

Test report no.: <i>Testrapport nr.:</i>	89221112 001	Order No.: <i>Opdracht nr.:</i>	221112	Page 1 of 14 <i>Pagina 1 van 14</i>
Client Reference No.: <i>Klantreferentie nr.:</i>	4501236781	Order date: <i>Opdrachtdatum:</i>	12.05.2022	
Client: <i>Klant:</i>	Forbo Flooring B.V., PO Box 13, 1560 AA Krommenie, The Netherlands			
Test item: <i>Testvoorwerp:</i>	Resilient floor covering			
Identification/ Type No.: <i>Benaming / Type nr.:</i>	Marmoleum Acoustic - 33055			
Order content: <i>Inhoud opdracht:</i>	Classification of burning behaviour			
Test specification: <i>Testomschrijving:</i>	EN 13501-1:2018 Classification of burning behaviour <i>Test methods: Ignitability of products subjected to direct impingement of flame (EN ISO 11925-2:2020) and determination of the burning behaviour using a radiant heat source (EN ISO 9239-1:2010)</i>			
Date of sample receipt: <i>Ontvangstdatum monster:</i>	13.05.2022			
Test sample No: <i>Testproefstuk nr.:</i>	MT22-221112.01			
Testing period: <i>Testperiode:</i>	13.05.2022 - 07.06.2022			
Place of testing: <i>Testlocatie:</i>	Westervoortsedijk 73, 6827 AV Arnhem			
Testing laboratory: <i>Testlaboratorium:</i>	TÜV Rheinland Nederland B.V.			
Test result*: <i>Testresultaat*:</i>	See Other			
tested by: <i>getest door:</i>			authorized by: <i>geautoriseerd door:</i>	
Date: 08.06.2022 <i>Datum:</i>	Ondertekend door: Michiel van de Vlekkert		Issue Date: 08.06.2022 <i>Datum uitgave:</i>	Signed by: Tim Zandvliet
Position / functie:	jr. Engineer		Position / functie:	Expert
Others / <i>Andere:</i>	Test result: See clause 4 on page 5			
Condition of the test item at delivery: <i>Toestand van het test voorwerp bij ontvangst:</i>	Test item complete and undamaged			
* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
* Legenda:	P(ass) = voldoet aan test omschrijving	F(ail) = voldoet niet aan test omschrijving	N/A = niet van toepassing	N/T = niet getest
This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark. <i>Dit testrapport heeft alleen betrekking op het voorgenoemde test voorwerp. Zonder toestemming van het testcentrum mag dit testrapport niet in delen worden vermenigvuldigd. Dit keuringsrapport geeft geen recht op het dragen van enig keurmerk.</i>				

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Remarks
Opmerkingen

1	The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request. For the influence of the measuring uncertainties on the results, reference is made to the validation of the respective methods. <i>De apparatuur welke tijdens de gespecificeerde testperiode is gebruikt, is gekalibreerd volgens ons kalibratieprogramma. De apparatuur voldoet aan de eisen welke zijn opgenomen in de relevante normen. De traceerbaarheid van de gebruikte testapparatuurs is gewaarborgd door naleving van de voorschriften in ons kwaliteitsmanagementsysteem. Gedetailleerde informatie over testomstandigheden, apparatuur en meetonzekerheid is beschikbaar in het testlaboratorium en kan op verzoek worden verstrekt. Voor de invloed van de meetonzekerheden op de resultaten wordt verwezen naar de validatie van de respectievelijke methode c.q. verrichting</i>
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3	Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Tests clauses marked with ^a are performed under ISO 17025 accreditation. Deviations of testing specification(s), test locations or customer requirements are listed in specific test clause in the report. This report is only to be read as a whole. No opinions or interpretation are included in this report. This test report consists of multiple pages and is only to be read as a whole. The number of pages can be seen in the header on the top right of each page, the report ends when the last page is reached. TÜV Rheinland Nederland B.V. is solely responsible for the content. <i>Test onderdelen welke met * zijn gemarkeerd zijn uitbesteed aan gekwalificeerde onderaannemers en zijn beschreven in het respectievelijke test onderdeel van dit rapport. Test onderdelen welke met ^a zijn gemarkeerd zijn onder ISO 17025 accreditatie uitgevoerd. Afwijkingen van testspecificatie(s), testlocaties of klant eisen zijn vermeld in het van toepassing zijnde onderdeel in het rapport. Het rapport dient als geheel te worden gelezen. Er zijn geen opinies en interpretaties opgenomen binnen het rapport. Dit rapport bestaat uit meerdere pagina's en dient al geheel gelezen te worden. Het aantal pagina's is rechtsboven in de koptekst van dit rapport vermeld en eindigt wanneer de laatste pagina is bereikt. TÜV Rheinland Nederland is als enige verantwoordelijk voor de inhoud van het rapport.</i>
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Product description
Product omschrijving

1	Product details: <i>Product details:</i>	Product identity: Marmoleum Acoustic - 33055 Product type: Resilient floor covering Sampling code: 01.28612.086.17
2	Other: <i>Andere:</i>	Test sample(s), as well sample information, description, product details and intended usage was provided by customer.
3	Test sample obtaining: <i>Selectie van het proefstuk:</i>	☐ Sending by customer ☒ Sampling by TÜV Rheinland Group ☐ others:

Figure 1: Picture of the received sample (surface)



Figure 2: Picture of the received sample (back)



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Clause Deel	Requirements - Tests / Vereisten - Tests	Measuring results – Remarks Meetresultaten – Opmerkingen	Result Resultaat
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1	Construction data (indicative) of the product obtained by the testlaboratory after pre-conditioning <i>01-4.3-P.02-322-WI01</i>	
	Test condition	23 ± 2°C and 50 ± 4% relative humidity
	Pre conditioning, duration	≥ 48 h & until constant mass is achieved
	Total thickness (mm)	4.2
	Total mass (g/m ²)	4155
	Density (kg/m ³)	991
	<i>Note: the determined construction data are used for determination of constant mass, the used testmethod is not in accordance with the determination of construction data according the specification standard. Therefore the testresults should be handled as indicative.</i>	

2	Ignitability of products subjected to direct impingement of flame <i>EN ISO 11925-2:2020^a</i>							
	Date of testing			02.06.2022				
	Pre-conditioning, climate			23 ± 2°C and 50 ± 4% relative humidity				
	Pre-conditioning, duration			≥ 48 h & until constant mass is achieved				
	Description of substrate			Particle board, thickness 20 ± 2 mm, density 680 ± 50 kg/m ³ conforming to EN 13238:2018				
	Flame application			Surface				
	Flame application time (s)			15				
	Measurement uncertainty			Caused by the destructive nature of the test and pass/fail result no measurement uncertainty can be determined. Based on the validation of the test procedure and measurement set-up there is a presumption of conformity established which is approved with ISO 17025 accreditation.				
	Requirements according EN 13501-1			See clause 5 of this report				
	Test result(s)							
	Orientation		Length			Width		
	Test sample		1	2	3	1	2	3
	Ignition of the sample		Yes	Yes	Yes	Yes	Yes	Yes
	Flame tip reached 150 mm above the application point		No	No	No	No	No	No
	Duration after application when the flame tip reached the 150 mm above the application point (s)		N/A	N/A	N/A	N/A	N/A	N/A
	Extent of damaged area, length (mm)		35	30	38	35	32	32
	Extent of damaged area, width (mm)		11	11	13	12	12	12
	Material melts		Yes	Yes	Yes	Yes	Yes	Yes
	Shrinks away from flame without being ignited		No	No	No	No	No	No
After glowing		No	No	No	No	No	No	
Flaming droplets/particles which caused ignition of filter paper		No	No	No	No	No	No	

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Clause Deel	Requirements - Tests / Vereisten - Tests	Measuring results – Remarks Meetresultaten – Opmerkingen	Result Resultaat
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3

Determination of the burning behaviour using a radiant heat source <i>EN ISO 9239-1:2010^a</i>					
Date of testing		02.06.2022 & 07.06.2022			
Pre-conditioning, climate		23 ± 2°C and 50 ± 4% relative humidity			
Pre-conditioning, duration		≥ 48 h & until constant mass is achieved			
Description of substrate		Particle board, thickness 20 ± 2 mm, density 680 ± 50 kg/m ³ conforming to EN 13238:2018			
Fixing method		The samples are glued to the substrate with Eurocol 614 / 611.			
Measurement uncertainty		The measurement uncertainty for this test strongly depends on the products that are tested, based on that influence a measurement uncertainty for the method can't be determined. Information on the influence of the different products can be found in ISO 9239-1:2010 Annex B "Precision of the test method". Based on the validation of the test procedure and measurement set-up there is a presumption of conformity established which is approved with ISO 17025 accreditation.			
Requirements according EN 13501-1		See clause 5 of this report			
Test result(s)					
Test sample	1	2	3	4	Mean
Orientation (Length: ↑ , Width: T)	↑	T	↑	↑	↑
Flame spread (cm)	36	34	30	31	32
CHF / HF-30 (kW/m ²)	6.3	6.8	7.6	7.4	7.1
Maximum light attenuation (%)	55.9	47.9	28.3	43.4	42.5
Smoke production (%.min)	375	335	282	292	316
Observations: Specimen 1, 2, 3 and 4: No flashing, transitory- or sustained flaming are observed. Specimen 1, 2, 3 and 4: Extinguished naturally before the end of the test duration.					

4	Classification of burning behaviour <i>EN 13501-1:2018^a</i>				
	The product, Marmoleum Acoustic - 33055 , in relation to its reaction to fire behaviour is classified:				C_{fl}
	The additional classification in relation to smoke production is:				s1
	Reaction to fire classification : C_{fl} – s1				
	Field of application - As a floor covering in accordance with the nominal product parameters given on page 3. - On end use substrates of wood and of classes A1 and A2-s1,d0 according to EN 13238:2010. - Glued down with Eurocol 614 / 611.				
	Statements - This document does not represent type approval or certification of the product. - 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 validity of this report will expire directly after alterations or modifications of the examined product (combination)(s) and/or the criteria.				

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Clause Deel	Requirements - Tests / Vereisten - Tests	Measuring results – Remarks Meetresultaten – Opmerkingen	Result Resultaat
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5	Potential classes of reaction to fire performance for floorings EN 13501-1:2018			
	Class	Test method(s)	Classification criteria	Additional classifications
	A1 _{fl}	EN ISO 1182 ^a and	$\Delta T \leq 30 \text{ }^{\circ}\text{C}$; and $\Delta m \leq 50 \text{ } \%$; and $t_f = 0$ (i.e. no sustained flaming)	-
		EN ISO 1716	$PCS \leq 2.0 \text{ MJ/kg}$ ^a and $PCS \leq 2.0 \text{ MJ/m}^2$ ^b and $PCS \leq 1.4 \text{ MJ/m}^2$ ^c and $PCS \leq 2.0 \text{ MJ/kg}$ ^d	-
	A2 _{fl}	EN ISO 1182 ^a or	$\Delta T \leq 50 \text{ }^{\circ}\text{C}$ and $\Delta m \leq 50 \text{ } \%$ and $t_f \leq 20 \text{ s}$	-
		EN ISO 1716 and	$PCS \leq 3.0 \text{ MJ/kg}$ ^a and $PCS \leq 4.0 \text{ MJ/m}^2$ ^b and $PCS \leq 4.0 \text{ MJ/m}^2$ ^c and $PCS \leq 3.0 \text{ MJ/kg}$ ^d	-
		EN ISO 9239-1 ^e	$CHF \geq 8.0 \text{ kW/m}^2$	Smoke production ^g
	B _{fl}	EN ISO 9239-1 ^e and	$CHF \geq 8.0 \text{ kW/m}^2$	Smoke production ^g
		EN ISO 11925-2 ^h : Exposure = 15 s	$F_s \leq 150 \text{ mm}$ within 20 s	-
	C _{fl}	EN ISO 9239-1 ^e and	$CHF \geq 4.5 \text{ kW/m}^2$	Smoke production ^g
		EN ISO 11925-2 ^h : Exposure = 15 s	$F_s \leq 150 \text{ mm}$ within 20 s	-
	D _{fl}	EN ISO 9239-1 ^e and	$CHF \geq 3.0 \text{ kW/m}^2$	Smoke production ^g
		EN ISO 11925-2 ^h : Exposure = 15 s	$F_s \leq 150 \text{ mm}$ within 20 s	-
	E _{fl}	EN ISO 11925-2 ^h : Exposure = 15 s	$F_s \leq 150 \text{ mm}$ within 20 s	-
	F _{fl}	EN ISO 11925-2 ^h : Exposure = 15 s	$F_s > 150 \text{ mm}$ within 20 s	-
	^a For homogeneous products and substantial components of non-homogeneous products. ^b For any external non-substantial component of non-homogeneous products. ^c For any internal non-substantial component of non-homogeneous products. ^d For the product as a whole. ^e Test duration = 30 min. ^f Critical flux is defined as the radiant flux at which the flame extinguishes or the radiant flux after a test period of 30 min, whichever is the lower (i.e. the flux corresponding with the furthest extent of spread of flame). ^g s1 = Smoke $\leq 750 \text{ } \%$ minutes; s2 = not s1. ^h Under conditions of surface flame attack and, if appropriate to the end use application of the product, edge flame attack.			

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page 1

Flooring Radiant Panel Single Specimen Report

Standard	: EN ISO 9239-1:2010
Laboratory	: TÜV Rheinland Nederland B.V.
Sponsor	: Forbo
Date of test	: Jun. 02 2022
Specimen description	: Marmoluem Acoustic 33055
Test name	: # 1 Prod
File name	: D:\FRPFILES\22060001.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT2.9A\CALIB\FLX22002.CSV
Thickness (mm)	: 4.2
Density (kg/m ³)	: 991
Test duration	: 29 minutes 30 seconds (1770 s)
Substrate used?	: Yes
Substrate	: Particle board
Fixing method	: adhesive
Conditioned?	: Yes
Conditioning temp. (°C)	: 23
Conditioning RH (%)	: 50

Test Results

Time to ignition	: 2 minutes 05 seconds (125 s)
Time to flameout	: 29 minutes 26 seconds (1766 s)
Extent of burning (mm)	: 360
Critical flux at extinguishment (kW/m ²)	: 6.32
HF-10 (kW/m ²)	: 8.54
HF-20 (kW/m ²)	: 7.40
HF-30 (kW/m ²)	: Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm)	: 250
Flame spread at 20 minutes (mm)	: 310
Flame spread at 30 minutes (mm)	: Not measured
Peak light attenuation (%)	: 55.89
Time to peak light attenuation	: 7 minutes 52 seconds (472 s)
Total integrated smoke (%.min)	: 375.13
Potential classification	: C(II)
Smoke production classification	: s1

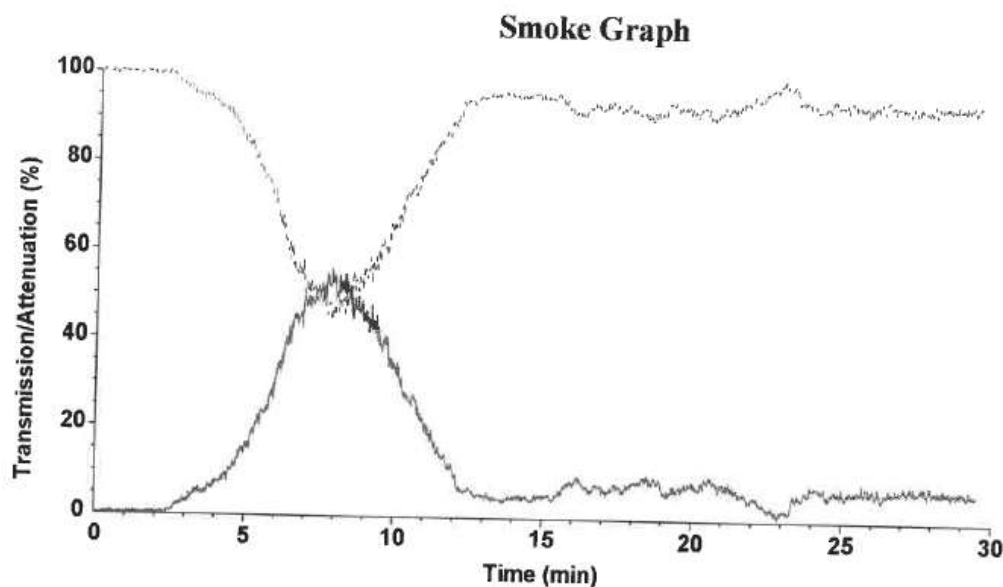
These results relate only to the behaviour of the specimens of the product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

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Test name : # 1 Prod
File name : D:\FRPFILES\22060001.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	247	11.3	2.800	510	-	3.7	-
110	317	10.6	3.373	560	-	3.1	-
160	368	10.1	3.700	610	-	2.6	-
210	495	9.3	4.627	660	-	2.2	-
260	672	8.3	5.605	710	-	1.9	-
310	1126	7.4	8.327	760	-	1.7	-
360	-	6.3	-	810	-	1.5	-
410	-	5.3	-	860	-	1.4	-
460	-	4.4	-	910	-	1.3	-

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	: Forbo
Date of test	: Jun. 02 2022
Specimen description	: Marmoluem Acoustic 33055
Test name	: # 2 Cross
File name	: D:\FRPFILES\22060002.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT2.9A\CALIB\FLX22002.CSV
Thickness (mm)	: 4.2
Density (kg/m³)	: 991
Test duration	: 25 minutes 03 seconds (1503 s)
Substrate used?	: Yes
Substrate	: Particle 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	: 24 minutes 57 seconds (1497 s)
Extent of burning (mm)	: 340
Critical flux at extinguishment (kW/m²)	: 6.75
HF-10 (kW/m²)	: 8.54
HF-20 (kW/m²)	: 6.75
HF-30 (kW/m²)	: Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm)	: 250
Flame spread at 20 minutes (mm)	: 340
Flame spread at 30 minutes (mm)	: Not measured
Peak light attenuation (%)	: 47.92
Time to peak light attenuation	: 7 minutes 36 seconds (456 s)
Total integrated smoke (%.min)	: 334.77

Potential classification	: C(fl)
Smoke production classification	: s1

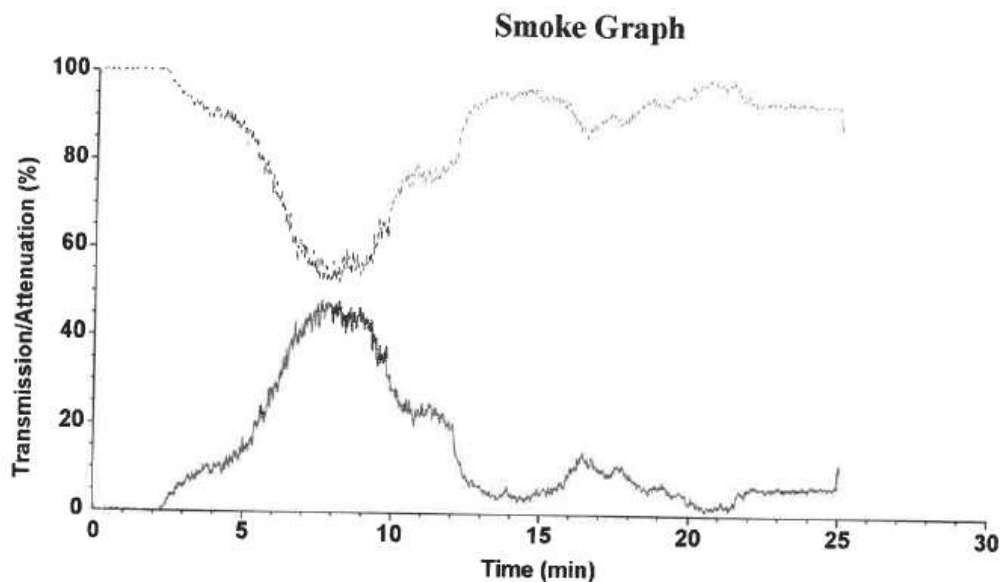
These results relate only to the behaviour of the specimens of the product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

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Test name : # 2 Cross
File name : D:\FRPFILES\22060002.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	204	11.3	2.313	510	-	3.7	-
110	308	10.6	3.277	560	-	3.1	-
160	396	10.1	3.981	610	-	2.6	-
210	490	9.3	4.580	660	-	2.2	-
260	642	8.3	5.355	710	-	1.9	-
310	885	7.4	6.545	760	-	1.7	-
360	-	6.3	-	810	-	1.5	-
410	-	5.3	-	860	-	1.4	-
460	-	4.4	-	910	-	1.3	-

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	: Forbo
Date of test	: Jun. 07 2022
Specimen description	: Marmoluem Acoustic 33055
Test name	: # 3 Prod
File name	: D:\FRPFILES\22060007.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT2.9A\CALIB\FLX22002.CSV
Thickness (mm)	: 4.2
Density (kg/m³)	: 991
Test duration	: 28 minutes 06 seconds (1686 s)
Substrate used?	: Yes
Substrate	: Particle 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	: 27 minutes 58 seconds (1678 s)
Extent of burning (mm)	: 300
Critical flux at extinguishment (kW/m²)	: 7.58
HF-10 (kW/m²)	: 9.35
HF-20 (kW/m²)	: 7.58
HF-30 (kW/m²)	: Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm)	: 210
Flame spread at 20 minutes (mm)	: 300
Flame spread at 30 minutes (mm)	: Not measured
Peak light attenuation (%)	: 28.34
Time to peak light attenuation	: 8 minutes 07 seconds (487 s)
Total integrated smoke (%.min)	: 281.87
Potential classification	: C(f)
Smoke production classification	: s1

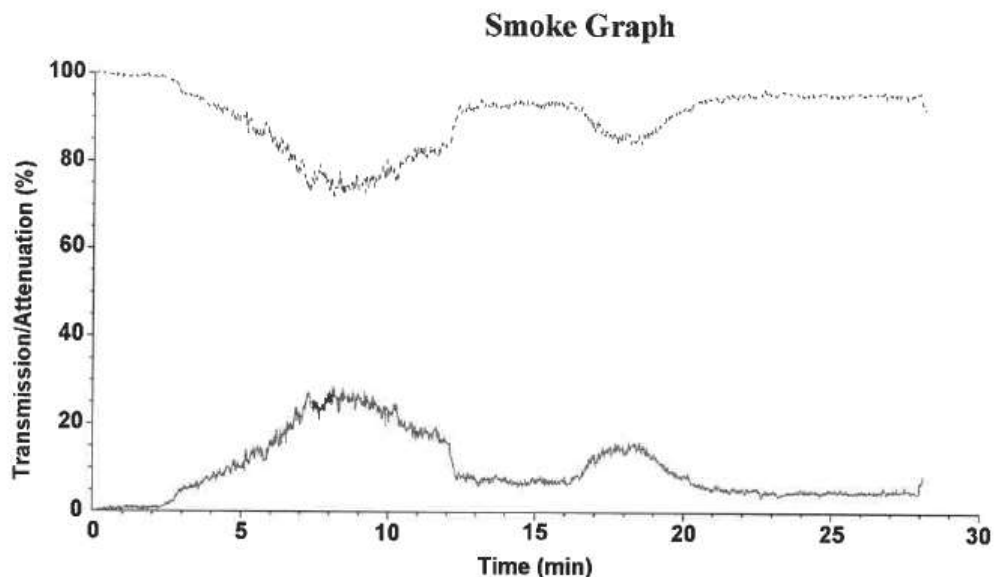
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Test name : # 3 Prod
File name : D:\FRPFILES\22060007.CSV

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	233	11.3	2.642	510	-	3.7	-
110	358	10.6	3.809	560	-	3.1	-
160	464	10.1	4.665	610	-	2.6	-
210	608	9.3	5.683	660	-	2.2	-
260	817	8.3	6.815	710	-	1.9	-
310	-	7.4	-	760	-	1.7	-
360	-	6.3	-	810	-	1.5	-
410	-	5.3	-	860	-	1.4	-
460	-	4.4	-	910	-	1.3	-

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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page 1

Flooring Radiant Panel Single Specimen Report

Standard	: EN ISO 9239-1:2010
Laboratory	: TÜV Rheinland Nederland B.V.
Sponsor	: Forbo
Date of test	: Jun. 07 2022
Specimen description	: Marmoluem Acoustic 33055
Test name	: # 4 Prod
File name	: D:\FRPFILES\22060008.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT2.9A\CALIB\FLX22002.CSV
Thickness (mm)	: 4.2
Density (kg/m ³)	: 991
Test duration	: 23 minutes 34 seconds (1414 s)
Substrate used?	: Yes
Substrate	: Particle 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	: 23 minutes 31 seconds (1411 s)
Extent of burning (mm)	: 310
Critical flux at extinguishment (kW/m ²)	: 7.40
HF-10 (kW/m ²)	: 8.94
HF-20 (kW/m ²)	: 7.40
HF-30 (kW/m ²)	: Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm)	: 230
Flame spread at 20 minutes (mm)	: 310
Flame spread at 30 minutes (mm)	: Not measured
Peak light attenuation (%)	: 43.38
Time to peak light attenuation	: 8 minutes 07 seconds (487 s)
Total integrated smoke (%.min)	: 292.18

Potential classification	: C(n)
Smoke production classification	: s1

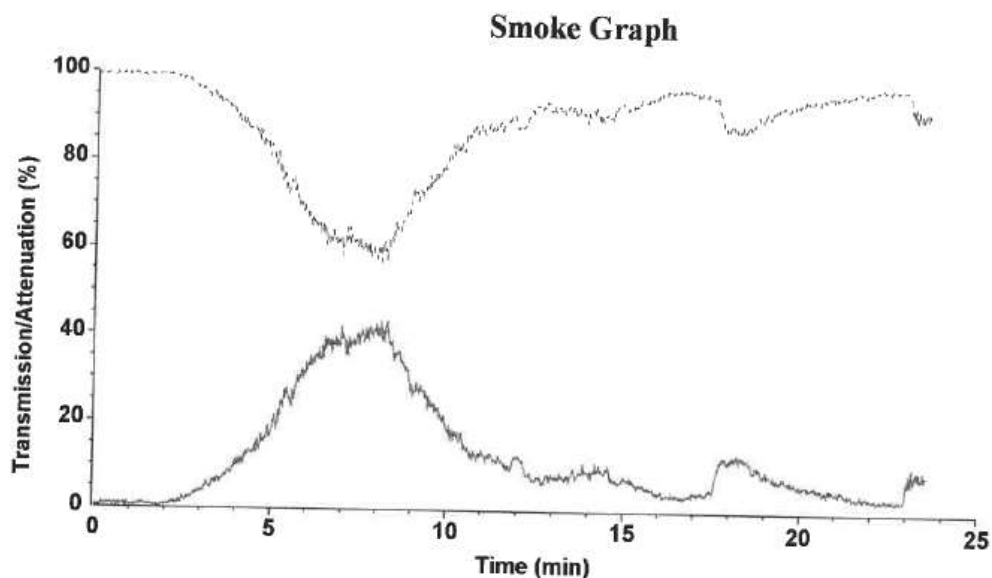
These results relate only to the behaviour of the specimens of the product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

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Test name : # 4 Prod
File name : D:\FRPFILES\22060008.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	210	11.3	2.381	510	-	3.7	-
110	302	10.6	3.214	560	-	3.1	-
160	387	10.1	3.891	610	-	2.6	-
210	508	9.3	4.748	660	-	2.2	-
260	806	8.3	6.723	710	-	1.9	-
310	1218	7.4	9.007	760	-	1.7	-
360	-	6.3	-	810	-	1.5	-
410	-	5.3	-	860	-	1.4	-
460	-	4.4	-	910	-	1.3	-

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.