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REPORT
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Fire test according to EN 13823, 2002 (SBI method)

(5 appendices)

Product

According to the client:
Tiles manufactured from high density glass wool. The front surface consisting of a grey plaster and the back surface of the tile is free or covered with an unpainted glass tissue. The edges are unprimed. The thickness of the tile is 22 - 42 mm.

The following product is covered in this document:

- Lithos/Albus

The different components of the product and the description of each component is shown in appendix 1.

The details of the tested product are described in the appendixes with the test results.

Manufacturer

Core and back surface: Saint-Gobain Ecophon AB, Hyllinge, Sweden.
Front surface: Intex Acoustics AB, Oskarström, Sweden.

Purpose of test

Basis for technical fire classification.

Tests performed

The product mentioned above is manufactured in the following versions:

Lithos/Albus A 42
Lithos/Albus A 22
Lithos/Albus C 22

Where the designations A and C refers to different edge types and 42 and 22 refers to different thicknesses.

According to clause 3.2, 3.3, 3.9 and 3.15 in the document “Fire Sector Group Recommendation 009, Fire testing and classification protocol for mineral wool products” the test needed for a classification of these versions of above mentioned product is:

	Thickness (mm)	Density of glass wool (kg/m^3)
Lithos/Albus A 42	42	55
Lithos/Albus C 22	22	110

The back surface “DH 50” of the product Lithos/Albus is tested and reported in SP report P202590, dated 2003-08-27, revised 2004-06-16.

The influence of different substrates and voids in support of the technical classification for the product Lithos/Albus is tested and reported in SP report P204760E, dated 2003-09-17.

Sampling

The samples were selected and prepared under supervision of an official from SP at Intex Acoustic AB in Oskarström. They were received at SP, Fire Technology on March 29, 2005.

Test results

The test results are given in appendix 2 - 3 and photographs are shown in appendix 4. An explanation of the SBI-test parameters is given in appendix 5.

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.

SP Swedish National Testing and Research Institute
Fire Technology - Materials Reaction to Fire

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Appendices

1 Product description
2 Test results, EN 13823, Lithos/Albus A 42
3 Test results, EN 13823, Lithos/Albus C 22
4 Photographs
5 Test parameter explanation, EN 13823

Appendix 1

Product descriptions

Ecophon Lithos/Albus	
Components	*Description*
1. Front surface, outer layer	
Lithos Puts, Lithos Putsabsorbent	Grey plaster consisting of bentonite, pearlite, glass fibre, cellulose and water. Nominal thickness 3 mm and nominal dry area weight 360 g/m^2
2. Front surface, inner layer	
–	
3. Front surface layer adhesive	
–	
4. Core material	
ECO 22, ECO 26	Glass wool density 55 - 110 kg/m^3, binder content 7 - 9.5% (mineral oil content in binder 0 - 4%)
5. Core thickness	
Standard thickness (mm)	22 - 42
6. Edge types	
Standard edges	A, C
7. Edge paint	
–	
8. Back surface layer	
Free or DH 50	Glass tissue 50 g/m^2
9. Back surface layer adhesive	
None	The tissue is bonded to the glass wool by means of the binder during the production of the core material.

Appendix 2

Test results - EN 13823, 2002 (SBI method)

Product

According to the client:
Tile called “Lithos/Albus A 42” manufactured from high density glass wool. The front surface consisting of a grey plaster and the back surface of the tile is free. The edges are unprimed. The thickness of the tile is 42 mm. Production date 2005-02-15.

Ecophon Lithos/Albus	
Components	*Description*
1. Front surface, outer layer	
Lithos Puts, Lithos Putsabsorbent	Grey plaster consisting of bentonite, pearlite, glass fibre, cellulose and water. Nominal thickness 3 mm and nominal dry area weight 360 g/m^2
2. Front surface, inner layer	
–	
3. Front surface layer adhesive	
–	
4. Core material	
ECO 22	Glass wool density 55 kg/m^3, binder content 7% (mineral oil content in binder 4%)
5. Core thickness	
Standard thickness (mm)	42
6. Edge types	
Standard edges	A
7. Edge paint	
–	
8. Back surface layer	
–	
9. Back surface layer adhesive	
–	

Mounting

See photo 1-2, enclosure 4.

The product was mounted according to EN 13823:2002, 5.2.2 b. It was fixed mechanically with screws and washers to a non-flame retardant treated particle board, for internal use. The particle board non-FR treated, for internal use fulfil the requirements given in EN 13238. The side with grey plaster was exposed.

Appendix 2

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	0	0	0	0
$FIGRA_{0,4MJ}$, W/s	0	0	0	0
SMOGRA, m^2/s^2	1	2	1	1
THR_{600s}, MJ	0.8	0.9	0.7	0.7
TSP_{600s}, m^2	24	27	23	25

Observations made during the tests

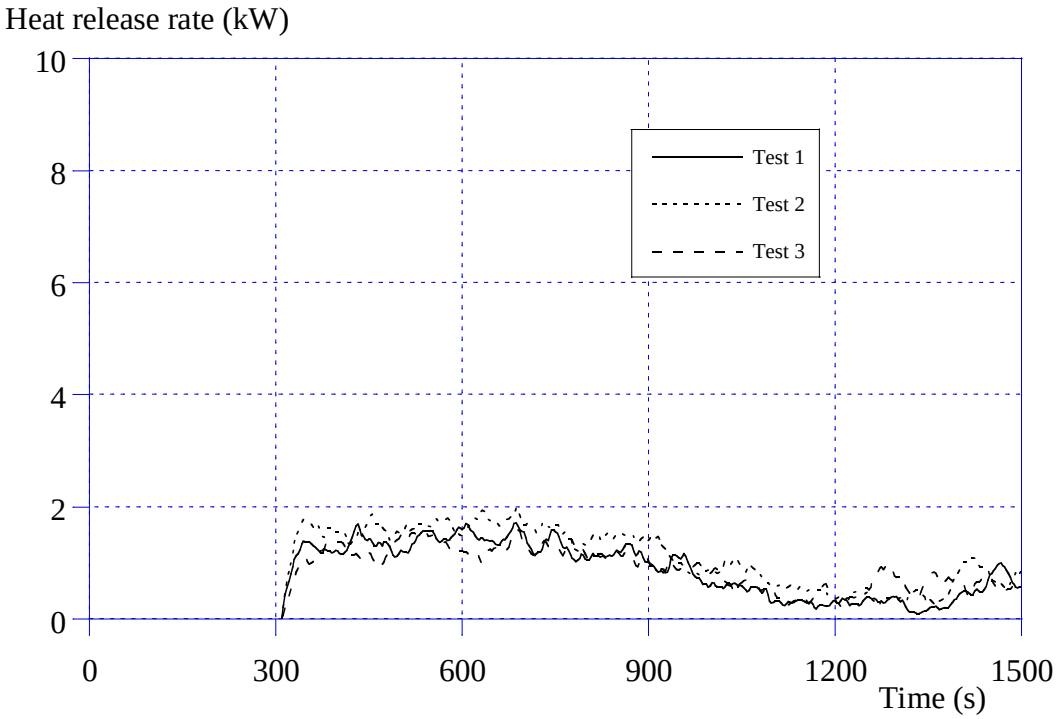
The substrate ignited in the end of all tests.

Deviation from standard

None.

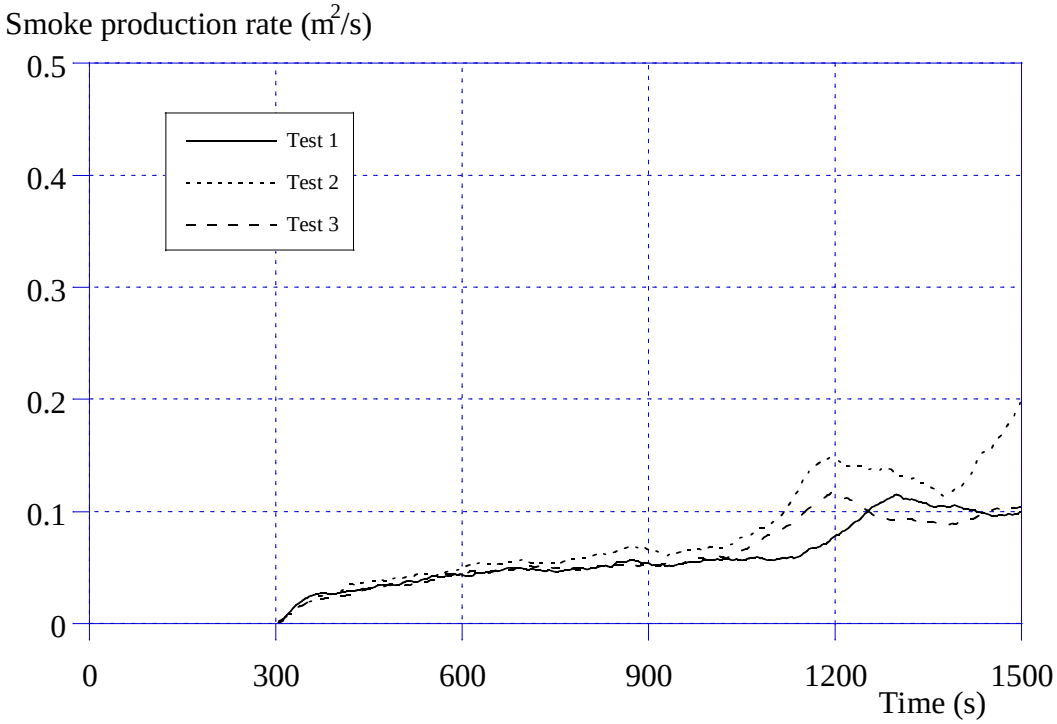
Appendix 2

Graph of heat release rate (HRR_{av})



Graph 1 *Heat release rate (burner excluded) for "Lithos/Albus A 42", 30 seconds running average value.*

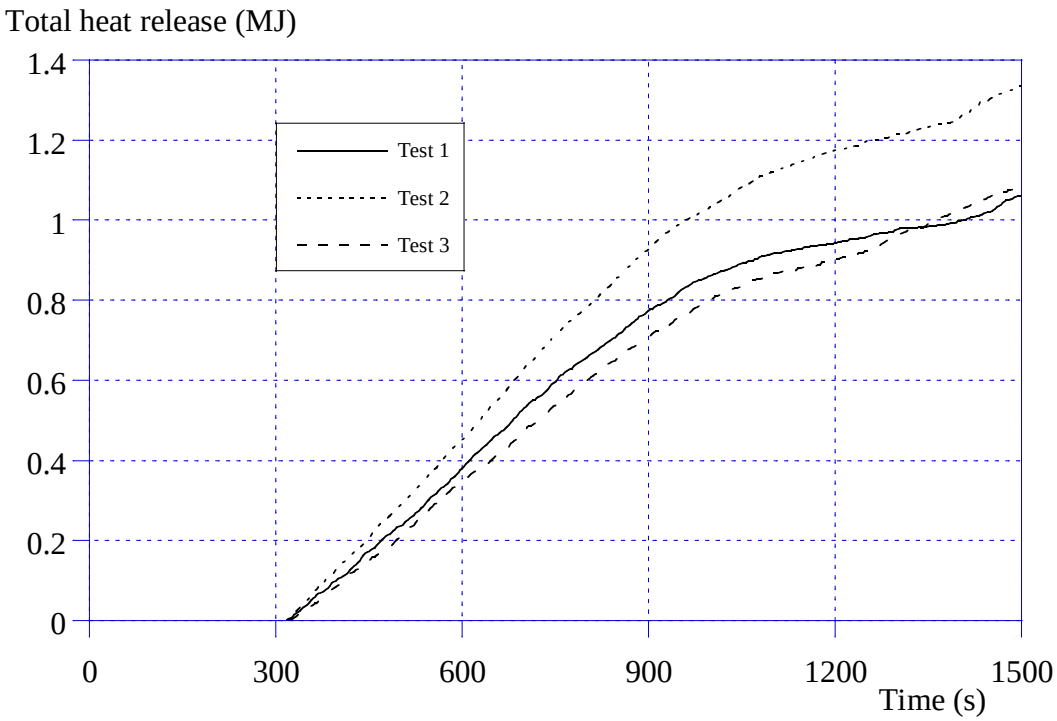
Graph of smoke production rate (SPR_{av})



Graph 2 *Smoke production rate (burner excluded) for "Lithos/Albus A 42", 60 seconds running average value.*

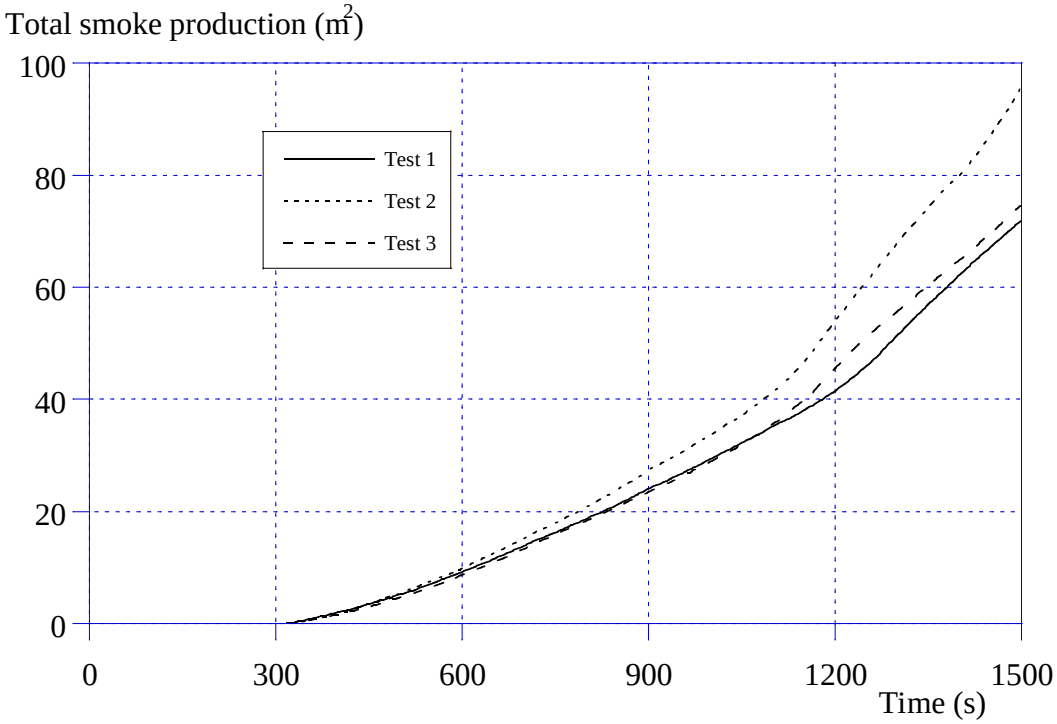
Appendix 2

Graph of total heat release (*THR*)



Graph 3 Total heat release (burner excluded) for "Lithos/Albus A 42".

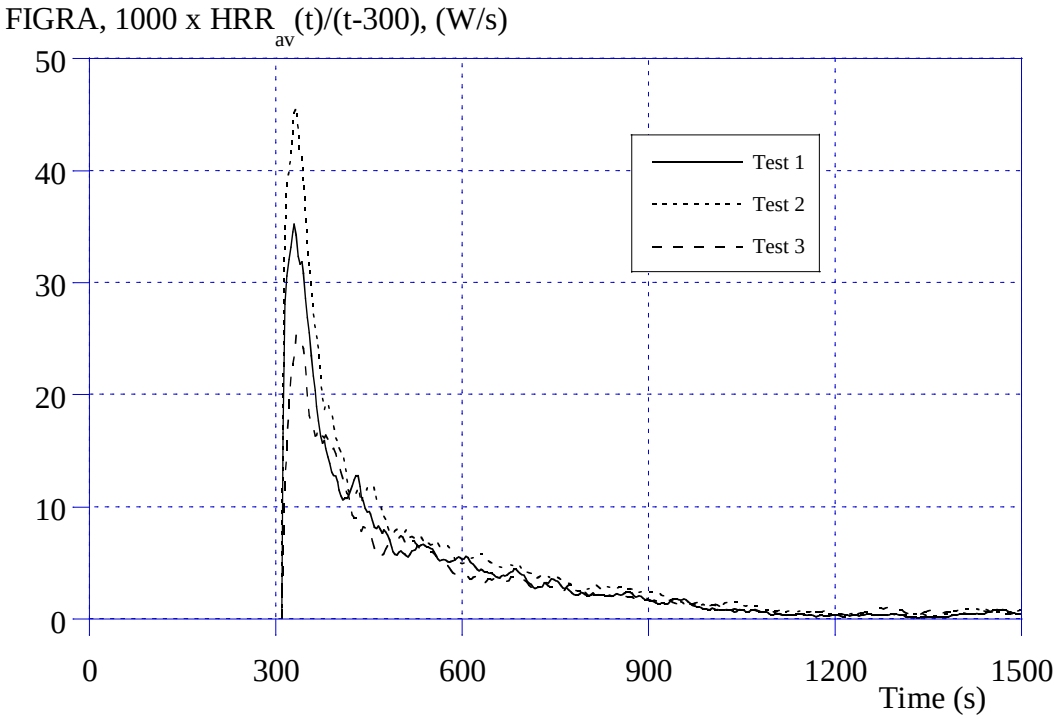
Graph of total smoke production (*TSP*)



Graph 4 Total smoke production (burner excluded) for "Lithos/Albus A 42".

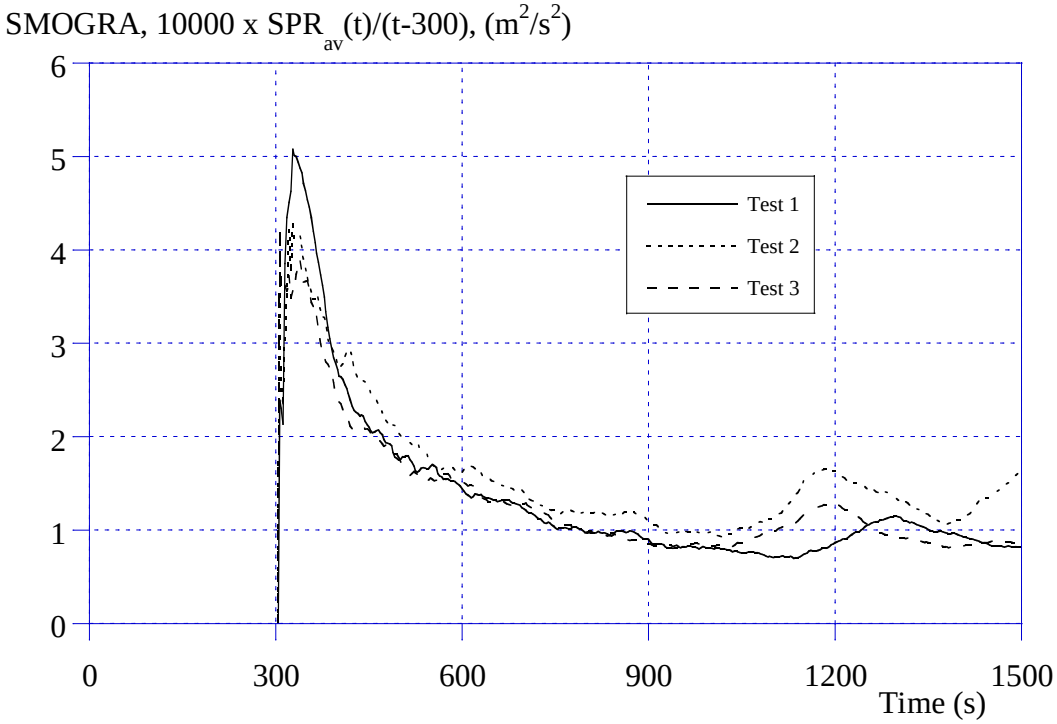
Appendix 2

Graph of FIre Growth RAte index (*FIGRA*)



Graph 5 Fire growth rate index for "Lithos/Albus A 42".

Graph of SMOke Growth RAte index (*SMOGRA*)



Graph 6 Smoke growth rate index for "Lithos/Albus A 42".

Appendix 2

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, whole product, 42 mm approximately.
Density, whole product, 66 kg/m^3 approximately.

Thickness, core material, 40 mm approximately.
Density, core material, 57 kg/m^3 approximately.

Thickness, front surface, 2.0 - 2.8 mm.
Area weight, front surface, 360 g/m^2 approximately.

Conditioning

According to EN 13238, 2002.

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

Constant mass:
Mass 1: 1617 g
Mass 2: 1617 g
Time : 24 h

Date of test

March 30, 2005.

Appendix 3

Test results - EN 13823, 2002 (SBI method)

Product

According to the client:
Tile called “Lithos/Albus C 22” manufactured from high density glass wool. The front surface consisting of a grey plaster and the back surface of the tile is covered with an unpainted glass tissue. The edges are unprimed. The thickness of the tile is 22 mm. Production date 2005-02-15.

Ecophon Lithos/Albus	
Components	*Description*
1. Front surface, outer layer	
Lithos Puts, Lithos Putsabsorbent	Grey plaster consisting of bentonite, pearlite, glass fibre, cellulose and water. Nominal thickness 3 mm and nominal dry area weight 360 g/m^2
2. Front surface, inner layer	
–	
3. Front surface layer adhesive	
–	
4. Core material	
ECO 26	Glass wool density 110 kg/m^3, binder content 9.5% (mineral oil content in binder 0%)
5. Core thickness	
Standard thickness (mm)	22
6. Edge types	
Standard edges	C
7. Edge paint	
–	
8. Back surface layer	
DH 50	Glass tissue 50 g/m^2
9. Back surface layer adhesive	
None	The tissue is bonded to the glass wool by means of the binder during the production of the core material.

Mounting

See photo 4-5, enclosure 4.

The product was mounted according to EN 13823:2002, 5.2.2 a. It was fixed mechanically with screws from behind on to a steel frame. The fixing was used only in order to keep the insulation board in place during testing. The frame was placed against a non-flame retardant treated particle board. The particle boards fulfil the requirements given in EN 13238. A distance of approximately 40 mm was used between the substrate and product. The panels in accordance with EN 13823:2002, 4.4.11 were removed. The side with grey plaster was exposed.

Appendix 3

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	15	13	15	14
$FIGRA_{0,4MJ}$, W/s	15	13	15	14
SMOGRA, m^2/s^2	0	0	0	0
THR_{600s}, MJ	1.4	1.4	1.4	1.4
TSP_{600s}, m^2	24	23	22	23

Observations made during the tests

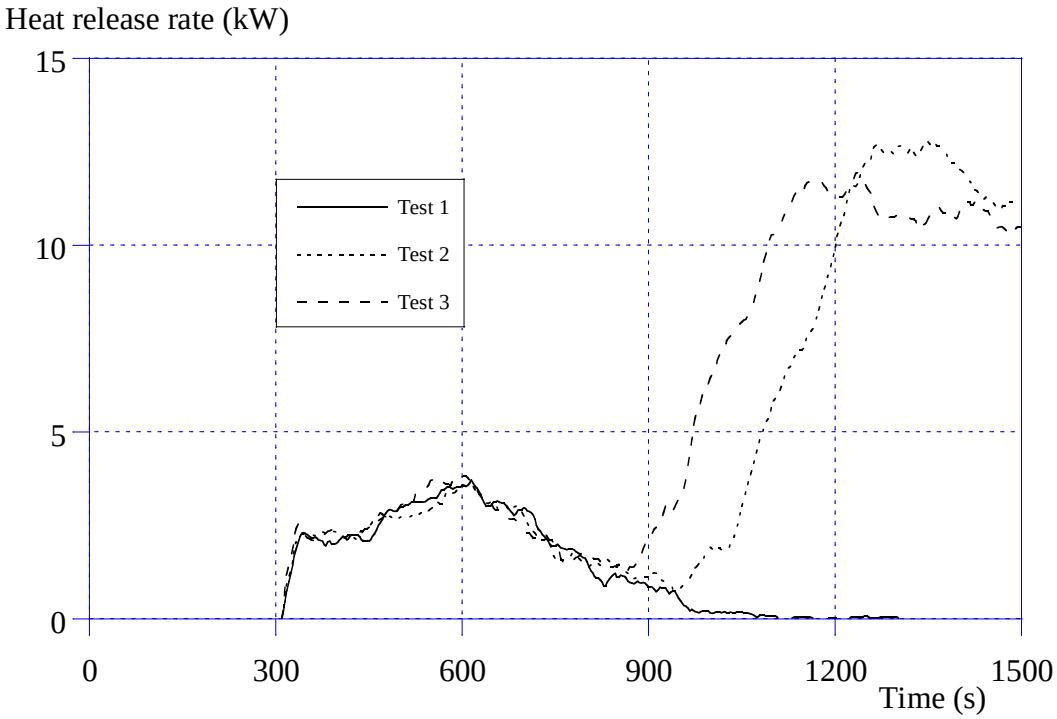
The substrate ignited after approximately 12 minutes in test no 2 and 3.

Deviation from standard

None.

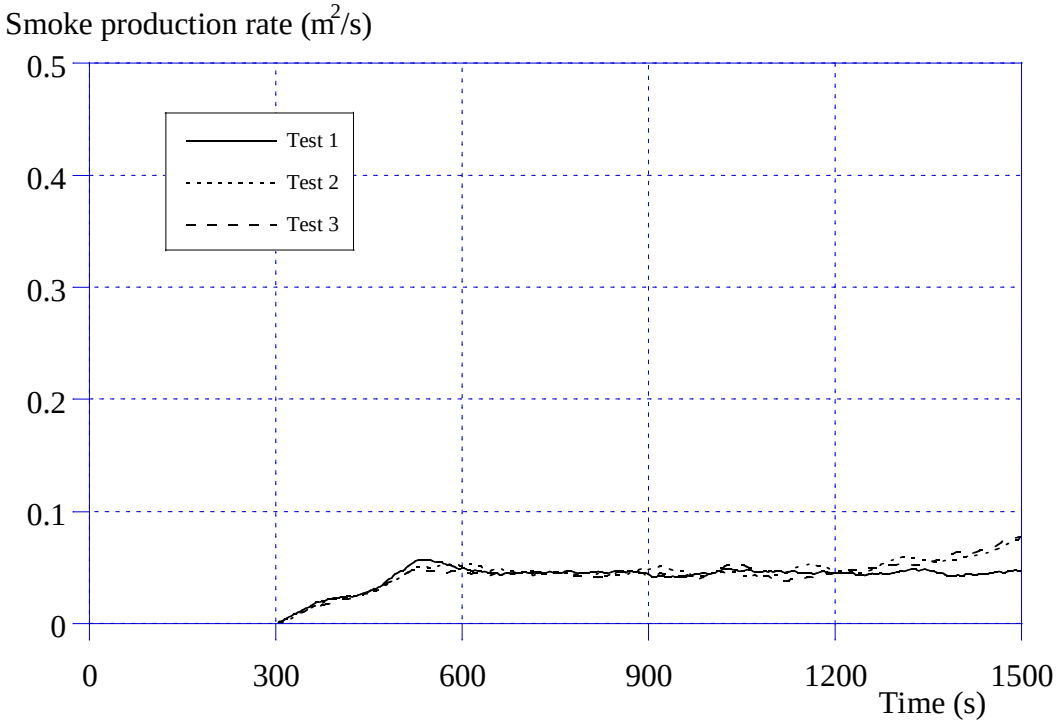
Appendix 3

Graph of heat release rate (HRR_{av})



Graph 1 *Heat release rate (burner excluded) for "Lithos/Albus C 22", 30 seconds running average value.*

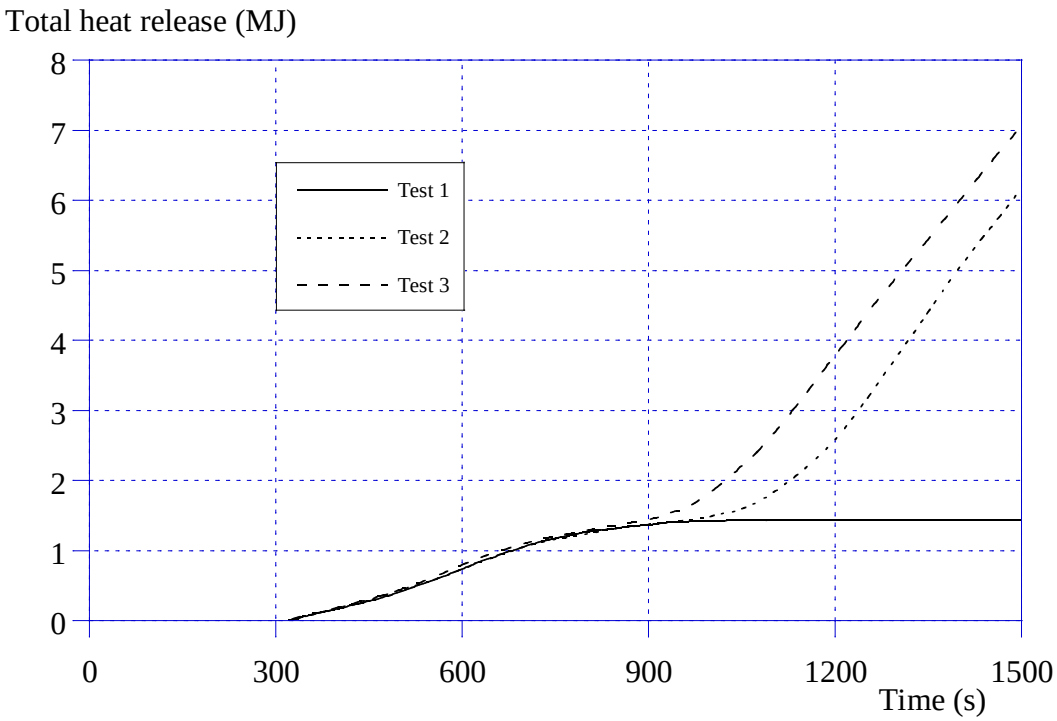
Graph of smoke production rate (SPR_{av})



Graph 2 *Smoke production rate (burner excluded) for "Lithos/Albus C 22", 60 seconds running average value.*

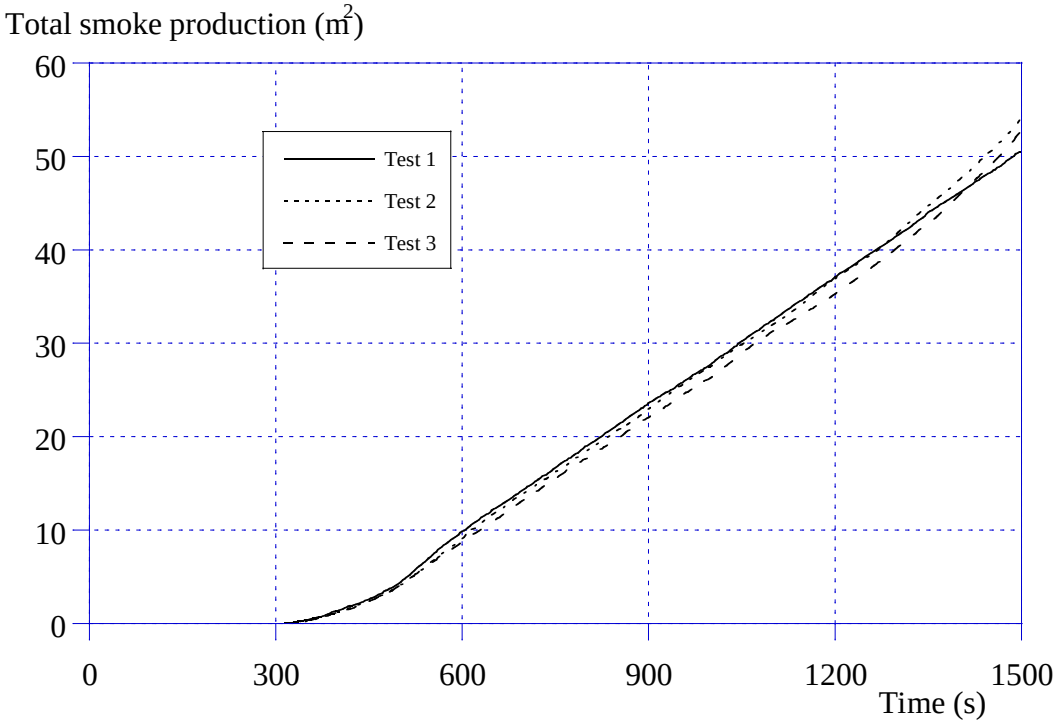
Appendix 3

Graph of total heat release (*THR*)



Graph 3 Total heat release (burner excluded) for "Lithos/Albus C 22".

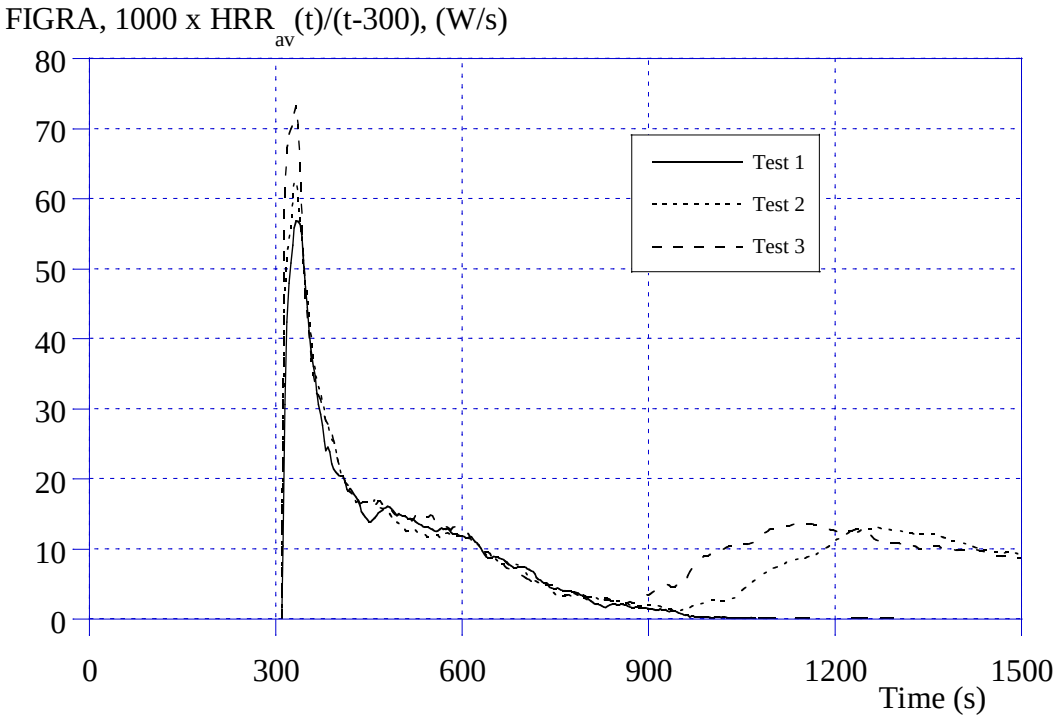
Graph of total smoke production (*TSP*)



Graph 4 Total smoke production (burner excluded) for "Lithos/Albus C 22".

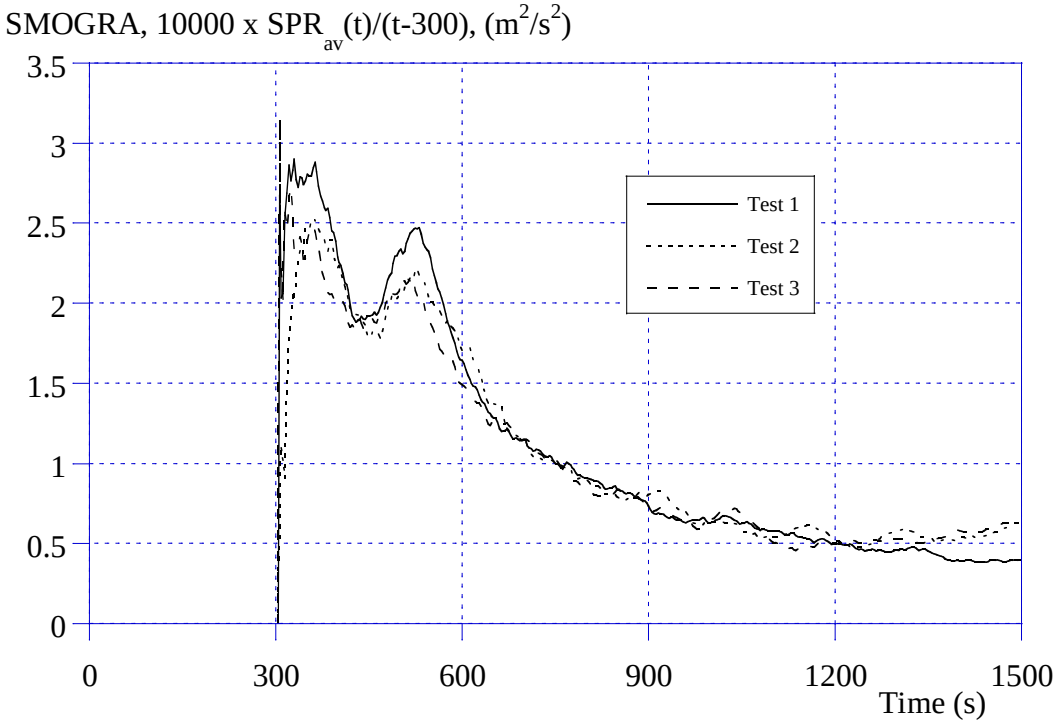
Appendix 3

Graph of FIre Growth RAte index (*FIGRA*)



Graph 5 Fire growth rate index for "Lithos/Albus C 22".

Graph of SMOke Growth RAte index (*SMOGRA*)



Graph 6 Smoke growth rate index for "Lithos/Albus C 22".

Appendix 3

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, whole product, 20 mm approximately.
Density, whole product, 122 - 128 kg/m^3.

Thickness, core material, 19 mm approximately.
Density, core material, 111 kg/m^3 approximately.

Thickness, front surface, 2.0 - 2.8 mm.
Area weight, front surface, 360 g/m^2 approximately.

Conditioning

According to EN 13238, 2002.

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

Constant mass:
Mass 1: 1781 g
Mass 2: 1782 g
Time : 72 h

Date of test

April 4 and 8, 2005.

Appendix 4

Photographs

Photo no 1 Prior to test "Lithos/Albus A 42"

The exposed surface of the long wing.

Photo no 2 Prior to test "Lithos/Albus A 42"

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

Appendix 4

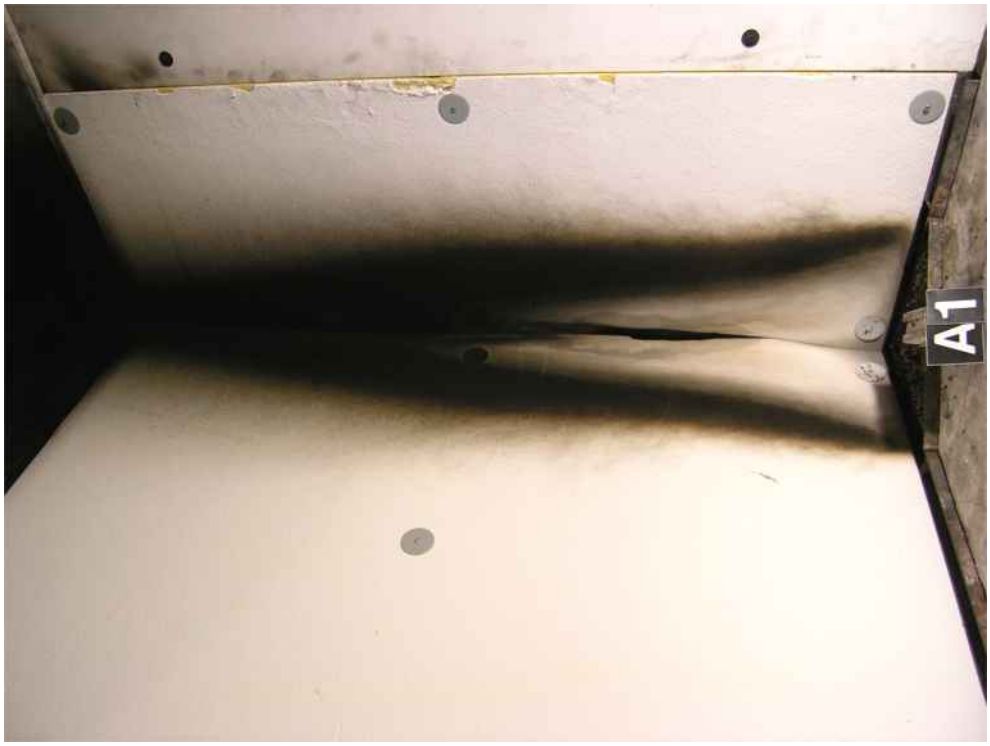


Photo no 3 After test "Lithos/Albus A 42"

Photo no 4 Prior to test "Lithos/Albus C 22"

The exposed surface of the long wing.

Appendix 4

Photo no 5 Prior to test "Lithos/Albus C 22"

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

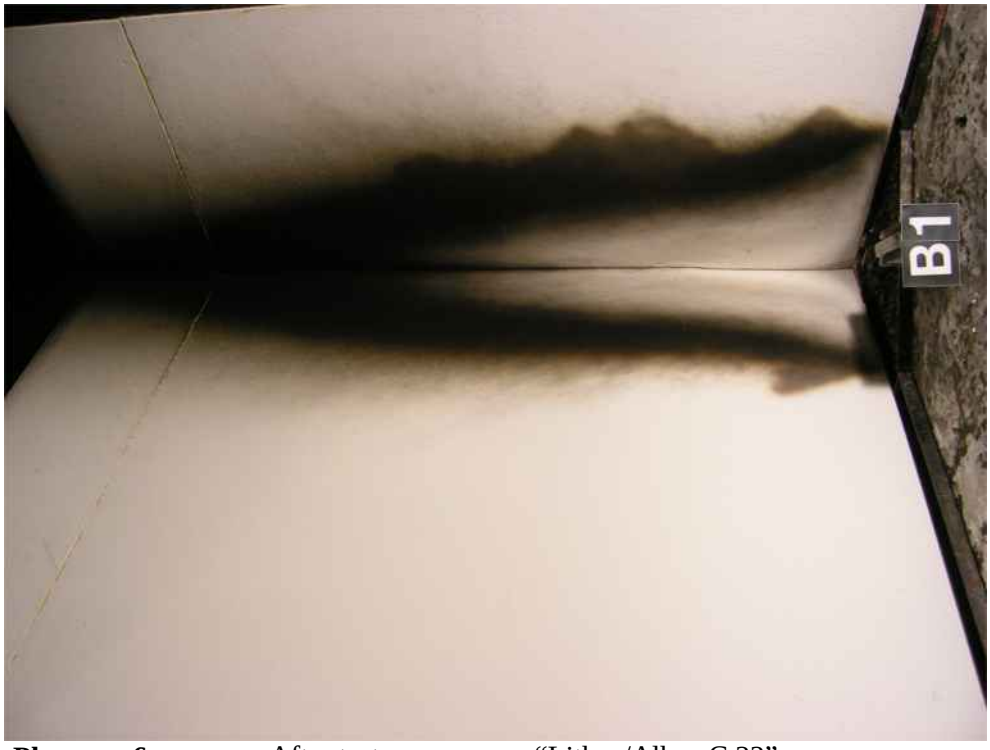


Photo no 6 After test "Lithos/Albus C 22"

Appendix 5

Test parameter explanation, SBI, EN 13823

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