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**Report**

Project number : 89202643  
Report number : 89202643.02br

**Date**  
14 December, 2012

**Received:**

A sample of floor covering, entrance mat, marked as: **“Coral Brush FR”**;  
TÜV sample reference: MT12-36545.02.

**Project number**  
89202643

**Report number**  
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**Request:**

Classification of burning behaviour according to EN 13501-1:2007.

**Phone number client**  
+31 75 627 3273

**Test method:**

Identification parameters : EN 1307.  
Ignitability (direct impingement of flame) : EN ISO 11925-2.  
Reaction to fire (radiant panel) : EN ISO 9239-1.

**Fax number client**  
+31 75 627 3274

**Results:**

See page two up to and including three.

**Article**  
Coral Brush FR

**Appendix:**

See page four up to and including eleven.

**Appendix**  
I : Flooring Radiant Panel Single  
Specimen Report – 8 pages

**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.

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**TEST RESULTS**
**Date**  
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 ➤ *Identification parameters EN 1307:2008*

Type of manufacture : Tufted  
 Type of pile : Cut pile  
 Type of use surface : Tonal effect  
 Type of secondary backing : Latex backing (synthetic)\*  
 Pile Fibre : 100% PA\*  
 Total mass per unit area g/m<sup>2</sup> : 3549  
 Effective pile mass, g/m<sup>2</sup> : 658  
 Total thickness, mm : 8.9  
 Thickness of the pile, mm : 5.6  
 Pile density, g/cm<sup>3</sup> : 0.118  
 Gauge (G), inch : 5/32  
 Stitches/10 cm : 23.0  
 Number of tufts/m<sup>2</sup> : 57,960

\* = manufacturer's declaration

 ➤ *Ignitability EN-ISO 11925-2:2010*

Conditioning time, climate : 6 days, 23 ± 2 °C and 50 ± 5 %  
 Date of testing : 29-10-2012  
 Description of substrate : 6 mm. Fibre cement board, 1800 kg/m<sup>3</sup>.  
 Flame application : Surface.  
 Application time : 15 seconds.

| Direction:                             | In production |     |     | Across production |     |     |
|--|---------------|-----|-----|-------------------|-----|-----|
|  |               |     |     |                   |     |     |
| Total burning time <sup>1</sup> (15 s) | 15            | 15  | 15  | 15                | 15  | 15  |
| Flame tip reaches 150 mm (s)           | no            | no  | no  | no                | no  | no  |
| Extent of damaged area, length (mm)    | 90            | 90  | 90  | 80                | 80  | 80  |
| Extent of damaged area, width (mm)     | 13            | 13  | 12  | 13                | 13  | 13  |
| 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  |

1 Inclusive a flame application time of 15 or 30 seconds with surface or edge impingement

2 Shrinks away from flame without being ignited

3 The time at which it occurs and its duration

**TEST RESULTS – follow-up**
**Date**  
 14 December, 2012

 ➤ *Radiant Panel test ISO 9239-1:2010*
**Project number**  
 89202643

Date of testing : 29-10-2012 (1+2) and 05-11-2012 (3+4)  
 Conditioning time, climate : 4 days, 23 ± 2 °C and 50 ± 5 %  
 Description of substrate : Fibre cement board, 8±2 mm ,1800±200 kg/m<sup>3</sup>  
 conforming to EN 13238.  
 Sampling procedure : By contractor.  
 Description of cleaning used : None.  
 Fixing method : None, loose laid.

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| Test specimen, orientation | Flame spread (cm) | CRF (kW/m <sup>2</sup> ) | Peak light attenuation (%) | Smoke production (%.min) |
|----------------------------|-------------------|--------------------------|----------------------------|--------------------------|
| 1, ⊥                       | 6.0               | 10.8                     | 2.1                        | 9                        |
| 2, ↑                       | 6.0               | 10.7                     | 1.6                        | 4                        |
| 3, ↑                       | 8.0               | 10.4                     | 3.1                        | 14                       |
| 4, ↑*                      | 10.0              | 10.2                     | 3.2                        | 11                       |
| <b>Mean</b>                | <b>8.0</b>        | <b>10.4</b>              | <b>2.7</b>                 | <b>10</b>                |

Remarks: No flashing, transitory- or sustained flaming,  
 All specimen extinguished naturally

**CONCLUSION**

According to EN 13501-1:2007 the tested sample of the aforementioned quality  
**Coral Brush FR**, meets the requirements of **Class B<sub>fl</sub> - s1**.

**Author:**  
 Mrs. I. Pierik

**Review:**  
 Mr. R. Boerboom

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## APPENDIX I: Flooring Radiant Panel Single Specimen Report

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14 December, 2012

**Project number**  
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89202643.02br

## Flooring Radiant Panel Single Specimen Report

**Article**  
Coral Brush FR

**Standard** : EN ISO 9239-1:2002  
**Laboratory** : TÜV Rheinland Nederland B.V.  
**Sponsor** : Forbo - Coral Brush FR - 89202643 - ipk  
**Date of test** : Oct. 29 2012

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**Specimen description** : MT12-36545.02  
**Test name** : Across #1  
**File name** : D:\FRPFILES\12100043.CSV  
**Test number in series** : 4

**Flux calibration file name** : C:\FRPSOFT\CALIB\FIX12012.CSV

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

**Test duration** : 12 minutes 23 seconds (743 s)  
**Substrate used?** : Yes  
**Substrate** : Calcium silicate  
**Fixing method** : none  
**Conditioned?** : Yes  
**Conditioning temp. (°C)** : 23  
**Conditioning RH (%)** : 50

### Test Results

**Time to ignition** : 2 minutes 02 seconds (122 s)  
**Time to flameout** : 12 minutes 18 seconds (738 s)  
**Extent of burning (mm)** : 60  
**Critical flux at extinguishment (kW/m<sup>2</sup>)** : >= 10.9  
**HF-10 (kW/m<sup>2</sup>)** : 10.78  
**HF-20 (kW/m<sup>2</sup>)** : >= 10.9  
**HF-30 (kW/m<sup>2</sup>)** : >= 10.9  
**Flame spread at 10 minutes (mm)** : 50  
**Flame spread at 20 minutes (mm)** : -1  
**Flame spread at 30 minutes (mm)** : -1  
**Peak light attenuation (%)** : 2.08  
**Time to peak light attenuation** : 6 minutes 10 seconds (370 s)  
**Total integrated smoke (%.min)** : 8.7  
**Potential classification** : A2(0)/B(0)  
**Smoke production classification** : s1

These results relate only to the behaviour of the specimens 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.



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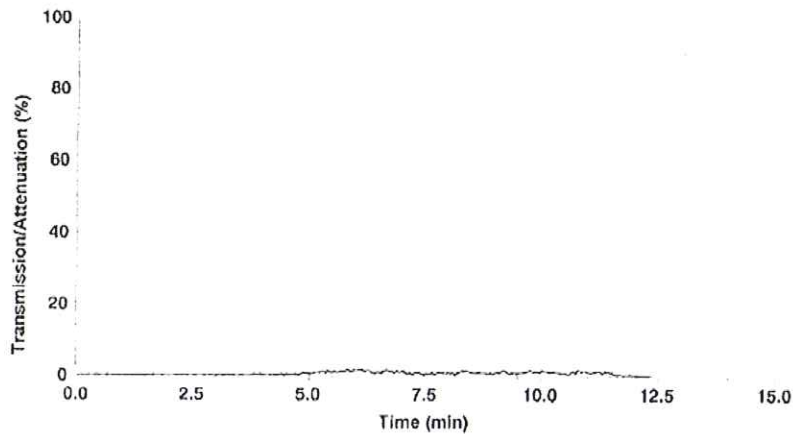
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### Smoke Graph



Test name : Across #1  
File name : D:\FRPFILES\12100043.CSV

### Rake Results

| Position (mm) | Time (s) | Flux (kW/m <sup>2</sup> ) | Qsb (MJ/m <sup>2</sup> ) | Position (mm) | Time (s) | Flux (kW/m <sup>2</sup> ) | Qsb (MJ/m <sup>2</sup> ) |
|---------------|----------|---------------------------|--------------------------|---------------|----------|---------------------------|--------------------------|
| 60            | 681      | 10.7                      | 6.836                    | 510           | -        | 3.6                       | -                        |
| 110           | -        | 10.0                      | -                        | 560           | -        | 3.0                       | -                        |
| 160           | -        | 9.5                       | -                        | 610           | -        | 2.5                       | -                        |
| 210           | -        | 8.9                       | -                        | 660           | -        | 2.1                       | -                        |
| 260           | -        | 7.9                       | -                        | 710           | -        | 1.8                       | -                        |
| 310           | -        | 6.9                       | -                        | 760           | -        | 1.6                       | -                        |
| 360           | -        | 6.0                       | -                        | 810           | -        | 1.4                       | -                        |
| 410           | -        | 5.1                       | -                        | 860           | -        | 1.3                       | -                        |
| 460           | -        | 4.2                       | -                        | 910           | -        | 1.2                       | -                        |

### Comments

Specimen extinguished naturally.

These results relate only to the behaviour of the specimens 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.

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**Flooring Radiant Panel Single Specimen Report**

**Standard** : EN ISO 9239-1:2002  
**Laboratory** : TÜV Rheinland Nederland B.V.  
**Sponsor** : Fotbo - Coral Brush FR - 89202643 - ipk  
**Date of test** : Oct. 29 2012

**Specimen description** : MT12-36545.02  
**Test name** : Prod #1  
**File name** : D:\FRPFILES\12100042.CSV  
**Test number in series** : 4

**Flux calibration file name** : C:\FRPSOFT\CALIB\FLX12012.CSV

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

**Test duration** : 12 minutes 41 seconds (761 s)  
**Substrate used?** : Yes  
**Substrate** : Calcium silicate  
**Fixing method** : none  
**Conditioned?** : Yes  
**Conditioning temp. (°C)** : 23  
**Conditioning RH (%)** : 50

**Test Results**

**Time to ignition** : 2 minutes 08 seconds (128 s)  
**Time to flameout** : 12 minutes 38 seconds (758 s)  
**Extent of burning (mm)** : 60  
**Critical flux at extinguishment (kW/m<sup>2</sup>)** : >= 10,9  
**HF-10 (kW/m<sup>2</sup>)** : 10,66  
**HF-20 (kW/m<sup>2</sup>)** : >= 10,9  
**HF-30 (kW/m<sup>2</sup>)** : >= 10,9  
**Flame spread at 10 minutes (mm)** : 60  
**Flame spread at 20 minutes (mm)** : -1  
**Flame spread at 30 minutes (mm)** : -1  
**Peak light attenuation (%)** : 1,57  
**Time to peak light attenuation** : 5 minutes 59 seconds (359 s)  
**Total integrated smoke (%.min)** : 4,46  
**Potential classification** : A2(H)/B(H)  
**Smoke production classification** : s1

These results relate only to the behaviour of the specimens 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.

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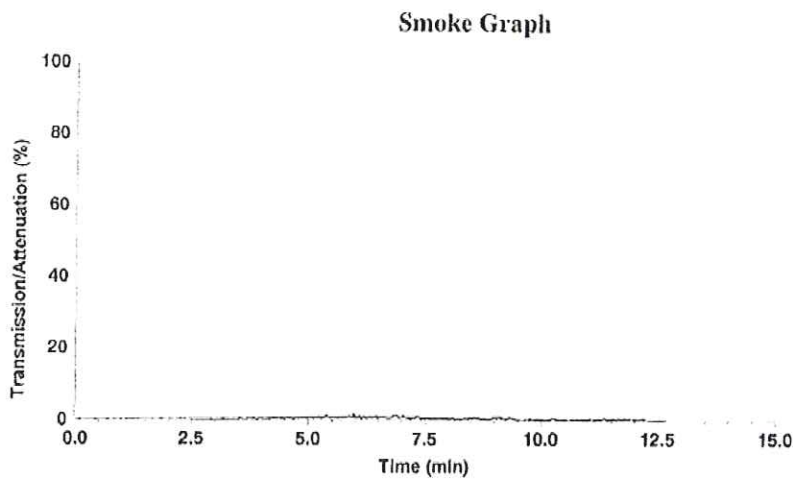
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Test name : Prod #1  
File name : D:\FRPFILES\12100042.CSV

### Rake Results

| Position (mm) | Time (s) | Flux (kW/m <sup>2</sup> ) | Qsb (MJ/m <sup>2</sup> ) | Position (mm) | Time (s) | Flux (kW/m <sup>2</sup> ) | Qsb (MJ/m <sup>2</sup> ) |
|---------------|----------|---------------------------|--------------------------|---------------|----------|---------------------------|--------------------------|
| 60            | 446      | 10.7                      | 4.477                    | 510           | -        | 3.6                       | -                        |
| 110           | -        | 10.0                      | -                        | 560           | -        | 3.0                       | -                        |
| 160           | -        | 9.5                       | -                        | 610           | -        | 2.5                       | -                        |
| 210           | -        | 8.9                       | -                        | 660           | -        | 2.1                       | -                        |
| 260           | -        | 7.9                       | -                        | 710           | -        | 1.8                       | -                        |
| 310           | -        | 6.9                       | -                        | 760           | -        | 1.6                       | -                        |
| 360           | -        | 6.0                       | -                        | 810           | -        | 1.4                       | -                        |
| 410           | -        | 5.1                       | -                        | 860           | -        | 1.3                       | -                        |
| 460           | -        | 4.2                       | -                        | 910           | -        | 1.2                       | -                        |

### Comments

Specimen extinguished naturally.

These results relate only to the behaviour of the specimens 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.

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### Flooring Radiant Panel Single Specimen Report

Article  
Coral Brush FR

Standard : EN ISO 9239-1:2002  
Laboratory : TÜV Rheinland Nederland B.V.  
Sponsor : Forbo - 89202643 - Coral Brush FR - IPK  
Date of test : Nov. 05 2012

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Specimen description : MT12-36545.02  
Test name : Prod #2  
File name : D:\FRPFILES\12110005.CSV  
Test number in series : 4

Flux calibration file name : C:\FRPSOFT\CALIB\FLX12012.CSV

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

Test duration : 13 minutes 01 seconds (781 s)  
Substrate used? : Yes  
Substrate : Calcium silicate  
Fixing method : adhesive loose laid  
Conditioned? : Yes  
Conditioning temp. (°C) : 23  
Conditioning RH (%) : 50

#### Test Results

Time to ignition : 2 minutes 18 seconds (138 s)  
Time to flameout : 12 minutes 59 seconds (779 s)  
Extent of burning (mm) : 80  
Critical flux at extinguishment (kW/m<sup>2</sup>) : >= 10.9  
HF-10 (kW/m<sup>2</sup>) : 10.41  
HF-20 (kW/m<sup>2</sup>) : >= 10.9  
HF-30 (kW/m<sup>2</sup>) : >= 10.9  
Flame spread at 10 minutes (mm) : 80  
Flame spread at 20 minutes (mm) : -1  
Flame spread at 30 minutes (mm) : -1  
Peak light attenuation (%) : 3.14  
Time to peak light attenuation : 10 minutes 24 seconds (624 s)  
Total integrated smoke (%.min) : 13.93  
Potential classification : A2(l)/B(l)  
Smoke production classification : s1

These results relate only to the behaviour of the specimens 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.



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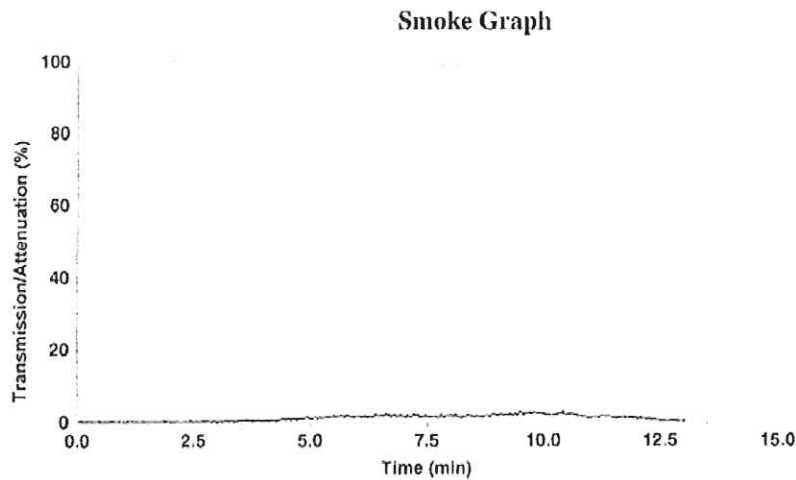
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Test name : Prod #2  
 File name : D:\FRPFILES\12110005.CSV

### Rake Results

| Position (mm) | Time (s) | Flux (kW/m <sup>2</sup> ) | Qsb (MJ/m <sup>2</sup> ) | Position (mm) | Time (s) | Flux (kW/m <sup>2</sup> ) | Qsb (MJ/m <sup>2</sup> ) |
|---------------|----------|---------------------------|--------------------------|---------------|----------|---------------------------|--------------------------|
| 60            | 335      | 10.7                      | 3.363                    | 510           | -        | 3.6                       | -                        |
| 110           | -        | 10.0                      | -                        | 560           | -        | 3.0                       | -                        |
| 160           | -        | 9.5                       | -                        | 610           | -        | 2.5                       | -                        |
| 210           | -        | 8.9                       | -                        | 660           | -        | 2.1                       | -                        |
| 260           | -        | 7.9                       | -                        | 710           | -        | 1.8                       | -                        |
| 310           | -        | 6.9                       | -                        | 760           | -        | 1.6                       | -                        |
| 360           | -        | 6.0                       | -                        | 810           | -        | 1.4                       | -                        |
| 410           | -        | 5.1                       | -                        | 860           | -        | 1.3                       | -                        |
| 460           | -        | 4.2                       | -                        | 910           | -        | 1.2                       | -                        |

### Comments

Specimen extinguished naturally.

These results relate only to the behaviour of the specimens 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.

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### Flooring Radiant Panel Single Specimen Report

Standard : EN ISO 9239-1:2002  
Laboratory : TÜV Rheinland Nederland B.V.  
Sponsor : Forbo - 89202643 - Coral Brush FR - IPK  
Date of test : Nov. 05 2012

Specimen description : MT12-36545.02  
Test name : Prod #3  
File name : D:\FRPFILES\12110006.CSV  
Test number in series : 4

Flux calibration file name : C:\FRPSOFT\CALIB\FLX12012.CSV

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

Test duration : 12 minutes 46 seconds (766 s)  
Substrate used? : Yes  
Substrate : Calcium silicate  
Fixing method : none  
Conditioned? : Yes  
Conditioning temp. (°C) : 23  
Conditioning RH (%) : 50

#### Test Results

Time to ignition : 2 minutes 02 seconds (122 s)  
Time to flameout : 12 minutes 41 seconds (761 s)  
Extent of burning (mm) : 100  
Critical flux at extinguishment (kW/m<sup>2</sup>) : >= 10.9  
HF-10 (kW/m<sup>2</sup>) : 10.16  
HF-20 (kW/m<sup>2</sup>) : >= 10.9  
HF-30 (kW/m<sup>2</sup>) : >= 10.9  
Flame spread at 10 minutes (mm) : 100  
Flame spread at 20 minutes (mm) : -1  
Flame spread at 30 minutes (mm) : -1  
Peak light attenuation (%) : 3.24  
Time to peak light attenuation : 7 minutes 08 seconds (428 s)  
Total integrated smoke (%.min) : 11.17  
Potential classification : A2(II)/B(II)  
Smoke production classification : s1

These results relate only to the behaviour of the specimens 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.

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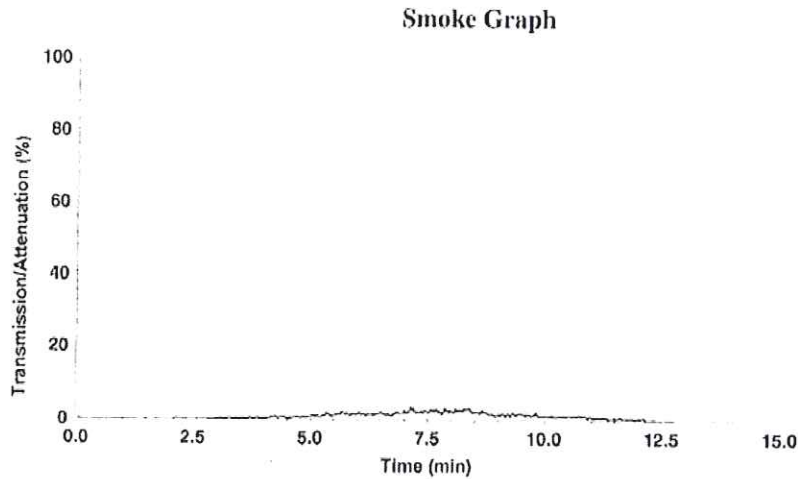
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Test name : Prod #3  
File name : D:\FRPFILES\12110006.CSV

### Rake Results

| Position (mm) | Time (s) | Flux (kW/m <sup>2</sup> ) | Qsb (MJ/m <sup>2</sup> ) | Position (mm) | Time (s) | Flux (kW/m <sup>2</sup> ) | Qsb (MJ/m <sup>2</sup> ) |
|---------------|----------|---------------------------|--------------------------|---------------|----------|---------------------------|--------------------------|
| 60            | 371      | 10.7                      | 3.724                    | 510           | -        | 3.6                       | -                        |
| 110           | -        | 10.0                      | -                        | 560           | -        | 3.0                       | -                        |
| 160           | -        | 9.5                       | -                        | 610           | -        | 2.5                       | -                        |
| 210           | -        | 8.9                       | -                        | 660           | -        | 2.1                       | -                        |
| 260           | -        | 7.9                       | -                        | 710           | -        | 1.8                       | -                        |
| 310           | -        | 6.9                       | -                        | 760           | -        | 1.6                       | -                        |
| 360           | -        | 6.0                       | -                        | 810           | -        | 1.4                       | -                        |
| 410           | -        | 5.1                       | -                        | 860           | -        | 1.3                       | -                        |
| 460           | -        | 4.2                       | -                        | 910           | -        | 1.2                       | -                        |

### Comments

Specimen extinguished naturally.

These results relate only to the behaviour of the specimens 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.