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Forbo Flooring Coral N.V.  
Att.: Mr. R. Koomen  
P.O. Box 17  
1560 AA  
KROMMENIE  
The Netherlands

### **Report**

Project number : 89201754  
Report number : 89201754.01br

### **Received:**

A sample, entrance flooring system, marked as: **“Nuway Connect – Textile inserts”**  
TÜV sample reference: MT12-35542.01.

### **Request:**

Classification of burning behaviour according to EN 13501-1:2007.  
Without performing the follow test: ignitability (direct impingement of flame)  
according to EN ISO 11925-2, minimum class is Efl.

### **Test method:**

Reaction to fire (radiant panel) : EN ISO 9239-1:2010.

### **Results:**

See page two.

### **Appendix:**

See page four up to and including ten.

TÜV Rheinland Nederland B.V.  
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**Date**  
14<sup>th</sup> of May, 2012

**Project number**  
89201754

**Report number**  
89201754.01br

**Phone number client**  
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**Article**  
Nuway Connect – Textile insert

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

TRN applies General Terms & Conditions  
which are filed at the office of the Clerk for  
civil affairs at the Court in Zutphen (the  
Netherlands) under number 35/2010,  
dated November 17th 2010.

## TEST RESULTS

**Date**  
14<sup>th</sup> of May, 2012

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

**Project number**  
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Date of testing : 07 and 08-05-2012  
 Conditioning time, climate : 7 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.

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Sampling procedure : By contractor.  
 Description of cleaning used : None.  
 Fixing method : Loose laid.

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Sample ID of client	Test specimen, orientation	Flame spread (cm)	CRF (kW/m <sup>2</sup> )	Peak light attenuation (%)	Smoke production (%.min)
4730_CMD-D	*1, ⊥	6.0	≥10.9	41.5	161
4730_MD_A	*2, ↑	21.0	9.4	45.2	290
4730_MD_C	*3, ↑	22.0	9.2	38.1	267
4730_MD_B	*4, ↑	23.0	8.9	39.6	292
	<b>Mean</b>	<b>22.0</b>	<b>9.2</b>	<b>41.0</b>	<b>283</b>

Remarks: no flashing, transitory- or sustained flaming,  
 \* specimen extinguished naturally

## CONCLUSION

According to EN 13501-1:2007 the tested sample of the aforementioned quality, entrance flooring system, **Nuway Connect with textile insert** meets the requirements of **Class B<sub>fl</sub> - 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. H. Fokkenrood

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## APPENDIX I: Flooring Radiant Panel Single Specimen Report

**Date**  
14<sup>th</sup> of May, 2012

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### Flooring Radiant Panel Single Specimen Report

**Article**  
Nuway Connect – Textile insert

Standard : EN ISO 9239-1:2002  
Laboratory : TÜV Rheinland Nederland B.V.  
Sponsor : Forbo CORAL - 89201754 - Nuway Connect with textile insert - ipk  
Date of test : May 07 2012

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Specimen description : MT12-35542.01  
Test name : Across #1  
File name : D:\FRPFILES\12050015.CSV  
Test number in series : 4

Flux calibration file name : C:\FRPSOFT\CALIB\FLX12006.CSV

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

Test duration : 14 minutes 52 seconds (892 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 : 14 minutes 49 seconds (889 s)  
Extent of burning (mm) : 60  
Critical flux at extinguishment (kW/m<sup>2</sup>) : >= 10.9  
HF-10 (kW/m<sup>2</sup>) : >= 10.9  
HF-20 (kW/m<sup>2</sup>) : >= 10.9  
HF-30 (kW/m<sup>2</sup>) : >= 10.9  
Flame spread at 10 minutes (mm) : 30  
Flame spread at 20 minutes (mm) : -1  
Flame spread at 30 minutes (mm) : -1  
Peak light attenuation (%) : 41.51  
Time to peak light attenuation : 6 minutes 56 seconds (416 s)  
Total integrated smoke (%.min) : 160.65  
**Potential classification** : **A2(f1)/B(f1)**  
**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

**Date**  
14<sup>th</sup> of May, 2012

**Project number**  
89201754

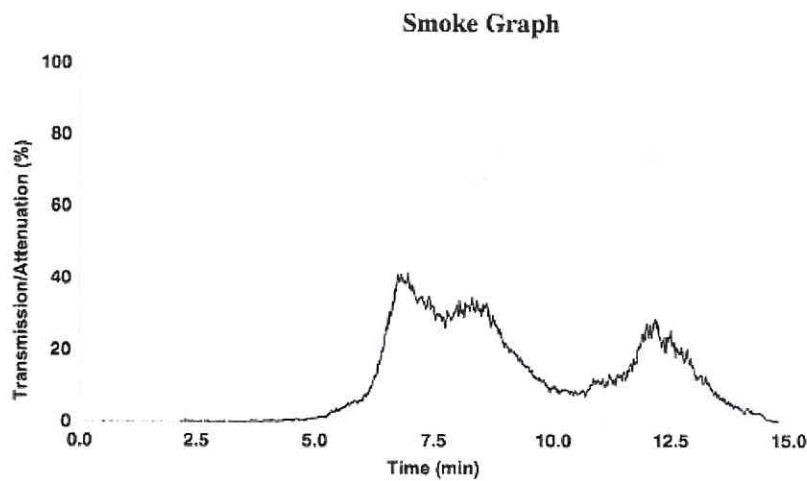
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Nuway Connect – Textile insert

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Test name : Across #1  
File name : D:\FRPFILES\12050015.CSV

### Rake Results

Position (mm)	Time (s)	Flux (kW/m <sup>2</sup> )	Qsh (MJ/m <sup>2</sup> )	Position (mm)	Time (s)	Flux (kW/m <sup>2</sup> )	Qsh (MJ/m <sup>2</sup> )
60	659	11.5	7.086	510	-	3.7	-
110	-	10.8	-	560	-	3.0	-
160	-	10.1	-	610	-	2.5	-
210	-	9.4	-	660	-	2.2	-
260	-	8.3	-	710	-	1.8	-
310	-	7.2	-	760	-	1.6	-
360	-	6.2	-	810	-	1.4	-
410	-	5.3	-	860	-	1.2	-
460	-	4.4	-	910	-	1.1	-

### 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 CORAL - 89201754 - Nuway Connect with textile insert - ipk  
Date of test : May 07 2012

Specimen description : MT12-35542.01  
Test name : Prod #1  
File name : D:\FRPFILES\12050016.CSV  
Test number in series : 4

Flux calibration file name : C:\FRPSOFT\CALIB\FLX12006.CSV

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

Test duration : 21 minutes 10 seconds (1270 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 03 seconds (123 s)  
Time to flameout : 21 minutes 08 seconds (1268 s)  
Extent of burning (mm) : 210  
Critical flux at extinguishment (kW/m<sup>2</sup>) : 9.37  
HF-10 (kW/m<sup>2</sup>) : 10.75  
HF-20 (kW/m<sup>2</sup>) : 9.37  
HF-30 (kW/m<sup>2</sup>) : >= 10.9  
Flame spread at 10 minutes (mm) : 110  
Flame spread at 20 minutes (mm) : 210  
Flame spread at 30 minutes (mm) : -1  
Peak light attenuation (%) : 45.22  
Time to peak light attenuation : 12 minutes 01 seconds (721 s)  
Total integrated smoke (%.min) : 289.68  
**Potential classification** : **A2(1)/B(1)**  
**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

**Date**  
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89201754

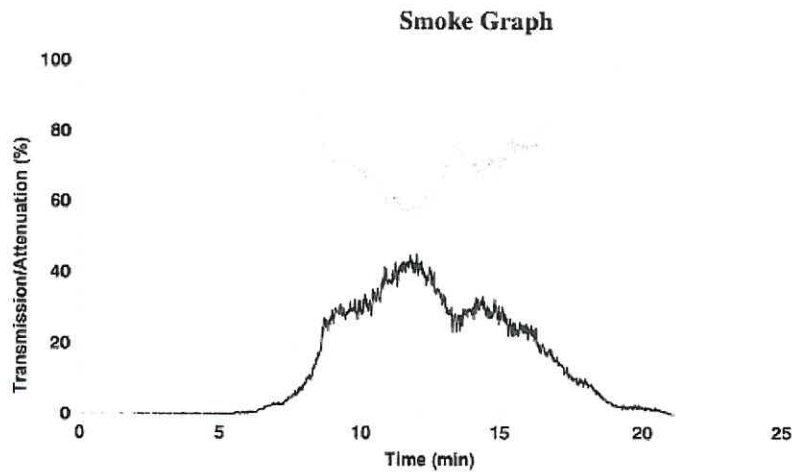
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Test name : Prod #1  
File name : D:\FRPFILES\12050016.CSV

### 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	409	11.5	4.398	510	-	3.7	-
110	607	10.8	6.143	560	-	3.0	-
160	781	10.1	7.318	610	-	2.5	-
210	964	9.4	7.981	660	-	2.2	-
260	-	8.3	-	710	-	1.8	-
310	-	7.2	-	760	-	1.6	-
360	-	6.2	-	810	-	1.4	-
410	-	5.3	-	860	-	1.2	-
460	-	4.4	-	910	-	1.1	-

### 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 CORAL - 89201754 - Nuway Connect with textile insert - ipk  
Date of test : May 07 2012

Specimen description : MT12-35542.01  
Test name : Prod #2  
File name : D:\FRPFILES\12050017.CSV  
Test number in series : 4

Flux calibration file name : C:\FRPSOFT\CALIB\FLX12006.CSV

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

Test duration : 24 minutes 12 seconds (1452 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 15 seconds (135 s)  
Time to flameout : 24 minutes 04 seconds (1444 s)  
Extent of burning (mm) : 220  
Critical flux at extinguishment (kW/m<sup>2</sup>) : 9.15  
HF-10 (kW/m<sup>2</sup>) : 10.75  
HF-20 (kW/m<sup>2</sup>) : 9.15  
HF-30 (kW/m<sup>2</sup>) : >= 10.9  
Flame spread at 10 minutes (mm) : 110  
Flame spread at 20 minutes (mm) : 220  
Flame spread at 30 minutes (mm) : -1  
Peak light attenuation (%) : 38.12  
Time to peak light attenuation : 10 minutes 38 seconds (638 s)  
Total integrated smoke (%.min) : 267.34  
**Potential classification** : **A2(fl)/B(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.

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**Date**  
14<sup>th</sup> of May, 2012

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89201754

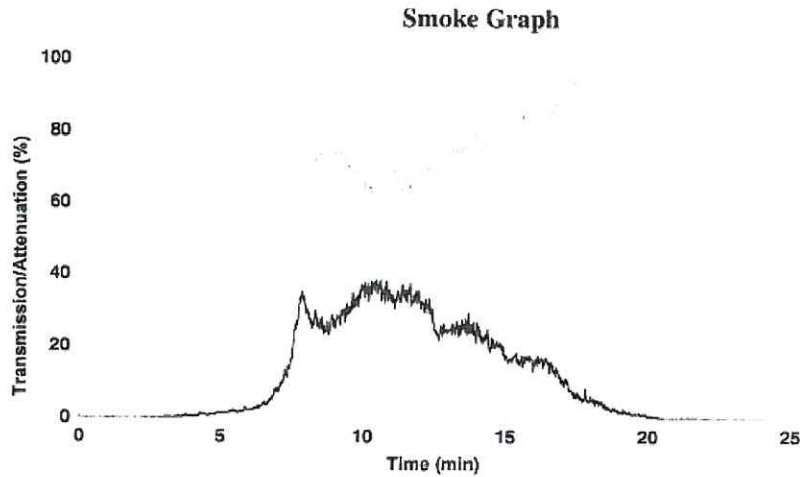
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Test name : Prod #2  
File name : D:\FRPFILES\12050017.CSV

**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	445	11.5	4.785	510	-	3.7	-
110	604	10.8	6.113	560	-	3.0	-
160	804	10.1	7.533	610	-	2.5	-
210	1046	9.4	8.660	660	-	2.2	-
260	-	8.3	-	710	-	1.8	-
310	-	7.2	-	760	-	1.6	-
360	-	6.2	-	810	-	1.4	-
410	-	5.3	-	860	-	1.2	-
460	-	4.4	-	910	-	1.1	-

**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.



## APPENDIX I: Flooring Radiant Panel Single Specimen Report

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### Flooring Radiant Panel Single Specimen Report

Standard : EN ISO 9239-1:2002  
Laboratory : TÜV Rheinland Nederland B.V.  
Sponsor : Forbo CORAI - Nuway + Textile insert - 89201754 - ipk  
Date of test : May 08 2012

Specimen description : MT12-35542.01  
Test name : Prod #3  
File name : D:\FRPFILES\12050018.CSV  
Test number in series : 4

Flux calibration file name : C:\FRPSOFT\CALIB\FLX12006.CSV

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

Test duration : 21 minutes 41 seconds (1301 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 17 seconds (137 s)  
Time to flameout : 21 minutes 39 seconds (1299 s)  
Extent of burning (mm) : 230  
Critical flux at extinguishment (kW/m<sup>2</sup>) : 8.93  
HF-10 (kW/m<sup>2</sup>) : >= 10.9  
HF-20 (kW/m<sup>2</sup>) : 8.93  
HF-30 (kW/m<sup>2</sup>) : >= 10.9  
Flame spread at 10 minutes (mm) : 100  
Flame spread at 20 minutes (mm) : 230  
Flame spread at 30 minutes (mm) : -]  
Peak light attenuation (%) : 39.57  
Time to peak light attenuation : 10 minutes 47 seconds (647 s)  
Total integrated smoke (%.min) : 292.18  
**Potential classification** : **A2(f1)/B(f1)**  
**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**

**Date**  
14<sup>th</sup> of May, 2012

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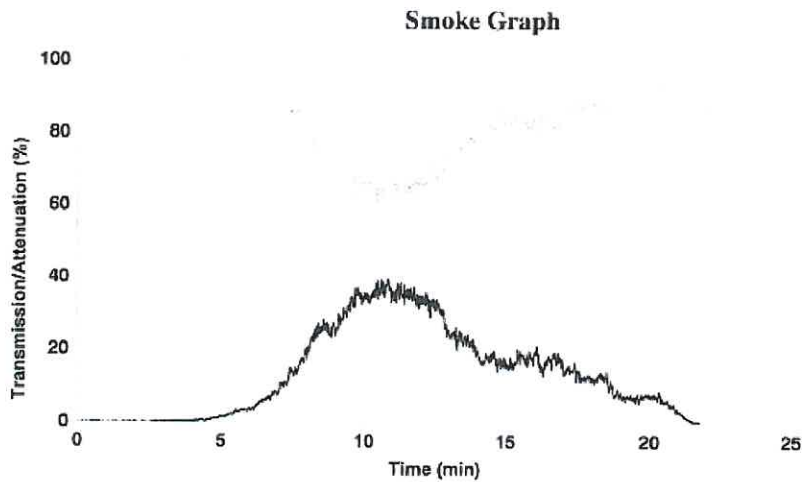
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Test name : Prod #3  
File name : D:\FRPFILES\12050018.CSV

**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	429	11.5	4.613	510	-	3.7	-
110	636	10.8	6.437	560	-	3.0	-
160	817	10.1	7.655	610	-	2.5	-
210	1003	9.4	8.304	660	-	2.2	-
260	-	8.3	-	710	-	1.8	-
310	-	7.2	-	760	-	1.6	-
360	-	6.2	-	810	-	1.4	-
410	-	5.3	-	860	-	1.2	-
460	-	4.4	-	910	-	1.1	-

**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.