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Testreport

Project number: 89210096
Report number: 89210096.01br

Date
05/08/2016

Project number
89210096

Report number
89210096.01br

Phone number client
-

Received:

A resilient floor covering, marked as: "0.55/5T Loose-Lay";
TÜV-reference: MT16-112331.01

Fax number client
-

Sampling procedure:

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

The samples have been received in week 26 of 2016.

Order:

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

Article
0.55/5T Loose-Lay

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
I : Flooring Radiant Panel Single Specimen Report – 8 pages

Results:

See page three and four.

Appendix:

See page five up to and including twelve.

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.

PRODUCT IDENTIFICATION

Applicant : KDF Co., Ltd.
Name : **0.55/5T Loose-Lay***
Type of colouring/patterning : Wild*
Batch number : 2016.6.13*
Dimensions : 177.8mm x 1219.2mm*
Total thickness : 5 mm*
Thickness of wearlayer : 0.55 mm*

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Total thickness (mm) : 5.0**
Total mass (gr/m²) : 8405**
Density (kg/m³) : 1674**

* Applicant's declaration

** Determination by the test house after conditioning to constant mass is achieved.



Figure 1, Picture of the received sample (surface)



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 : 27/07/2016
 Conditioning time, climate : ≥ 7 days, 23 ± 2 °C and 50 ± 5 %
 Description of substrate : Fibre cement board, 8 ± 2 mm, 1800 ± 200 kg/m³
 conforming to EN 13238.
 Flame application : Surface.
 Flame application time : 15 seconds.

Orientation:	Length			Width		
Total burning time ¹	15	15	15	15	15	15
Flame tip reaches 150 mm (s)	No	No	No	No	No	No
Extent of damaged area, length (mm)	65	58	60	60	60	58
Extent of damaged area, width (mm)	12	12	12	12	12	12
Material melts (yes/no)	Yes	Yes	Yes	Yes	Yes	Yes
Shrinks away ² (yes/no)	No	No	No	No	No	No
Glowing ³ (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

Determination of the burning behaviour using a radiant heat source

Method EN ISO 9239-1:2010

Date of testing : 27/07/2017
 Conditioning time, climate : ≥ 7 days, 23 ± 2 °C and 50 ± 5 %
 Description of substrate : Fibre cement board, 8 ± 2 mm, 1800 ± 200 kg/m³
 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 ²)	Peak light attenuation (%)	Smoke production (%.min)
1, Length	24.0	8.5	41.3	182
2, Width	26.0	8.1	39.9	189
3, Width	28.0	7.8	51.2	234
4, Width	15.0	10.0	42.2	144
Mean, Width	23.0	8.6	44.4	189

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 “**0.55/5T Loose-Lay**”, in relation to its reaction to fire behaviour is classified: **B_n**.

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

The aforementioned quality meets the requirement of reaction to fire classification:
B_n – s1

The classification is valid for the following end use applications:

- End use substrates of classes A1 and A2-s1,d0.
- 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 Wolff



Review:
Mrs. E. Zwier



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APPENDIX I: Flooring Radiant Panel Single Specimen Report

Report produced with the Fire Testing Technology FRPSoft software

page 1

Flooring Radiant Panel Single Specimen Report

Standard : EN ISO 9239-1:2010
Laboratory : TÜV Rheinland Nederland B.V.
Sponsor : TÜV Rheinland Korea 89210096
Date of test : Jul. 27 2016

Specimen description : 0.55 5T Loose lay MT16-112331.01
Test name : # 1 Prod
File name : D:\FRPFILES\16070022.CSV
Test number in series : 4

Flux calibration file name : C:\FRPSOFT2.9A\CALIB\FLX16010.CSV

Thickness (mm) : 5
Density (kg/m³) : 1674

Test duration : 13 minutes 30 seconds (810 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 05 seconds (125 s)
Time to flameout : 13 minutes 27 seconds (807 s)
Extent of burning (mm) : 240
Critical flux at extinguishment (kW/m²) : 8.49
HF-10 (kW/m²) : 8.67
HF-20 (kW/m²) : Not calculated (test duration < 20 minutes)
HF-30 (kW/m²) : Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm) : 230
Flame spread at 20 minutes (mm) : Not measured
Flame spread at 30 minutes (mm) : Not measured
Peak light attenuation (%) : 41.25
Time to peak light attenuation : 6 minutes 52 seconds (412 s)
Total integrated smoke (%.min) : 181.79
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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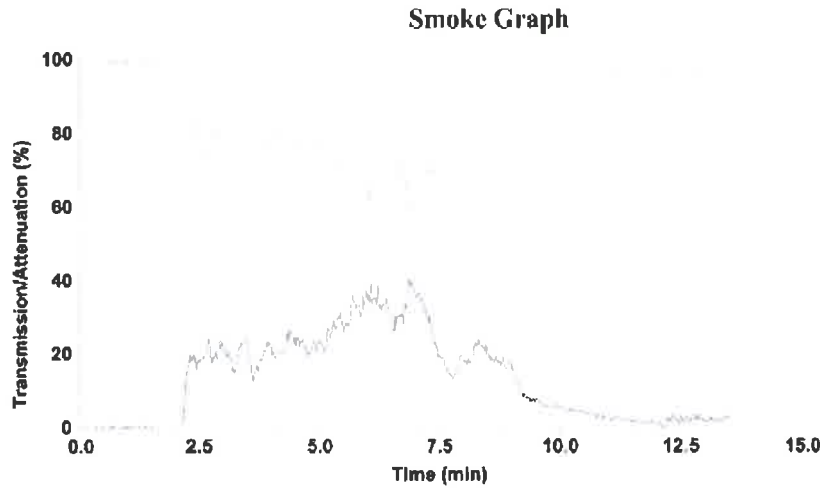
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Test name : # 1 Prod
File name : D:\FRPFILES\16070022.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)	Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)
60	185	11.3	2.092	510	-	3.7	-
110	258	10.5	2.712	560	-	3.1	-
160	427	9.8	4.196	610	-	2.6	-
210	538	9.0	4.852	660	-	2.2	-
260	-	8.1	-	710	-	1.9	-
310	-	7.3	-	760	-	1.6	-
360	-	6.3	-	810	-	1.4	-
410	-	5.3	-	860	-	1.3	-
460	-	4.4	-	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 9239-1:2010
Laboratory : TÜV Rheinland Nederland B.V.
Sponsor : TÜV Rheinland Korea 89210096
Date of test : Jul. 27 2016

Specimen description : 0.55 5T Loose lay MT16-112331.01
Test name : # 2 Cross
File name : D:\FRPFILES\16070023.CSV
Test number in series : 4

Flux calibration file name : C:\FRPSOFT2.9A\CALIB\FLX16010.CSV

Thickness (mm) : 5
Density (kg/m³) : 1674

Test duration : 12 minutes 27 seconds (747 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 09 seconds (129 s)
Time to flameout : 12 minutes 25 seconds (745 s)
Extent of burning (mm) : 260
Critical flux at extinguishment (kW/m²) : 8.14
HF-10 (kW/m²) : 8.49
HF-20 (kW/m²) : Not calculated (test duration < 20 minutes)
HF-30 (kW/m²) : Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm) : 240
Flame spread at 20 minutes (mm) : Not measured
Flame spread at 30 minutes (mm) : Not measured
Peak light attenuation (%) : 39.91
Time to peak light attenuation : 5 minutes 34 seconds (334 s)
Total integrated smoke (%.min) : 188.52

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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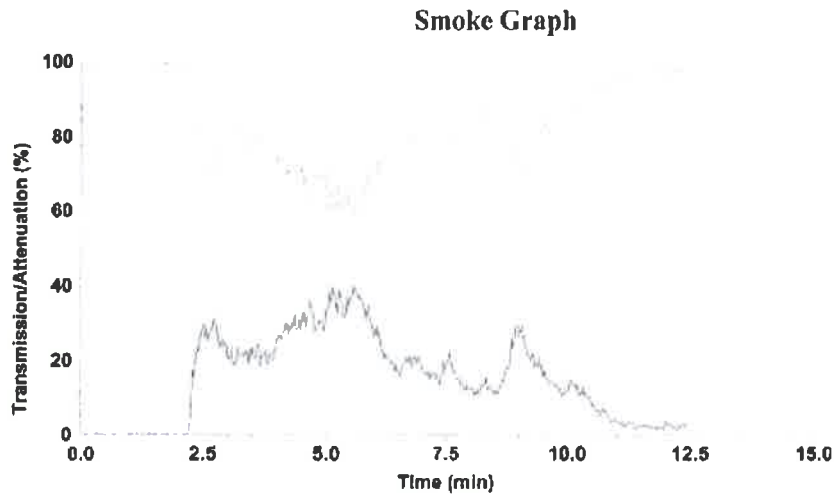
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Test name : # 2 Cross
File name : D:\FRPFILES\16070023.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m ²)	Qsb (MJ/m ²)	Position (mm)	Time (s)	Flux (kW/m ²)	Qsb (MJ/m ²)
60	182	11.3	2.058	510	-	3.7	-
110	260	10.5	2.733	560	-	3.1	-
160	428	9.8	4.206	610	-	2.6	-
210	549	9.0	4.951	660	-	2.2	-
260	676	8.1	5.499	710	-	1.9	-
310	-	7.3	-	760	-	1.6	-
360	-	6.3	-	810	-	1.4	-
410	-	5.3	-	860	-	1.3	-
460	-	4.4	-	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 9239-1:2010
Laboratory : TÜV Rheinland Nederland B.V.
Sponsor : TÜV Rheinland Korea 89210096
Date of test : Jul. 27 2016

Specimen description : 0.55 5T Loose lay MT16-112331.01
Test name : # 3 Cross
File name : D:\FRPFILES\16070024.CSV
Test number in series : 4

Flux calibration file name : C:\FRPSOFT2.9A\CALIB\FLX16010.CSV

Thickness (mm) : 5
Density (kg/m³) : 1674

Test duration : 14 minutes 15 seconds (855 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 05 seconds (125 s)
Time to flameout : 14 minutes 13 seconds (853 s)
Extent of burning (mm) : 280
Critical flux at extinguishment (kW/m²) : 7.81
HF-10 (kW/m²) : 8.31
HF-20 (kW/m²) : Not calculated (test duration < 20 minutes)
HF-30 (kW/m²) : Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm) : 250
Flame spread at 20 minutes (mm) : Not measured
Flame spread at 30 minutes (mm) : Not measured
Peak light attenuation (%) : 51.18
Time to peak light attenuation : 5 minutes 24 seconds (324 s)
Total integrated smoke (%.min) : 233.82
Potential classification : C(n)
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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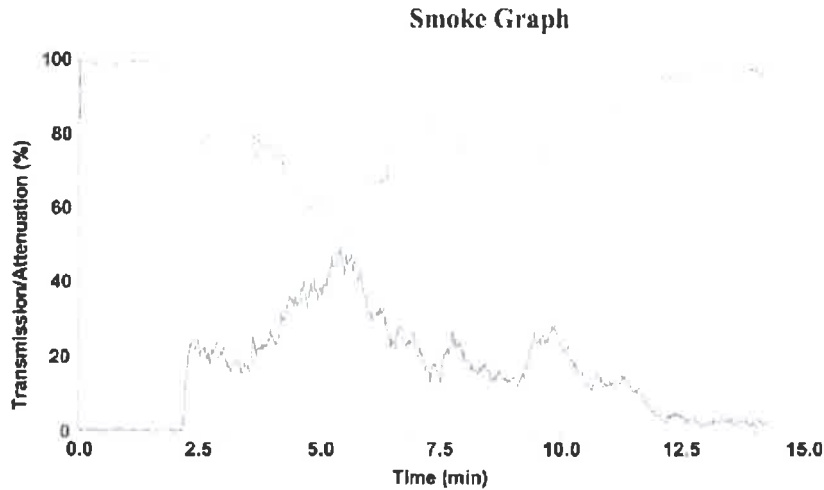
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Test name : # 3 Cross
File name : D:\FRPFILES\16070024.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m ²)	Qsb (MJ/m ²)	Position (mm)	Time (s)	Flux (kW/m ²)	Qsb (MJ/m ²)
60	193	11.3	2.183	510	-	3.7	-
110	264	10.5	2.775	560	-	3.1	-
160	364	9.8	3.577	610	-	2.6	-
210	459	9.0	4.140	660	-	2.2	-
260	628	8.1	5.109	710	-	1.9	-
310	-	7.3	-	760	-	1.6	-
360	-	6.3	-	810	-	1.4	-
410	-	5.3	-	860	-	1.3	-
460	-	4.4	-	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 9239-1:2010
Laboratory : TÜV Rheinland Nederland B.V.
Sponsor : TÜV Rheinland Korea 89210096
Date of test : Jul. 27 2016

Specimen description : 0.55 5T Loose lay MT16-112331.01
Test name : # 4 Cross
File name : D:\FRPFILES\16070025.CSV
Test number in series : 4

Flux calibration file name : C:\FRPSOFT2.9A\CALIB\FLX16010.CSV

Thickness (mm) : 5
Density (kg/m³) : 1674

Test duration : 12 minutes 10 seconds (730 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 03 seconds (123 s)
Time to flameout : 12 minutes 08 seconds (728 s)
Extent of burning (mm) : 150
Critical flux at extinguishment (kW/m²) : 9.96
HF-10 (kW/m²) : 9.96
HF-20 (kW/m²) : Not calculated (test duration < 20 minutes)
HF-30 (kW/m²) : Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm) : 150
Flame spread at 20 minutes (mm) : Not measured
Flame spread at 30 minutes (mm) : Not measured
Peak light attenuation (%) : 42.15
Time to peak light attenuation : 5 minutes 41 seconds (341 s)
Total integrated smoke (%.min) : 143.88
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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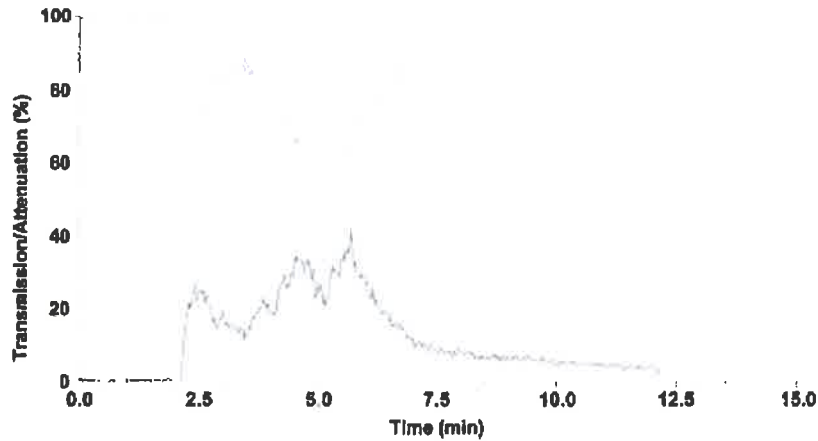
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Smoke Graph



Test name : # 4 Cross
File name : D:\FRPFILES\16070025.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)	Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)
60	205	11.3	2.319	510	-	3.7	-
110	310	10.5	3.259	560	-	3.1	-
160	-	9.8	-	610	-	2.6	-
210	-	9.0	-	660	-	2.2	-
260	-	8.1	-	710	-	1.9	-
310	-	7.3	-	760	-	1.6	-
360	-	6.3	-	810	-	1.4	-
410	-	5.3	-	860	-	1.3	-
460	-	4.4	-	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.