Test report no.: *Testrapport nr.:*	**89223770 065**	**Order No.:** *Opdracht nr.:*	223770	
Client Reference No.: *Klantreferentie nr.:*	4501326615	**Order date:** *Opdrachtdatum:*	12.03.2024	
Client: *Klant:*	Forbo Flooring B.V., PO Box 13, 1560 AA Krommenie, The Netherlands			
Test item: *Testvoorwerp:*	Resilient floor covering			
Identification/ Type No.: *Benaming / Type nr.:*	Marmoleum Acoustic - Batch 50161			
Order content: *Inhoud opdracht:*	Assessment against EN ISO 9239-1 and EN ISO 11925-2 in accordance with harmonized standard EN 14041:2004/AC:2006 § 4.1 and Regulation (EU) 305/2011.			
Test specification: *Testomschrijving:*	EN 13501-1:2018[a] Classification of burning behaviour			

Date of sample receipt: *Ontvangstdatum monster:*	14.03.2024
Test sample No: *Testproefstuk nr.:*	MT24-223770.33
Testing period: *Testperiode:*	14.03.2024 - 30.04.2024
Place of testing: *Testlocatie:*	Westervoortsedijk 73, 6827 AV Arnhem
Testing laboratory: *Testlaboratorium:*	TÜV Rheinland Nederland B.V. (NB 0336)
Test result*: *Testresultaat*:*	See clause 4 on page 5.

tested by: *getest door:*

X

Signed by: Michiel van de Vlekkert

Date: 01.05.2024 *Datum:*

Position / *functie*: Engineer

authorized by: *geautoriseerd door:*

X

Ondertekend door: Tim Zandvliet

Issue Date: 01.05.2024 *Datum uitgave:*

Position / *functie*: LFM

Others / *Andere*: The classification assigned to the product in this report is appropriate to a declaration of conformity by the manufacturer within the context of system 3 of AVCP and CE marking under the Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products.

Condition of the test item at delivery: *Toestand van het test voorwerp bij ontvangst:* 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*

Test report no.: 89223770 065
Testrapport nr.:

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. The decision rule for statements of conformity in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance to and ILAC-G8:09/2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account. *De apparatuur die tijdens de gespecificeerde testperiode is gebruikt, is gekalibreerd volgens ons testlaboratoriumkalibratieprogramma. De apparatuur voldoet aan de eisen die zijn opgenomen in de relevante normen. De traceerbaarheid van de gebruikte testapparatuur wordt gewaarborgd door naleving van de voorschriften van ons managementsysteem. De beslisregel voor conformiteitsverklaringen in dit testrapport is gebaseerd op de "Zero Guard Band Rule" en "Simple Acceptance" in overeenstemming met en ILAC - G8:09/2019 en IEC Guide 115:2021, tenzij anders aangegeven in de toegepaste norm vermeld op pagina 1 van dit rapport of aangevraagd door de klant. Dit betekent dat er geen rekening wordt gehouden met de meetonzekerheid.*
2	As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. *Zoals contractueel overeengekomen is dit document enkel digitaal ondertekend. TÜV Rheinland heeft niet geverifieerd en kan niet verifiëren welke wettelijke of andere vereisten van toepassing zijn op dit document. Een dergelijke verificatie valt onder de verantwoordelijkheid van de gebruiker van het document. Op verzoek van de opdrachtgever kan TÜV Rheinland de geldigheid van de digitale handtekening bevestigen door een apart document. Een dergelijk verzoek moet worden gericht aan onze verkoopafdeling. Voor een dergelijke extra service zal een milieutoeslag in rekening worden gebracht.*
3	Test clauses with remark of * are subcontracted to qualified subcontractors and descripted 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 is a whole. No opinions or interpretation are included in this report. This test report consists of multiple pages and is only to be read is 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. *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.*
4	

Test report no.: 89223770 065
Testrapport nr.:

Product description
Product omschrijving

1	**Product details:** *Product details:*	Product identity: Marmoleum Acoustic – Batch 50161 Dessin: 33032 Product type: Resilient floor covering
2	**Other:** *Andere:*	Test sample(s), as well sample information, description, product details and intended usage was provided by customer.
3	**Test sample obtaining:** *Selectie van het proefstuk:*	☒ Sending by customer ☐ Sampling by TÜV Rheinland Group ☐ others:

Figure 1: Picture of the received sample (surface)

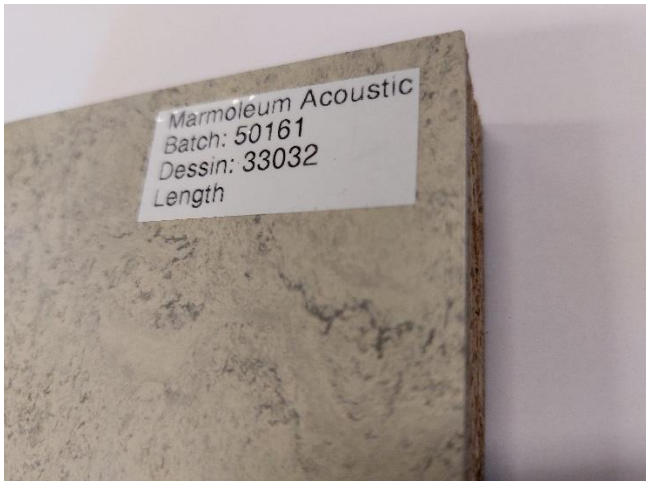


Figure 2: Picture of the received sample (back)

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

1	**Construction data (indicative) of the product obtained by the testlaboratory after pre-conditioning** *01-4.3-P.02-322-WI01*	
	Test condition	23 ± 2ºC and 50 ± 4% relative humidity
	Pre conditioning, duration	≥ 48 h & until constant mass is achieved
	Total thickness (mm)	22.1
	Total mass (g/m^2)	15442
	Density (kg/m^3)	700
	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.	

2	**Ignitability of products subjected to direct impingement of flame** *EN ISO 11925-2:2020* [a]						
	Date of testing	26.04.2024					
	Pre-conditioning, climate	23 ± 2ºC 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					
	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)	10	12	10	10	10	11
	Extent of damaged area, width (mm)	11	10	11	12	11	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

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

3 **Determination of the burning behaviour using a radiant heat source**
EN ISO 9239-1:2010 [a]

Date of testing	30.04.2024
Pre-conditioning, climate	23 ± 2ºC 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/m³ conforming to EN 13238:2018
Fixing method	The samples are glued to the substrate with Eurocol 611.
Precision of the test method	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.
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)	31	28	35	33	**33**
CHF / HF-30 (kW/m²)	7.4	8.0	6.6	7.0	**7.0**
Maximum light attenuation (%)	35.5	38.5	47.6	48.5	**43.9**
Smoke production (%.min)	226	185	225	251	**234**

Observed significant phenomena during the test:
Specimen 1, 2, 3 and 4: Melting / Blistering / Sustained Flaming.
Specimen 1, 2, 3 and 4: Extinguished manually after the end of the test duration.

4 **Classification of burning behaviour**
EN 13501-1:2018 [a]

The product, **Marmoleum Acoustic – Batch 50161**, 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 paramaters 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 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.

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

5 **Potential classes of reaction to fire performance for floorings**
EN 13501-1:2018[a]

Class	Test method(s)	Classification criteria	Additional classifications
$A1_{fl}$	EN ISO 1182 [a2] and	ΔT ≤ 30 °C; and Δm ≤ 50 %; and t_f = 0 (i.e. no sustained flaming)	-
	EN ISO 1716	*PCS* ≤ 2.0 MJ/kg [a2] and *PCS* ≤ 2.0 MJ/m² [b] and *PCS* ≤ 1.4 MJ/m² [c] and *PCS* ≤ 2.0 MJ/kg [d]	-
$A2_{fl}$	EN ISO 1182 [a2] or	ΔT ≤ 50 °C and Δm ≤ 50 % and t_f ≤ 20 s	-
	EN ISO 1716 and	*PCS* ≤ 3.0 MJ/kg [a2] and *PCS* ≤ 4.0 MJ/m² [b] and *PCS* ≤ 4.0 MJ/m² [c] and *PCS* ≤ 3.0 MJ/kg [d]	-
	EN ISO 9239-1 [e]	CHF ≥ 8.0 kW/m²	Smoke production [g]
B_{fl}	EN ISO 9239-1 [e] and	CHF ≥ 8.0 kW/m²	Smoke production [g]
	EN ISO 11925-2 [h]: Exposure = 15 s	Fs ≤ 150 mm within 20 s	-
C_{fl}	EN ISO 9239-1 [e] and	CHF ≥ 4.5 kW/m²	Smoke production [g]
	EN ISO 11925-2 [h]: Exposure = 15 s	Fs ≤ 150 mm within 20 s	-
D_{fl}	EN ISO 9239-1 [e] and	CHF ≥ 3.0 kW/m²	Smoke production [g]
	EN ISO 11925-2 [h]: Exposure = 15 s	Fs ≤ 150 mm within 20 s	-
E_{fl}	EN ISO 11925-2 [h]: Exposure = 15 s	Fs ≤ 150 mm within 20 s	-
F_{fl}	EN ISO 11925-2 [h]: Exposure = 15 s	Fs > 150 mm within 20 s	-

[a2] 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 ≤ 750 % 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.

Report produced with the Fire Testing Technology FRPSoft software

page 1

Flooring Radiant Panel Single Specimen Report

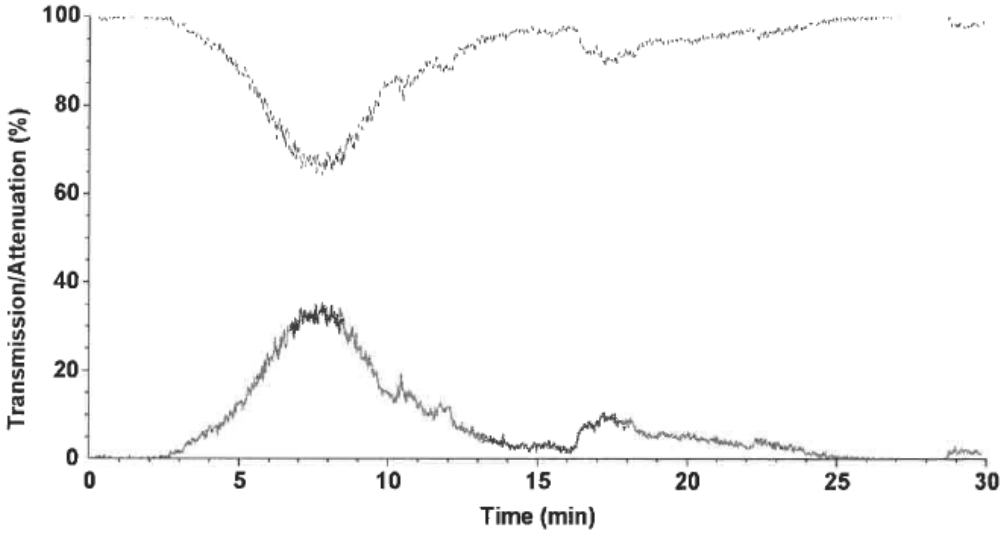
Standard	: EN ISO 9239-1:2010
Laboratory	: TÜV Rheinland Nederland B.V.
Sponsor	: 89223770
Date of test	: Apr. 30 2024
Specimen description	: MT24-223770.33
Test name	: # Prod 1
File name	: D:\FRPFILES\24040009.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT2.9A\CALIB\FLX24002.CSV
Thickness (mm)	: 22.1
Density (kg/m³)	: 700
Test duration	: 29 minutes 51 seconds (1791 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 06 seconds (126 s)
Time to flameout	: 29 minutes 50 seconds (1790 s)
Extent of burning (mm)	: 310
Critical flux at extinguishment (kW/m²)	: 7.44
HF-10 (kW/m²)	: 9.65
HF-20 (kW/m²)	: 7.83
HF-30 (kW/m²)	: Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm)	: 200
Flame spread at 20 minutes (mm)	: 290
Flame spread at 30 minutes (mm)	: Not measured
Peak light attenuation (%)	: 35.5
Time to peak light attenuation	: 7 minutes 45 seconds (465 s)
Total integrated smoke (%.min)	: 226.48
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.

Smoke Graph



Test name : # Prod 1
File name : D:\FRPFILES\24040009.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)	Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)
60	248	11.8	2.928	510	-	3.7	-
110	346	11.0	3.806	560	-	3.1	-
160	464	10.3	4.781	610	-	2.6	-
210	647	9.5	6.137	660	-	2.2	-
260	982	8.4	8.279	710	-	1.8	-
310	1387	7.4	10.314	760	-	1.6	-
360	-	6.3	-	810	-	1.5	-
410	-	5.3	-	860	-	1.3	-
460	-	4.4	-	910	-	1.2	-

Comments

Specimen extinguished naturally.

Report produced with the Fire Testing Technology FRPSoft software

page 1

Flooring Radiant Panel Single Specimen Report

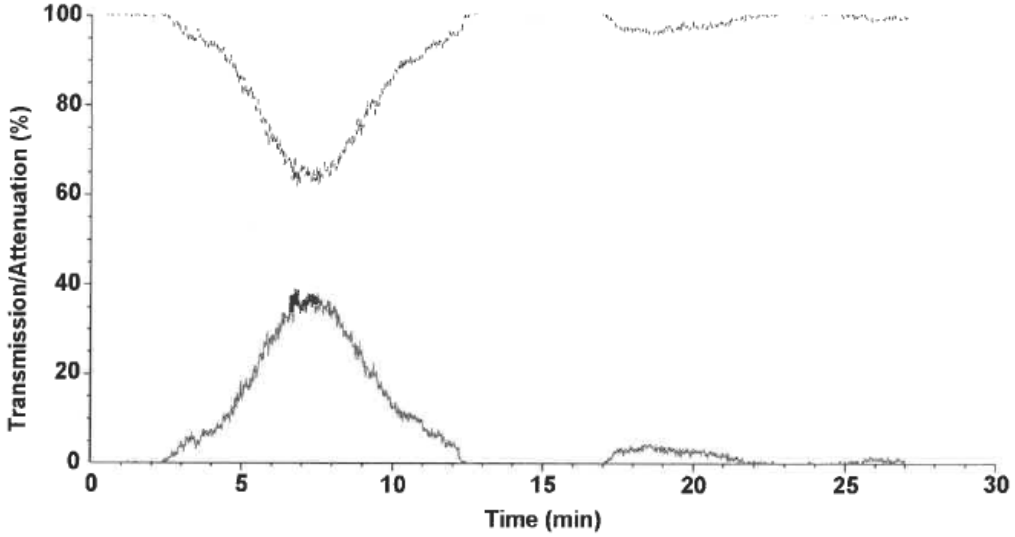
Standard	: EN ISO 9239-1:2010
Laboratory	: TÜV Rheinland Nederland B.V.
Sponsor	: 89223770
Date of test	: Apr. 30 2024
Specimen description	: MT24-223770.33
Test name	: # Cross 2
File name	: D:\FRPFILES\24040010.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT2.9A\CALIB\FLX24002.CSV
Thickness (mm)	: 22.1
Density (kg/m³)	: 700
Test duration	: 26 minutes 59 seconds (1619 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 09 seconds (129 s)
Time to flameout	: 26 minutes 57 seconds (1617 s)
Extent of burning (mm)	: 280
Critical flux at extinguishment (kW/m²)	: 8.03
HF-10 (kW/m²)	: 8.64
HF-20 (kW/m²)	: 8.03
HF-30 (kW/m²)	: Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm)	: 250
Flame spread at 20 minutes (mm)	: 280
Flame spread at 30 minutes (mm)	: Not measured
Peak light attenuation (%)	: 38.51
Time to peak light attenuation	: 6 minutes 47 seconds (407 s)
Total integrated smoke (%.min)	: 184.71
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.

Smoke Graph



Test name : # Cross 2
File name : D:\FRPFILES\24040010.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)	Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)
60	239	11.8	2.822	510	-	3.7	-
110	333	11.0	3.663	560	-	3.1	-
160	369	10.3	3.802	610	-	2.6	-
210	528	9.5	5.009	660	-	2.2	-
260	691	8.4	5.826	710	-	1.8	-
310	-	7.4	-	760	-	1.6	-
360	-	6.3	-	810	-	1.5	-
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.

Report produced with the Fire Testing Technology FRPSoft software

page 1

Flooring Radiant Panel Single Specimen Report

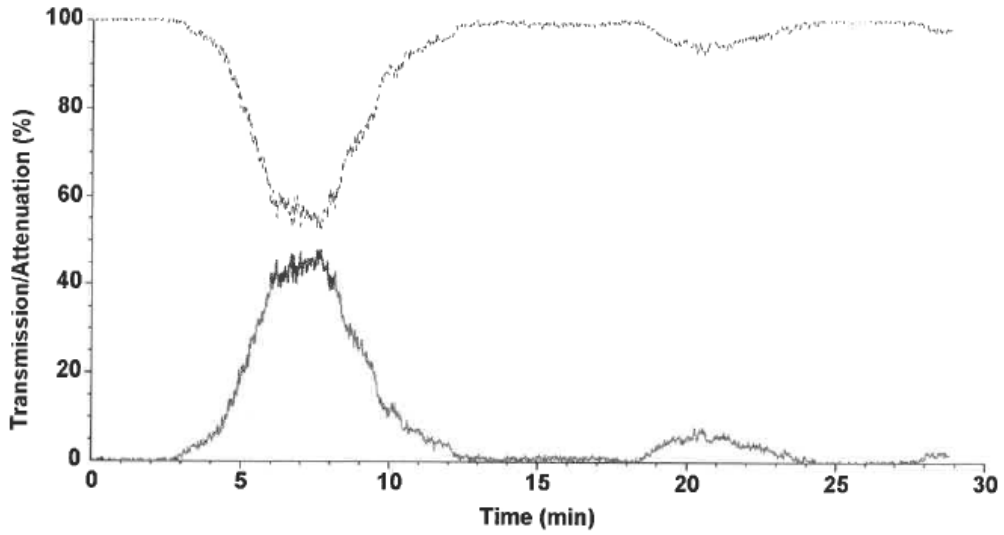
Standard	: EN ISO 9239-1:2010
Laboratory	: TÜV Rheinland Nederland B.V.
Sponsor	: 89223770
Date of test	: Apr. 30 2024
Specimen description	: MT24-223770.33
Test name	: # Prod 3
File name	: D:\FRPFILES\24040011.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT2.9A\CALIB\FLX24002.CSV
Thickness (mm)	: 22.1
Density (kg/m³)	: 700
Test duration	: 28 minutes 49 seconds (1729 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 07 seconds (127 s)
Time to flameout	: 28 minutes 47 seconds (1727 s)
Extent of burning (mm)	: 350
Critical flux at extinguishment (kW/m²)	: 6.55
HF-10 (kW/m²)	: 7.83
HF-20 (kW/m²)	: 6.55
HF-30 (kW/m²)	: Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm)	: 290
Flame spread at 20 minutes (mm)	: 350
Flame spread at 30 minutes (mm)	: Not measured
Peak light attenuation (%)	: 47.58
Time to peak light attenuation	: 7 minutes 31 seconds (451 s)
Total integrated smoke (%.min)	: 224.63
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.

Smoke Graph



Test name : # Prod 3
File name : D:\FRPFILES\24040011.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)	Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)
60	261	11.8	3.082	510	-	3.7	-
110	311	11.0	3.421	560	-	3.1	-
160	391	10.3	4.028	610	-	2.6	-
210	430	9.5	4.079	660	-	2.2	-
260	504	8.4	4.249	710	-	1.8	-
310	937	7.4	6.968	760	-	1.6	-
360	-	6.3	-	810	-	1.5	-
410	-	5.3	-	860	-	1.3	-
460	-	4.4	-	910	-	1.2	-

Comments

Specimen extinguished naturally.

Report produced with the Fire Testing Technology FRPSoft software

page 1

Flooring Radiant Panel Single Specimen Report

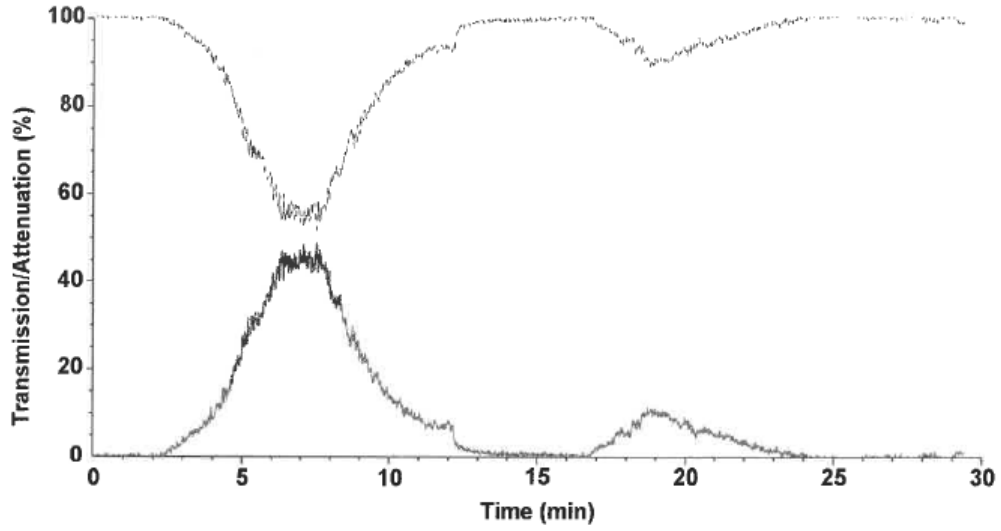
Standard	: EN ISO 9239-1:2010
Laboratory	: TÜV Rheinland Nederland B.V.
Sponsor	: 89223770
Date of test	: Apr. 30 2024
Specimen description	: MT24-223770.33
Test name	: # Prod 4
File name	: D:\FRPFILES\24040012.CSV
Test number in series	: 4
Flux calibration file name	: C:\FRPSOFT2.9A\CALIB\FLX24002.CSV
Thickness (mm)	: 22.1
Density (kg/m³)	: 700
Test duration	: 29 minutes 24 seconds (1764 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 22 seconds (1762 s)
Extent of burning (mm)	: 330
Critical flux at extinguishment (kW/m²)	: 6.99
HF-10 (kW/m²)	: 7.83
HF-20 (kW/m²)	: 6.99
HF-30 (kW/m²)	: Not calculated (test duration < 30 minutes)
Flame spread at 10 minutes (mm)	: 290
Flame spread at 20 minutes (mm)	: 330
Flame spread at 30 minutes (mm)	: Not measured
Peak light attenuation (%)	: 48.51
Time to peak light attenuation	: 7 minutes 31 seconds (451 s)
Total integrated smoke (%.min)	: 251
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.

Smoke Graph



Test name : # Prod 4
File name : D:\FRPFILES\24040012.CSV

Rake Results

Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)	Position (mm)	Time (s)	Flux (kW/m²)	Qsb (MJ/m²)
60	239	11.8	2.822	510	-	3.7	-
110	276	11.0	3.036	560	-	3.1	-
160	366	10.3	3.771	610	-	2.6	-
210	403	9.5	3.823	660	-	2.2	-
260	528	8.4	4.452	710	-	1.8	-
310	798	7.4	5.934	760	-	1.6	-
360	-	6.3	-	810	-	1.5	-
410	-	5.3	-	860	-	1.3	-
460	-	4.4	-	910	-	1.2	-

Comments

Specimen extinguished naturally.