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**Testreport**

**Project number:** 89208761  
**Report number:** 89208761.06br

**Date:**  
03/03/2016

**Received:**  
A resilient floor covering, marked as: "mFLOR Loose Lay 50-07";  
TÜV-reference: MT16-30626.03

**Project number:**  
89208761

**Report number:**  
89208761.06br

**Sampling procedure:**  
The samples are selected by the applicant. The test house has had no influence on the sampling procedure.

**Phone number client:**  
+44 1525714082

**Fax number client:**  
+44 1525714083

The samples have been received on: 18/01/2016

**Order:**  
Classification of burning behaviour according to EN 13501-1:2007: A1:2009.

**Article:**  
mFLOR Loose Lay 50-07

Test methods: Ignitability of products subjected to direct impingement of flame (ISO 11925-2:2010/C1:2011) and determination of the burning behaviour using a radiant heat source (ISO 9239-1:2010)

**Appendix:**  
- none -

**Results:**  
See page three and four.

**Appendix:**  
See page five up to and including twelve.

TÜV applies General Terms & Conditions which are filed at the office of the Clerk for civil affairs at the Court in Zuylen (The Netherlands) under number 35627/0, dated November 17th 2010.

## PRODUCT IDENTIFICATION

Applicant : Endesign Limited  
Name : mFLOR Loose Lay 50-07\*  
Type of product : Resilient, PVC, heterogeneous  
Type of colouring/patterning : Wood pattern  
Pattern nr. : 70294\*  
Batch nr. : 15.09.16\*  
Dimensions (mm) : 184.2 x 1219.2 (planks)\*  
Total thickness (mm) : 5.0 \*  
Thickness of wear layer (mm) : 0.7\*  
Type : I, wear-layer binder content >80%\*  
Finish : PU finish\*

Total thickness (mm) : 2.95\*\*  
Total mass (gr/m<sup>2</sup>) : 8490\*\*  
Density (kg/m<sup>3</sup>) : 1715\*\*

\* Applicant's declaration

\*\* Determination by the test house after conditioning to constant mass & air-drywt.

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Figure 1. Picture of the received sample



Figure 2. Picture of the received sample (back)

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**TEST RESULTS**
***Ignitability of products subjected to direct impingement of flame***

Method EN ISO 11925-2 :2010/C1:2011

Date of testing : 17/02/2016  
 Conditioning time, climate :  $\geq 7$  days,  $23 \pm 2$  °C and  $50 \pm 5$  %  
 Description of substrate : Fibre cement board,  $8 \pm 2$  mm,  $1800 \pm 200$  kg/m<sup>3</sup>  
 conforming to EN 13238.  
 Flame application : Surface.  
 Flame application time : 15 seconds.

Orientation:	Length			Width		
Total burning time <sup>1</sup>	15	15	15	15	15	15
Flame tip reaches 150 mm (s)	No	No	No	No	No	No
Extent of damaged area, length (mm)	50	53	53	55	53	53
Extent of damaged area, width (mm)	12	12	12	12	12	12
Material melts (yes/no)	Yes	Yes	Yes	Yes	Yes	Yes
Shrinks away <sup>2</sup> (yes/no)	No	No	No	No	No	No
Glowing <sup>3</sup> (sec)	No	No	No	No	No	No
Flaming debris (yes/no)	No	No	No	No	No	No
Ignition of filter paper (yes/no)	No	No	No	No	No	No

<sup>1</sup> The use of a flame application time of 15 or 30 seconds with surface or edge impingement

<sup>2</sup> Shrinks away from flame without being ignited

<sup>3</sup> The time at which it occurs and its duration

***Determination of the burning behaviour using a radiant heat source***

Method EN ISO 9239-1:2010

Date of testing : 17/02/2016  
 Conditioning time, climate :  $\geq 7$  days,  $23 \pm 2$  °C and  $50 \pm 5$  %  
 Description of substrate : Fibre cement board,  $8 \pm 2$  mm,  $1800 \pm 200$  kg/m<sup>3</sup>  
 conforming to EN 13238.  
 Sampling procedure : By contractor.  
 Description of cleaning used : None.  
 Fixing method : None, sample is tested loose laid on the substrate.

Test specimen, orientation	Flame spread (cm)	CRF (kW/m <sup>2</sup> )	Peak light attenuation (%)	Smoke production (%.min)
1, Length	15.0	9.6	32.0	123
2, Width	14.0	10.1	28.9	112
3, Length	14.0	10.1	32.0	100
4, Length	22.0	8.6	28.5	198
<b>Mean, Length</b>	<b>16,7</b>	<b>9,6</b>	<b>29,8</b>	<b>137</b>

Specimen 1, 2, 3 and 4: Flashing, transitory- or sustained flaming are observed.

Specimen 1, 2, 3 and 4: Extinguished naturally before the end of the test duration.

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## CONCLUSION

According to EN 13501-1:2007+ A1:2009 the tested sample of the aforementioned quality "mFLOR Loose Lay 50-07", in relation to its reaction to fire behaviour is classified: **B<sub>0</sub>**.

The additional classification in relation to smoke production is: **s1**.

The aforementioned quality meets the requirement of reaction to fire classification: <b>B<sub>0</sub> - s1</b>
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The classification is valid for the following end use applications:

- End use substrates of classes A1 and A2-s1,d0, for example fibre cement board.
- Any way of fixation, glued down or loose laid.

### Statements:

The test results only relate to the behaviour of the test specimens of the examined product under the particular conditions of the test in laboratory conditions; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use. The method might not be suitable if the product is exposed to much larger flames or heat radiant sources.

The validity of this report will expire directly after alterations or modifications of the examined product (combination)(s) and/or the criteria. This report shall not be reproduced, except in full, without the written approval of the testing laboratory.

This document does not represent type approval or certification of the product.

Author:  
Mr. J. de Wolf



Review:  
Mr. R. Boerboom



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(End of report)

Date  
03/03/2018

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83238781

Report number  
83238781.D6b-

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## APPENDIX I: Flooring Radiant Panel Single Specimen Report

Report number: 83238781, Date of Test: 03/03/2018, File name: 83238781.D6b-

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### Flooring Radiant Panel Single Specimen Report

Standard : EN ISO 9239-1:2010  
 Laboratory : TÜV Rheinland Nordwestfalen  
 Sponsor : Exdesign Limited (8970876)  
 Date of test : Feb. 17 2015

Specimen description : MFloor Loose Lay MT16-982000  
 Test name : F1 Prod  
 File name : D:\RPM\LLS\6020\7L\C8V  
 Test number in series : 14

Max calibration file name : CONFPSOUT2.SAW\CALIB\F1 X16007.CSV

Thickness (mm) : 4.95  
 Density (kg/m<sup>3</sup>) : 1713

Test duration : 17 minutes 29 seconds (1049 s)  
 Substrate used? : Yes  
 Substrate : Calcium silicate  
 Fixing method : None (dust free)  
 Conditioned? : Yes  
 Conditioning temp. (°C) : 23  
 Conditioning RH: (%) : 50

#### Test Results

Time to ignition : 2 minutes 09 seconds (123 s)  
 Time to flameout : 12 minutes 19 seconds (739 s)  
 Extent of burning (mm) : 170  
 Critical flux at extinguishment (kW/m<sup>2</sup>) : 9.56  
 HF-10 (kW/m<sup>2</sup>) : 9.91  
 HF-20 (kW/m<sup>2</sup>) : Not calculated (test duration < 20 minutes)  
 HF-30 (kW/m<sup>2</sup>) : Not calculated (test duration < 30 minutes)  
 Flame spread at 0 minutes (mm) : 150  
 Flame spread at 20 minutes (mm) : Not measured  
 Flame spread at 30 minutes (mm) : Not measured  
 Peak light attenuation (%) : 22.01  
 Time to peak light attenuation : 7 minutes 37 seconds (457 s)  
 Total integrated smoke (%.min) : 122.67  
 Potential glass/foe action : A2(1)B(0)  
 Smoke production classification : s1

This report refers only to the behaviour of the specimen of the 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.

## APPENDIX I: Flooring Radiant Panel Single Specimen Report

Report produced with the Fire Testing Technology (FTT) Software

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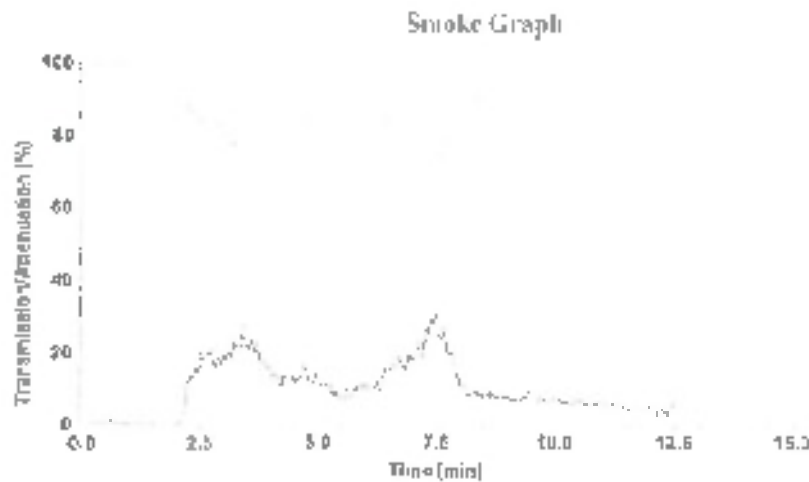
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Test name : #1 Test  
 File name : D:\F:\FTT\881602\070.CSV

### Rate Results

Position (mm)	Time (s)	Flux (kW/m²)	Q <sub>net</sub> (MJ/m²)	Position (mm)	Time (s)	Flux (kW/m²)	Q <sub>net</sub> (MJ/m²)
69	246	31.4	781.6	413	-	3.1	-
110	477	39.5	4098	563	-	2.9	-
160	657	47	6151	613	-	2.4	-
210	-	4.8	-	663	-	2.1	-
260	-	7.8	-	713	-	1.9	-
310	-	6.5	-	763	-	1.5	-
360	-	5.9	-	813	-	1.7	-
410	-	5.0	-	863	-	1.2	-
460	-	4.2	-	913	-	1.1	-

### Comments

Specimen as described in standard

This is a preliminary report to the behaviour of the specimen of the product under the particular conditions of the test, they are not final results. It is not 90% criteria for the success of the potential fire hazard of the product in use.

## APPENDIX I: Flooring Radiant Panel Single Specimen Report

Report generated by the Fire Service Technical File 227661 software

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### Flooring Radiant Panel Single Specimen Report

Standard	: EN ISO 9239-1:2016
Labouratory	: TÜV Rheinland Nederland B.V.
Sponsor	: endesign Limited 89208761
Date of test	: Feb 17 2016
Specimen description	: MFLor (Luxe Lay 82116 80x60 03
Test name	: m 2 Class
File name	: D:\PRJ\FILES\In20071\CSV
Test number in test set	: 4
File called in file name	: CALIBR\SOFT\2.9A\CALIBR\X16002.CSV
Thickness (mm)	: 4.95
Density (kg/m <sup>3</sup> )	: 1714
Test duration	: 13 minutes 54 seconds (834 s)
Substrate used?	: Yes
Substrate	: Calcium silicate
Fixing method	: None (loose laid)
Conditioned?	: Yes
Conditioning temp. (°C)	: 23
Conditioning RH (%)	: 53

#### Test Results

Time to ignition	: 2 minutes 04 seconds (124 s)
Time to flameout	: 13 minutes 52 seconds (832 s)
Extent of burning (mm)	: 140
Critical flux at extinguishment (kW/m <sup>2</sup> )	: 10.67
HF 10 (kW/m <sup>2</sup> )	: 10.67
HF 20 (kW/m <sup>2</sup> )	: Not calculated (test duration < 20 minutes)
HF 30 (kW/m <sup>2</sup> )	: Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm)	: 140
Flame spread at 20 minutes (mm)	: Not measured
Flame spread at 30 minutes (mm)	: Not measured
Peak light attenuation (%)	: 28.28
Time to peak light attenuation	: 3 minutes 27 seconds (207 s)
Total integrated smoke (s/m <sup>3</sup> )	: 1,187
Differential classification	: A2L(B)(B)
Smoke production classification	: s1

These results refer only to the behaviour of the specimen of the product under the particular conditions of the test. They are not intended to be taken in order to assess the performance based on the product only.

**APPENDIX I: Flooring Radiant Panel Single Specimen Report**

Report generated by: [www.tuv.com](http://www.tuv.com) | [www.tuv.com/knowledge](http://www.tuv.com/knowledge) | 4474411 | 01/2018

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03/03/2018

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89208781

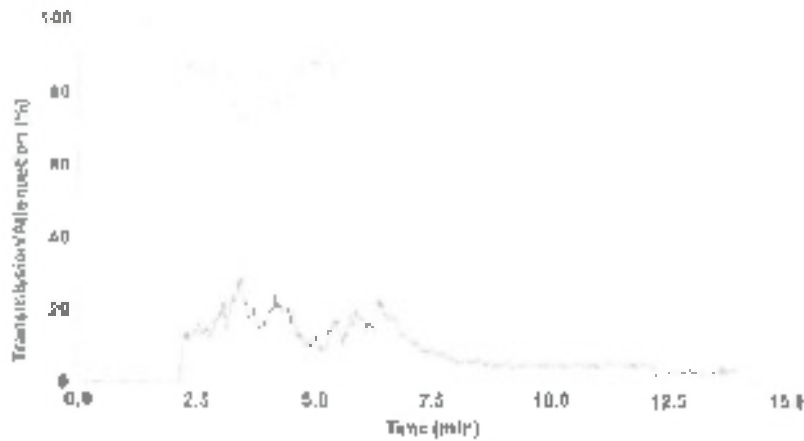
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Smoke Graph



Test name : g2 Class  
File name : D:\MR PHILIP S\16029371\_1\SV

**Flake Results**

Position (mm)	Time (s)	Flac (kg/m <sup>2</sup> )	Qsb (MJ/m <sup>2</sup> )	Residual (mm)	Time (s)	Flac (kg/m <sup>2</sup> )	Qsb (MJ/m <sup>2</sup> )
0	264	11.0	2.955	518	-	3.4	-
100	295	19.5	4.165	514	-	2.9	-
160	-	9.7	-	620	-	2.4	-
210	-	6.8	-	670	-	2.1	-
260	-	7.8	-	710	-	1.8	-
310	-	4.4	-	761	-	1.5	-
360	-	5.4	-	810	-	1.5	-
410	-	5.9	-	860	-	1.2	-
460	-	4.2	-	910	-	1.1	-

**Comments**

Specimen extinguished naturally.

This result is only valid for the delimiters of the specimens of the product under the particular conditions of the test. They are not intended to be a guide for the assessment of the overall fire hazard of the product in use.



## APPENDIX I: Flooring Radiant Panel Single Specimen Report

Report produced with the Fire Safety Reporting (FSR) software

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89208761

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### Flooring Radiant Panel Single Specimen Report

Standard	: EN ISO 9239-1:2016
Laboratory	: TÜV Rheinland Nederland B.V.
Sporenr	: Endesign Limited 89208761
Date of test	: Feb. 17 2016
Specimen description	: MFLOR Loose Lay MT16 60x26.02
Test name	: # 3 Prod
File name	: D:\3\3RPH\2016\1602170744\CSV
Test number in series	: 4
Flux calibration file name	: C:\SRM\SOFT29A\CALIBR\LN16002.CSV
Thickness (mm)	: 4.95
Density (kg/m <sup>3</sup> )	: 1713
Test duration	: 12 minutes 13 seconds (755 s)
Substrate used?	: Yes
Substrate	: Calcium silicate
Fixing method	: None (loose laid)
Conditioned?	: Yes
Conditioning temp. (°C)	: 23
Conditioning RH (%)	: 58

#### Test Results

Time to ignition	: 2 minutes 09 seconds (129 s)
Time to flameout	: 13 minutes 12 seconds (792 s)
Extent of burning (cm)	: 140
Critical flux at extinguishment (kW/m <sup>2</sup> )	: 10.53
HF-10 (kW/m <sup>2</sup> )	: 10.39
HF-20 (kW/m <sup>2</sup> )	: Not calculated (test duration < 30 minutes)
HF-30 (kW/m <sup>2</sup> )	: Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm)	: 170
Flame spread at 20 minutes (mm)	: Not measured
Flame spread at 30 minutes (mm)	: Not measured
Peak light attenuation (%)	: 31.58
Time to peak light attenuation	: 3 minutes 28 seconds (208 s)
Total integrated smoke (%/min)	: 99.82
Potential classification	: A2(1)0/B(0)
Smoke production classification	: s1

These results are only a description of the behaviour of the specimen of the product under the particular conditions of the test. They do not constitute a guarantee for the performance of the product in other conditions or for the overall fire behaviour of the product in use.

## APPENDIX I: Flooring Radiant Panel Single Specimen Report

Report produced with the Fire Engineering Reporting (FER) software

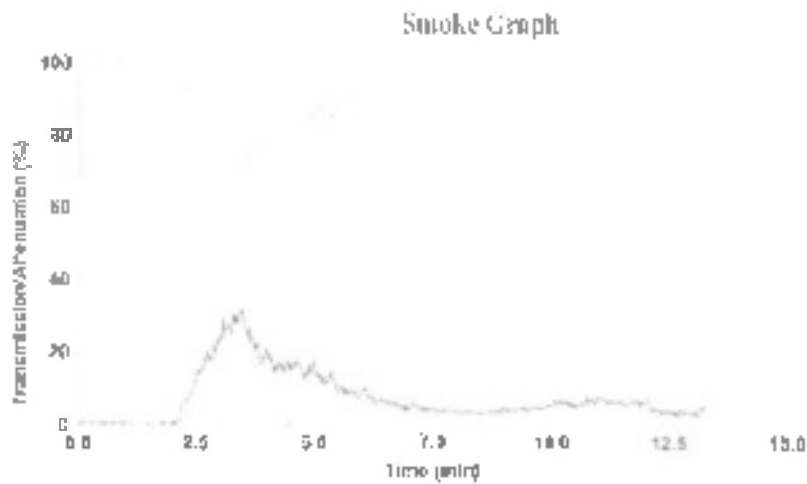
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03/03/2016

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69208701

Report number  
69208701.06br

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Test name : F3 Test

File name : D:\FRMPFILES\6920074.CSV

### Rake Results

Position (mm)	Time (s)	Flux (kW/m²)	Qst (MJ/m²)	Distance (mm)	Time (s)	Flux (kW/m²)	Qst (MJ/m²)
60	215	11.5	2474	10	-	3.1	-
100	120	10.5	1579	100	-	2.9	-
160	-	9.7	-	170	-	2.4	-
200	-	8.8	-	240	-	2.1	-
260	-	7.8	-	300	-	1.8	-
300	-	6.8	-	360	-	1.5	-
360	-	5.9	-	420	-	1.3	-
400	-	5.0	-	480	-	1.2	-
460	-	4.2	-	540	-	1.1	-

### Comments

Specimen extinguished naturally.

This result only valid to the left-hand of the specimen. If the product show the horizontal condition of the test they are not intended to be the same situation by moving the position fireward of the product to use.

## APPENDIX I: Flooring Radiant Panel Single Specimen Report

Report produced in accordance with the Testing Technology ERP4666-01-01

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05/03/2018

**Project number**  
8920878\*

**Report number**  
8920878-0361\*

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## Flooring Radiant Panel Single Specimen Report

Standard	: EN ISO 9239-1:2010
Laboratory	: TÜV Rheinland Neckarland B.V.
Spanner	: Endesign Limited 8920878*
Date of test	: Feb. 17 2018
Specimen description	: MFlot Loose Lay MT16-80026 03
Test name	: F 4 Prod
File name	: Dev REP L&S 16520075.CSV
Test number (1 series)	: 4
File substitution file name	: C:\REP\07129A\CALIB\F1LX16902.CSV
Thickness (mm)	: 4.95
Density (kg/m <sup>3</sup> )	: 1713
Test duration	: 21 minutes 56 seconds (1314 s)
Substrate used?	: Yes
Substrate	: Calcium silicate
Fixing method	: None (loose laid)
Conditioned?	: Yes
Conditioning temp. (°C)	: 23
Conditioning RH (%)	: 50

### Test Results

Time to ignition	: 2 minutes 04 seconds (124 s)
Time to blowout	: 21 minutes 51 seconds (1311 s)
Extent of burning (mm)	: 20
Critical flux at extinguishment (kW/m <sup>2</sup> )	: 8.82
HF-10 (kJ/m <sup>2</sup> )	: 39.33
HF-20 (kJ/m <sup>2</sup> )	: 8.62
HF-30 (kJ/m <sup>2</sup> )	: Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm)	: 20
Flame spread at 20 minutes (mm)	: 20
Flame spread at 30 minutes (mm)	: Not measured
Peak light attenuation (%)	: 25.45
Time to peak light attenuation	: 16 minutes 17 seconds (977 s)
Total integrated smoke (%.min)	: 198.34
Potential classification	: A2(1B)-B(1)
Smoke production classification	: s1

These results apply only to the laboratory test specimens of the product under the particular conditions of the test. They do not intend to be a guide for use in assessing the potential fire hazard of the product in use.

**APPENDIX I: Flooring Radiant Panel Single Specimen Report**

Report created with the Testing Software: MPEtest software

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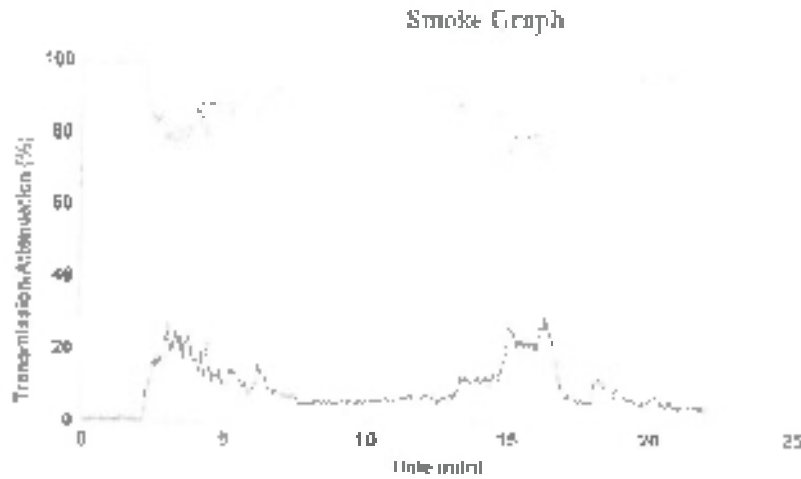
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Test name : #4-Frak  
File name : D:\PR\PTR-BS\16020473\_C8V

**Raise Results**

Position (mm)	Time (s)	Flux (W/m²)	Q <sub>RA</sub> (MJ/m²)	Position (mm)	Time (s)	Flux (W/m²)	Q <sub>RA</sub> (MJ/m²)
80	734	11.2	2.681	510	-	2.1	-
110	592	10.4	2.146	500	-	2.9	-
160	344	9.7	3.217	510	-	2.4	-
210	860	8.8	9.270	440	-	2.1	-
260	-	7.8	-	310	-	1.6	-
310	-	6.8	-	160	-	1.5	-
360	-	5.9	-	810	-	1.3	-
410	-	5.0	-	660	-	1.2	-
460	-	4.1	-	510	-	1.1	-

Comments

Specimen extinguished naturally

This report is only valid in the context of the performance of the product under the particular conditions of the test. Any use not intended by the manufacturer for any other purpose is the liability of the customer.