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Date
11 January, 2013

Project number
89202921

Report number
89202921.09br

Phone number client
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Article
Marmoleum Sport 3.2

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

Report

Project number : 89202921
Report number : 89202921.09br

Received:
A sample of resilient floor covering, linoleum marked as:
"Marmoleum Sport 3.2"; TÜV sample reference: MT12-36743.09.

Product information received from the applicant:
Total thickness : 3.20 mm

Sampling Procedure:
The sample have all been prepared, cut out and fixed with Eurocol Eurostar Lino Plus 614 on a wooden fibre board. The test house has had no influence on the sampling.

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

Test method:
Reaction to fire (radiant panel) : EN ISO 9239-1.

Ignitability (direct impingement of flame) according to EN ISO 11925-2 has not been performed; According to EN 14041:2004, table 3 decorative and plain linoleum with following identification parameter:-

- Minimum mass (kg/m^2) of 2.3
- Maximum mass (kg/m^2) of 4.9 and an
- Overall thickness of minimal 2.0,

shall receive a E_{fl} classification without-further-testing (CWFT).

Results:
See page two.

Appendix:
See page three up to and including ten.

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Article
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TEST RESULTS

➢ *Radiant Panel test ISO 9239-1:2010*

Date of testing	: 19-12-2012
Conditioning time, climate	: 5 days, 23 ± 2 °C and 50 ± 5 %
Description of substrate	: Wooden fibre board, conforming to EN 13238.
Sampling procedure	: By contractor.
Description of cleaning used	: None.
Fixing method	: Fixed by contractor with Eurocol Eurostar Lino Plus 614

Test specimen, orientation	Flame spread (cm)	CRF (kW/m^2)	Peak light attenuation (%)	Smoke production (%.min)
1, ⊥	34.0	6.5	33.0	273
*2, ↑	38.0	5.7	41.6	315
3, ↑	32.0	6.9	29.0	295
4, ↑	34.0	6.5	36.5	323
$Mean_{2-4}$	**34.7**	**6.3**	**35.7**	**311**

Remarks: No flashing, transitory- or sustained flaming observed.
* the tested specimen extinguished naturally.

CONCLUSION

According to EN 13501-1:2007 the tested sample of the aforementioned quality **Marmoleum Sport 3.2** meets the requirements of **Class C_{fl} - s1**.

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 five years after its issue or 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.

Author:
Mrs. I. Pierik

Review:
Mr. J. Brinks

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APPENDIX I: Flooring Radiant Panel Single Specimen Report

Date
11 January, 2013

Project number
89202921

Report number
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Flooring Radiant Panel Single Specimen Report

Article
Marmoleum Sport 3.2

Standard	: EN ISO 9239-1:2002
Laboratory	: TÜV Rheinland Nederland B.V.
Sponsor	: Forbo Flooring - Sport 3.2 - 89202921 - IPK
Date of test	: Dec. 19 2012
Specimen description	: MT12-36743.09
Test name	: Across #1
File name	: D:\FRPFILES\12120031.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT\CALIB\FLX12013.CSV
Thickness (mm)	: 3.2
Density (kg/m³)	:
Test duration	: 30 minutes (1800 s)
Substrate used?	: Yes
Substrate	: Wooden board
Fixing method	: adhesive
Conditioned?	: Yes
Conditioning temp. (°C)	: 23
Conditioning RH (%)	: 50

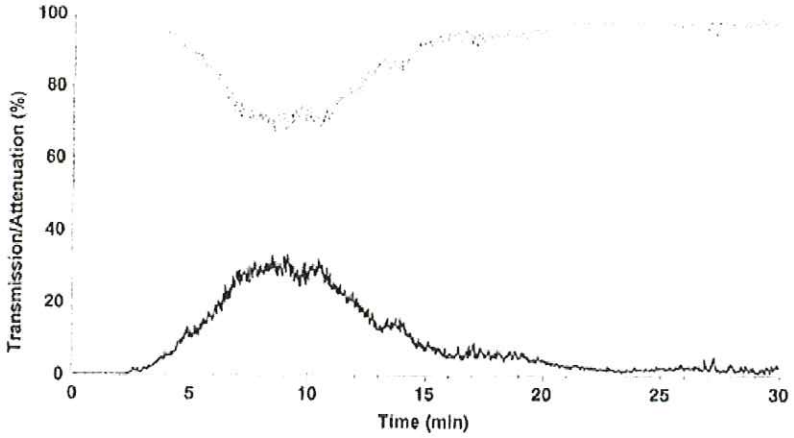
Test Results

Time to ignition	: 2 minutes 03 seconds (123 s)
Time to flameout	: Not recorded
Extent of burning (mm)	: 340
Critical flux at extinguishment (kW/m²)	: N/A (no flameout)
HF-10 (kW/m²)	: 8.84
HF-20 (kW/m²)	: 6.96
HF-30 (kW/m²)	: 6.45
Flame spread at 10 minutes (mm)	: 220
Flame spread at 20 minutes (mm)	: 315
Flame spread at 30 minutes (mm)	: 340
Peak light attenuation (%)	: 33.01
Time to peak light attenuation	: 9 minutes 06 seconds (546 s)
Total integrated smoke (%.min)	: 273.02
Potential classification	**: C(fl)**
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.

APPENDIX I: Flooring Radiant Panel Single Specimen Report

Smoke Graph



Test name : Across #1
File name : D:\FRPFILES\12120031.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)	Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)
60	254	11.2	2.651	510	-	3.6	-
110	350	10.4	3.430	560	-	3.0	-
160	422	9.8	3.816	610	-	2.5	-
210	589	9.0	4.724	660	-	2.1	-
260	794	8.0	5.604	710	-	1.8	-
310	1138	7.1	6.875	760	-	1.5	-
360	-	6.0	-	810	-	1.3	-
410	-	5.1	-	860	-	1.2	-
460	-	4.3	-	910	-	1.1	-

Comments

Specimen was extinguished manually after end of test.

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Date
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Article
Marmoleum Sport 3.2

Flooring Radiant Panel Single Specimen Report

Standard	: EN ISO 9239-1:2002
Laboratory	: TÜV Rheinland Nederland B.V.
Sponsor	: Forbo Flooring - Sport 3.2 - 89202921 - IPK
Date of test	: Dec. 19 2012
Specimen description	: MT12-36743.09
Test name	: Prod #1
File name	: D:\FRPFILES\12120030.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT\CALIB\FLX12013.CSV
Thickness (mm)	: 3.2
Density (kg/m³)	:
Test duration	: 29 minutes 39 seconds (1779 s)
Substrate used?	: Yes
Substrate	: Wooden board
Fixing method	: adhesive
Conditioned?	: Yes
Conditioning temp. (°C)	: 23
Conditioning RH (%)	: 50

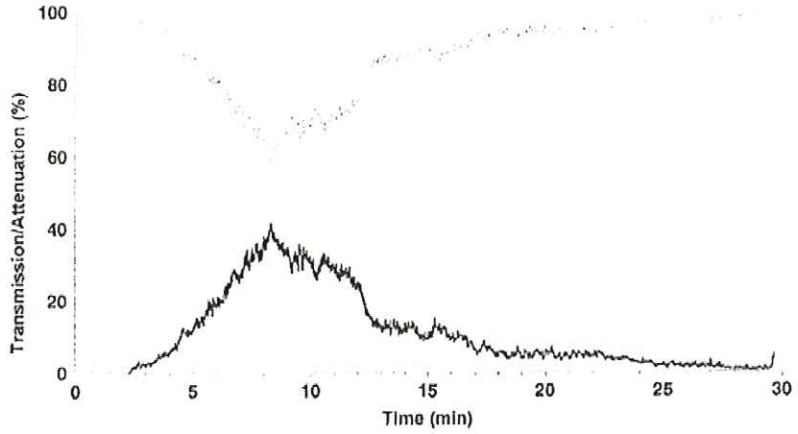
Test Results

Time to ignition	: 2 minutes 04 seconds (124 s)
Time to flameout	: 29 minutes 37 seconds (1777 s)
Extent of burning (mm)	: 380
Critical flux at extinguishment (kW/m²)	: 5.67
HF-10 (kW/m²)	: 8.63
HF-20 (kW/m²)	: 6.65
HF-30 (kW/m²)	: >= 10.9
Flame spread at 10 minutes (mm)	: 230
Flame spread at 20 minutes (mm)	: 330
Flame spread at 30 minutes (mm)	: -1
Peak light attenuation (%)	: 41.56
Time to peak light attenuation	: 8 minutes 18 seconds (498 s)
Total integrated smoke (%.min)	: 315.1
Potential classification	**: C(fl)**
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.

APPENDIX I: Flooring Radiant Panel Single Specimen Report

Smoke Graph



Test name : Prod #1
File name : D:\FRPFILES\12120030.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)	Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)
60	232	11.2	2.422	510	-	3.6	-
110	316	10.4	3.097	560	-	3.0	-
160	416	9.8	3.761	610	-	2.5	-
210	561	9.0	4.499	660	-	2.1	-
260	634	8.0	4.475	710	-	1.8	-
310	1000	7.1	6.041	760	-	1.5	-
360	1308	6.0	6.677	810	-	1.3	-
410	-	5.1	-	860	-	1.2	-
460	-	4.3	-	910	-	1.1	-

Comments

Specimen extinguished naturally.

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Article
Marmoleum Sport 3.2

Flooring Radiant Panel Single Specimen Report

Standard	: EN ISO 9239-1:2002
Laboratory	: TÜV Rheinland Nederland B.V.
Sponsor	: Forbo Flooring - Sport 3.2 - 89202921 - IPK
Date of test	: Dec. 19 2012
Specimen description	: MT12-36743.09
Test name	: Prod #2
File name	: D:\FRPFILES\12120032.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT\CALIB\FLX12013.CSV
Thickness (mm)	: 3.2
Density (kg/m³)	:
Test duration	: 30 minutes (1800 s)
Substrate used?	: Yes
Substrate	: Wooden board
Fixing method	: adhesive
Conditioned?	: Yes
Conditioning temp. (°C)	: 23
Conditioning RH (%)	: 50

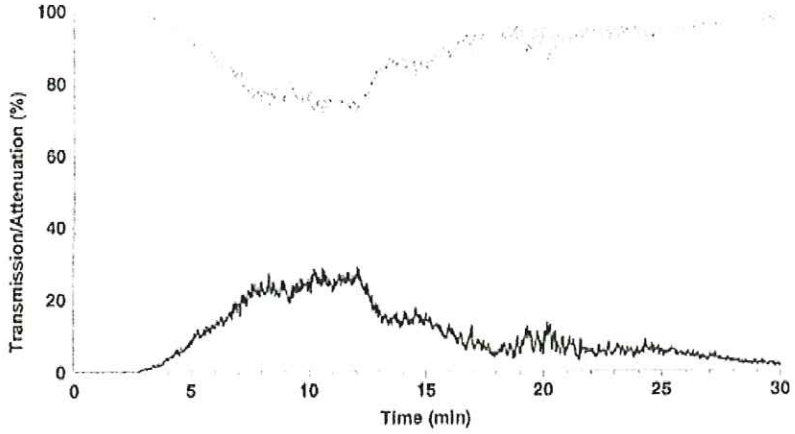
Test Results

Time to ignition	: 3 minutes 44 seconds (224 s)
Time to flameout	: Not recorded
Extent of burning (mm)	: 320
Critical flux at extinguishment (kW/m²)	: N/A (no flameout)
HF-10 (kW/m²)	: 9.5
HF-20 (kW/m²)	: 7.25
HF-30 (kW/m²)	: 6.85
Flame spread at 10 minutes (mm)	: 180
Flame spread at 20 minutes (mm)	: 300
Flame spread at 30 minutes (mm)	: 320
Peak light attenuation (%)	: 29.04
Time to peak light attenuation	: 12 minutes 02 seconds (722 s)
Total integrated smoke (%.min)	: 294.71
Potential classification	**: C(fl)**
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.

APPENDIX I: Flooring Radiant Panel Single Specimen Report

Smoke Graph



Test name : Prod #2
File name : D:\FRPFILES\12120032.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)	Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)
60	254	11.2	2.651	510	-	3.6	-
110	360	10.4	3.528	560	-	3.0	-
160	526	9.8	4.756	610	-	2.5	-
210	698	9.0	5.598	660	-	2.1	-
260	946	8.0	6.677	710	-	1.8	-
310	1595	7.1	9.635	760	-	1.5	-
360	-	6.0	-	810	-	1.3	-
410	-	5.1	-	860	-	1.2	-
460	-	4.3	-	910	-	1.1	-

Comments

Specimen was extinguished manually after end of test.

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Date
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89202921

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Article
Marmoleum Sport 3.2

Flooring Radiant Panel Single Specimen Report

Standard	: EN ISO 9239-1:2002
Laboratory	: TÜV Rheinland Nederland B.V.
Sponsor	: Forbo Flooring - Sport 3.2 - 89202921 - IPK
Date of test	: Dec. 19 2012
Specimen description	: MT12-36743.09
Test name	: Prod #3
File name	: D:\FRPFILES\12120033.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT\CALIB\FLX12013.CSV
Thickness (mm)	:
Density (kg/m³)	:
Test duration	: 30 minutes (1800 s)
Substrate used?	: Yes
Substrate	: Wooden board
Fixing method	: adhesive
Conditioned?	: Yes
Conditioning temp. (°C)	: 23
Conditioning RH (%)	: 50

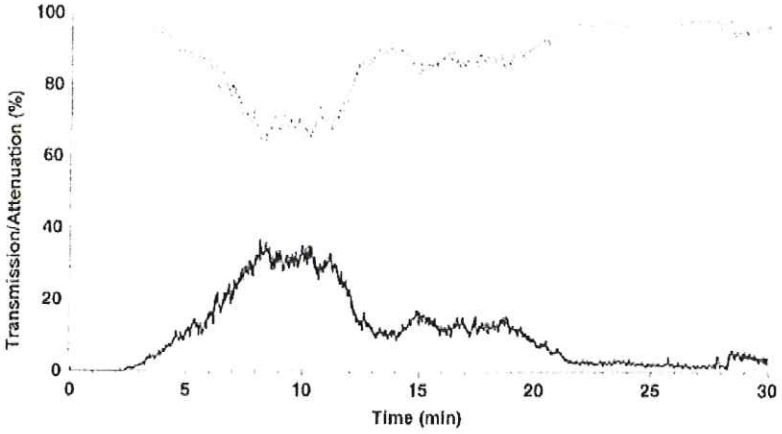
Test Results

Time to ignition	: 2 minutes 02 seconds (122 s)
Time to flameout	: Not recorded
Extent of burning (mm)	: 340
Critical flux at extinguishment (kW/m²)	: N/A (no flameout)
HF-10 (kW/m²)	: 9.04
HF-20 (kW/m²)	: 6.85
HF-30 (kW/m²)	: 6.45
Flame spread at 10 minutes (mm)	: 210
Flame spread at 20 minutes (mm)	: 320
Flame spread at 30 minutes (mm)	: 340
Peak light attenuation (%)	: 36.48
Time to peak light attenuation	: 8 minutes 08 seconds (488 s)
Total integrated smoke (%.min)	: 322.91
Potential classification	**: C(fl)**
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.

APPENDIX I: Flooring Radiant Panel Single Specimen Report

Smoke Graph



Test name : Prod #3
File name : D:\FRPFILES\12120033.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)	Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)
60	241	11.2	2.516	510	-	3.6	-
110	361	10.4	3.538	560	-	3.0	-
160	514	9.8	4.648	610	-	2.5	-
210	598	9.0	4.796	660	-	2.1	-
260	818	8.0	5.773	710	-	1.8	-
310	1088	7.1	6.573	760	-	1.5	-
360	-	6.0	-	810	-	1.3	-
410	-	5.1	-	860	-	1.2	-
460	-	4.3	-	910	-	1.1	-

Comments

Specimen was extinguished manually after end of test.