was 30 seconds.

Test results

Test no	1	2	3	4	5	6
Direction	↑	↑	↑	→	→	→
The sample ignited, s	11	8	9	9	11	10
The flames reach 150 mm, s	-*	-*	-*	-*	-*	-*
Burning droplets	No	No	No	No	No	No
Time when filter paper ignited, s	-	-	-	-	-	-

*Flaming ceased before the flame tip reached 150 mm.

Edge exposure, specimen turned 90 °round its vertical axis. Flame exposure time was 30 seconds.

Test results

Test no	1	2	3	4	5	6
Direction	↑	↑	↑	→	→	→
The sample ignited, s	3	3	3	3	3	3
The flames reach 150 mm, s	-*	-*	-*	-*	-*	-*
Burning droplets	No	No	No	No	No	No
Time when filter paper ignited, s	-	-	-	-	-	-

*Flaming ceased before the flame tip reached 150 mm.

Measured data

Thickness 10.5 – 11.1 mm.

Density 860 - 940 kg/m^3.

Conditioning

According to EN 13238:2010.

Temperature (23 ± 2) °C.

Relative humidity (50 ± 5) %.

Date of test

August 18, 2014.

Appendix 3

Photographs

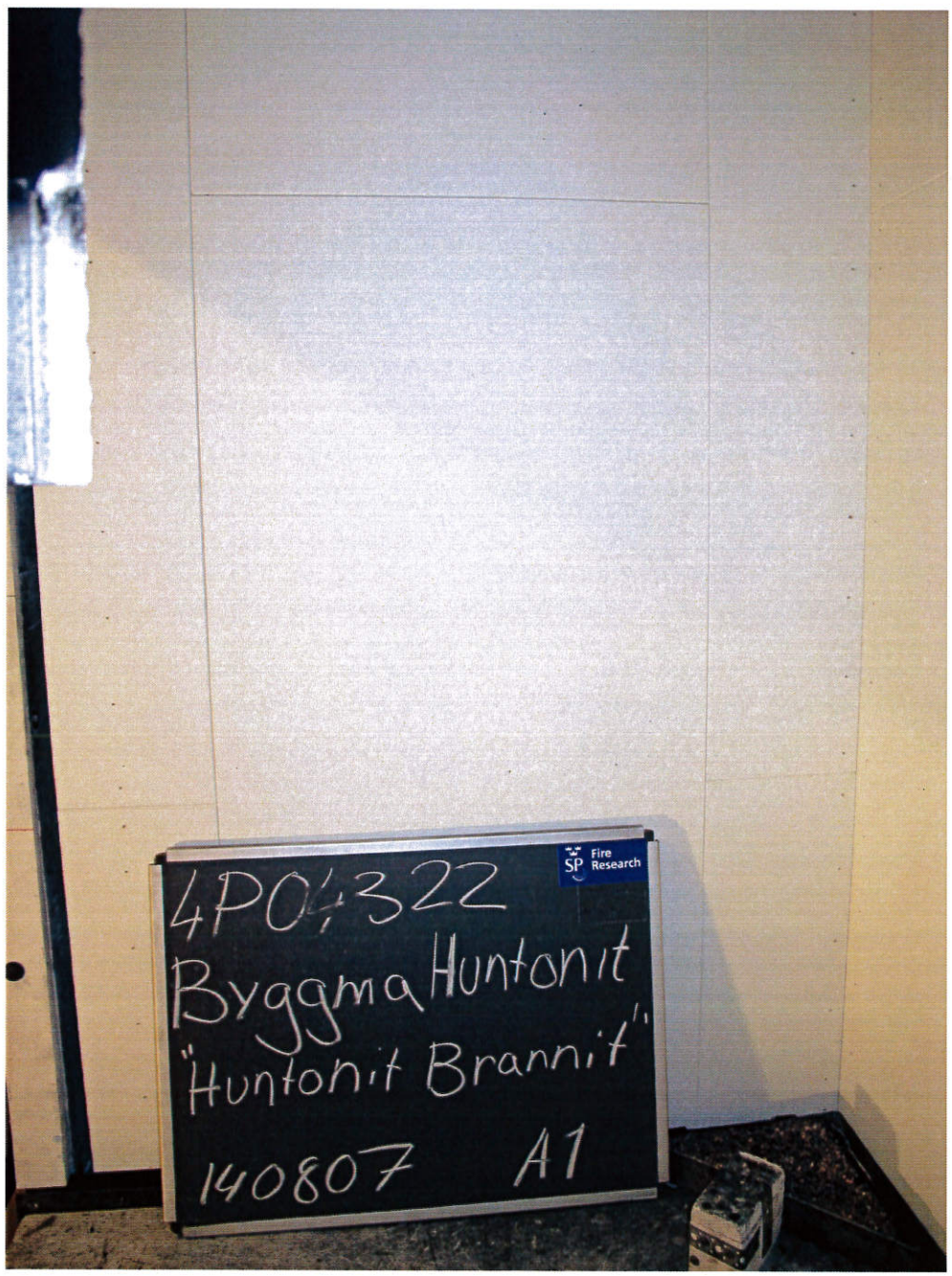


Photo no 1 Prior to test "Huntonit Brannit with Palett"

The exposed surface of the long wing.

Appendix 3

Photo no 2 Prior to test "Huntonit Brannit with Palett"

The vertical outer edge of the long wing at a height of 500 mm above the floor of the trolley.

Appendix 3

Photo no 3 After test "Huntonit Brannit with Palett"

Impact of flames in the burner corner.

Appendix 4

Test parameter explanation – EN 13823:2010 (SBI method)

Parameter	Explanation
Test start	Start of data collection.
End of test	26:00 (min:s) after test start.
HRR_{av}, maximum, kW	Peak Heat Release Rate of material between ignition of the main burner and end of test (burner heat output excluded), as a 30 seconds running average value.
SPR_{av}, maximum, m^2/s	Peak Smoke Production Rate of material between ignition of the main burner and end of test (burner heat output excluded), as a 60 seconds running average value.
$FIGRA_{0,2MJ}$, W/s	FIre Growth RAte index is defined as the maximum of the quotient $HRR_{av}(t)/(t-300s)$, multiplied by 1000. During 300 s ≤ t ≤ 1500 s, threshold value 3 kW and 0.2 MJ.
$FIGRA_{0,4MJ}$, W/s	FIre Growth RAte index is defined as the maximum of the quotient $HRR_{av}(t)/(t-300s)$, multiplied by 1000. During 300 s ≤ t ≤ 1500 s, threshold value 3 kW and 0.4 MJ.
$SMOGRA$, m^2/s^2	SMOke Growth RAte index is defined as the maximum of the quotient $SPR_{av}(t)/(t-300s)$, multiplied by 10 000. During 300 s ≤ t ≤ 1500 s, threshold value 0.1 m^2/s and 6 m^2.
THR_{600s}, MJ	Total heat release of the sample during 300 s ≤ t ≤ 900 s.
TSP_{600s}, m^2	Total smoke production of the sample during 300 s ≤ t ≤ 900 s.