

Test Report No. 19147B

Sponsor

Verduren
1098 Chestnut Bend
West Plains, MO 65775

Construction product and trade name

Cast floor Verduren

Nature of the tests

EN ISO 9239-1:2010 - Reaction to fire tests for floorings - Part 1:
Determination of the burning behaviour using a radiant heat source.

Summary of the results

Average critical flux (kW/m ²)	4,9
Average smoke attenuation (%.min)	105

PREPARED BY

APPROVED BY

This report consists of 12 pages, including 4 annexes

This document is the original version of this test report and is written in English.

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1. DESCRIPTION OF THE TEST METHOD

EN ISO 9239-1:2010 - Reaction to fire tests for floorings - Part 1: Determination of the burning behaviour using a radiant heat source.

There was no deviation from the specifications contained in the test standard.

2. IDENTIFICATION OF THE PRODUCT

Date of test samples arrival : 16/05/2018

Identification of the samples : Prod. Place Rhenen
Prod. Line Verduren
Prod. Date 15/02/2018
Identification within the quality system:
11576104

Sampling done by : The sponsor (Mr. Henk Kesteloo)

Sampling date : 19/03/2018

Name of the sponsor : Verduren
1098 Chestnut Bend
West Plains, MO 65775

Name of the manufacturer/supplier : Verduren
1098 Chestnut Bend
West Plains, MO 65775

Trade name : Verduren

Description of the tested product:

This description is based on information given by the sponsor.

	Nominal values (*)	Measured values (**)
Total product (see Figure 1)		
Type of product	The tested product is a liquid applied floor covering consisting of a primer (layer 1; DS 315), a natural cast floor (layer 2; Verduren) and a polyurethane top coat (layer 3; PU Protector).	
Manufacturer	Verduren	
Total thickness (mm)	2,3	2,85
Total surface weight (g/m ²) (dry)	19058 (including the fibre cement substrate) (**)	
Layer 1: Primer		
Type of product	Two component solvent free primer on the basis of synthetic resins	
Trade name	DS 315	
Manufacturer	Verduren	
Mixture ratio A-component (kg)/ B-component (kg)	2/1	
Solid content (% w/w)	100	
Density of the mixture (kg/m ³) (wet)	1100	
Fire retardants	No	
Colour of the mixture	Colourless, transparent	
Fixation onto the substrate		
<i>Fixing method</i>	Roller	
<i>Number of layers</i>	1	(***)
<i>Applied amount (g/m²) (wet)</i>	300	(***)
<i>Dried film thickness (mm)</i>	0,2	(***)

(*) Based on the information given by the sponsor.

(**) Values verified by the laboratory.

(***) Unverifiable by the laboratory.

	Nominal values (*)	Measured values (**)
Layer 2: Natural cast floor		
Type of product	Natural cast floor on the basis of resins, linseed oil, wood flour, cork, natural fillers and pigments	
Trade name	Verduren	
Manufacturer	Verduren	
Mixture ratio A-component (kg) / B-component (kg)	5,15 / 1	
Solid content (% w/w)	100	
Density of the mixture (kg/m ³) (wet)	1520	
Fire retardants	No	
Colour of the mixture	Beige / salmon pink	
Fixation onto the primer (layer 1)		
<i>Fixing method</i>	Trowel	
<i>Number of layers</i>	1	(***)
<i>Applied amount (g/m²) (wet)</i>	3000	(***)
<i>Dried film thickness (mm)</i>	2	2,85
Layer 3: Polyurethane top coat		
Type of product	Two component PU coating on the basis of polyurethane	
Trade name	TopCoat	
Manufacturer	Verduren	
Mixture ration coating (l) / hardener (l)	10/1	
Solid content (% w/w)	100	
Density of the mixture (kg/m ³) (wet)	1001	
Fire retardants	No	
Colour of the mixture	Transparent	
Fixation onto the cast floor (layer 2)		
<i>Fixing method</i>	Roller	
<i>Number of layers</i>	1	(***)
<i>Applied amount (g/m²) (wet)</i>	80	(***)
<i>Dried film thickness (mm)</i>	0,1	(***)

(*) Based on the information given by the sponsor.

(**) Values verified by the laboratory.

(***) Unverifiable by the laboratory.



Figure 1: Tested cast floor

MOUNTING & FIXING	
Substrate	The cast floor was applied by the sponsor onto a fibre cement board (substrate) with a thickness of 8 mm and a density of 1908 kg/m ³ , fully in accordance with EN 13238:2010.
Mounting	The whole assembly (substrate + cast floor) was tested as such, without any fixations.
Direction	Since there's no difference in production direction of the product (lengthwise vs. crosswise), direction is not considered a parameter.
Joint configuration	No joints were used.

Conditioning, according to EN 13238, § 4.2 to constant mass.

Start of conditioning : 16/05/2018
End of conditioning : 11/06/2018

3. CALIBRATION RESULTS

Latest calibration date : 11/06/2018
Calibration results : Annex 1

4. RESULTS AND OBSERVATIONS

Date of test : 11/06/2018

a) Test results

Flame spread as in function of time

Specimen number	1	2	3
Flame spread	Time when reached (s)		
50 mm	276	285	246
100 mm	363	402	339
150 mm	412	435	390
200 mm	502	549	447
250 mm	573	690	504
300 mm	618	777	669
350 mm	810	813	786
400 mm	1170	(1)	(1)
450 mm	1341		
500 mm	1440		
550 mm	(1)		
600 mm			
650 mm			
700 mm			
750 mm			

(1) Not reached

Other data

Specimen number	1	2	3	Averages
Flame spread after 10 min (mm)	290	220	280	263
Flame spread after 20 min (mm)	420	380	380	393
Flame spread after 30 min (mm)	510	380	380	423
Maximum flame spread (mm)	510	380	380	423
Self extinguishing time (s)	1731	1194	1059	1328
CHF (kW/m ²)	3,45	5,70	5,70	4,95
Extinguished by operator at 30 min (yes/no)	No	No	No	No
HF-10 (kW/m ²)	7,65	9,14	7,87	8,22
HF-20 (kW/m ²)	4,91	5,70	5,70	5,43
HF-30 (kW/m ²)	3,45	5,70	5,70	4,95
Total smoke attenuation at 30 min. (%.min)	162,66	94,61	56,44	104,57

(-) Not applicable

Graphs of smoke attenuation: see annexes 2 to 4

b) Observations

Specimen number	1	2	3
Transitory flaming (yes/no)	No	No	No
Melting (yes/no)	No	No	No
Blistering (yes/no)	Yes	No	No
Glowing combustion after extinction	No	No	No
Duration (s)	(-)	(-)	(-)
Location (distance from reference line) (mm)	(-)	(-)	(-)
Penetration of the flame through the substrate (yes/no)	No	No	No
Other observations	None	None	None

(-) Not applicable

c) Summary of the results

The test results relate to the behaviour of the test specimens of a 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.

The test results are only valid for the specimen of the product which has been tested.

The following test results were obtained in accordance with the standard EN ISO 9239-1:2010:

Average critical flux (kW/m ²)	4,9
Average smoke attenuation (%.min)	105

d) Uncertainty of measurement

Regarding the precision of the test method, at the present time we have insufficient information to make a considerate statement regarding the uncertainty of measurement. The uncertainty of test results for this test report is described in Annex B of the test standard.

As this annex only covers generic products and as we know at this moment that the uncertainty can be influenced by the nature of the product in the test, the values in Annex B can only give an indication of the actual uncertainty of the tests described in this report.

Calibration results

Calibration date: 11/06/2018

Heat flux distribution onto the calibration board:

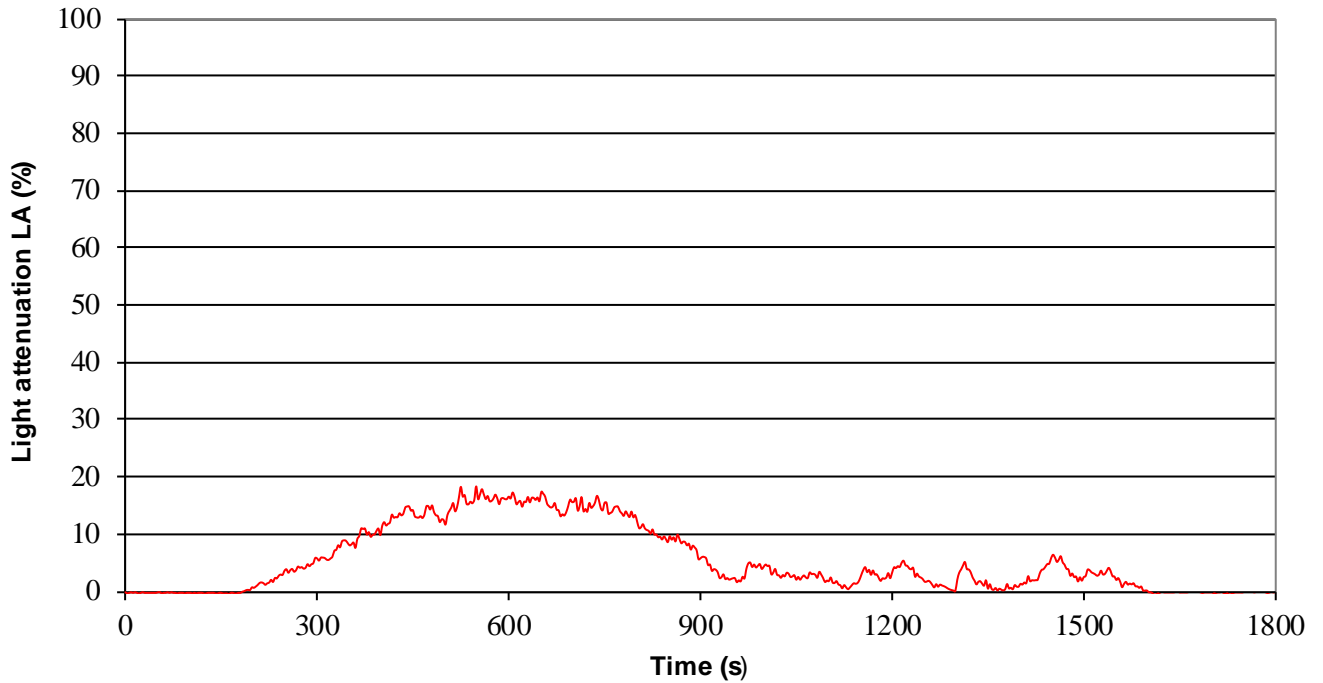
Distance to zero point of specimen (mm)	Measured heat flux (kW/m ²)	Required heat flux (kW/m ²)
110	10,8	10,9 ± 0,4
210	9,3	9,2 ± 0,4
310	7,2	7,1 ± 0,4
410	5,1	5,1 ± 0,2
510	3,5	3,5 ± 0,2
610	2,4	2,5 ± 0,2
710	1,7	1,8 ± 0,2
810	1,2	1,4 ± 0,2
910	1,0	1,1 ± 0,2

Black body temperature of the radiant panel : 554,03 °C

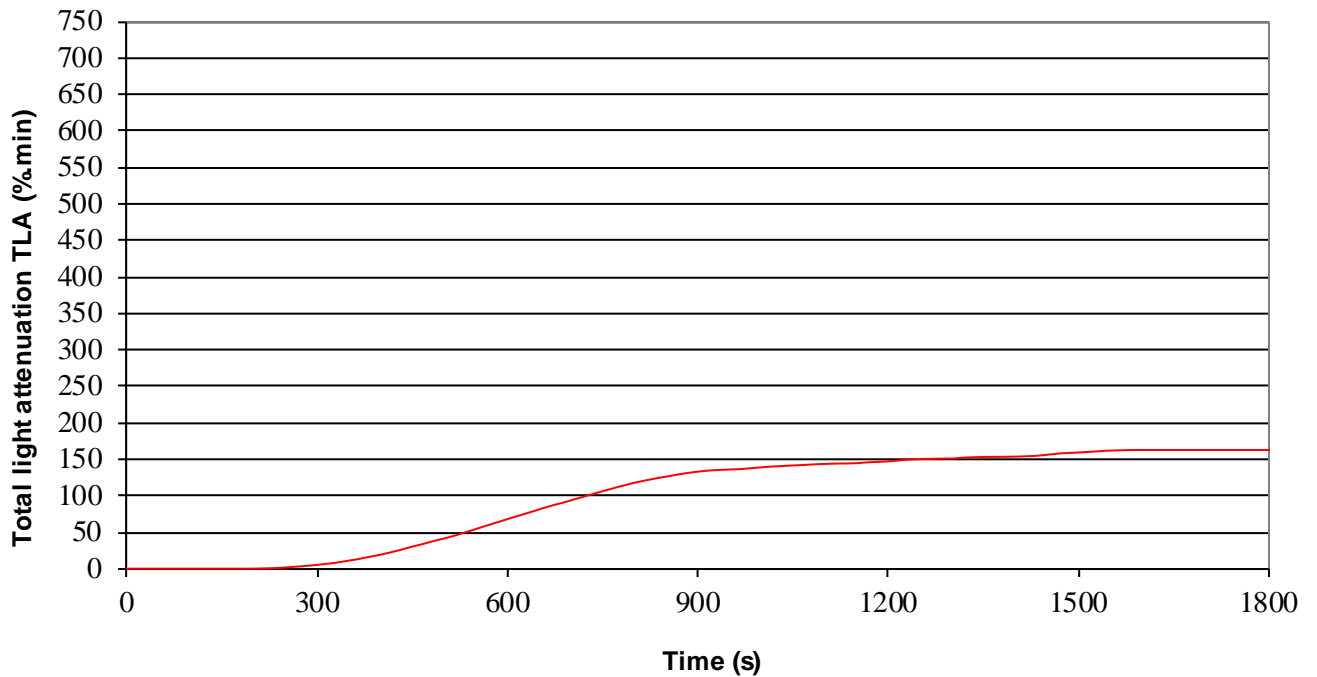
Temperature of the chamber : 121,82 °C

Graphs of smoke production for specimen No. 1

Light attenuation (%)

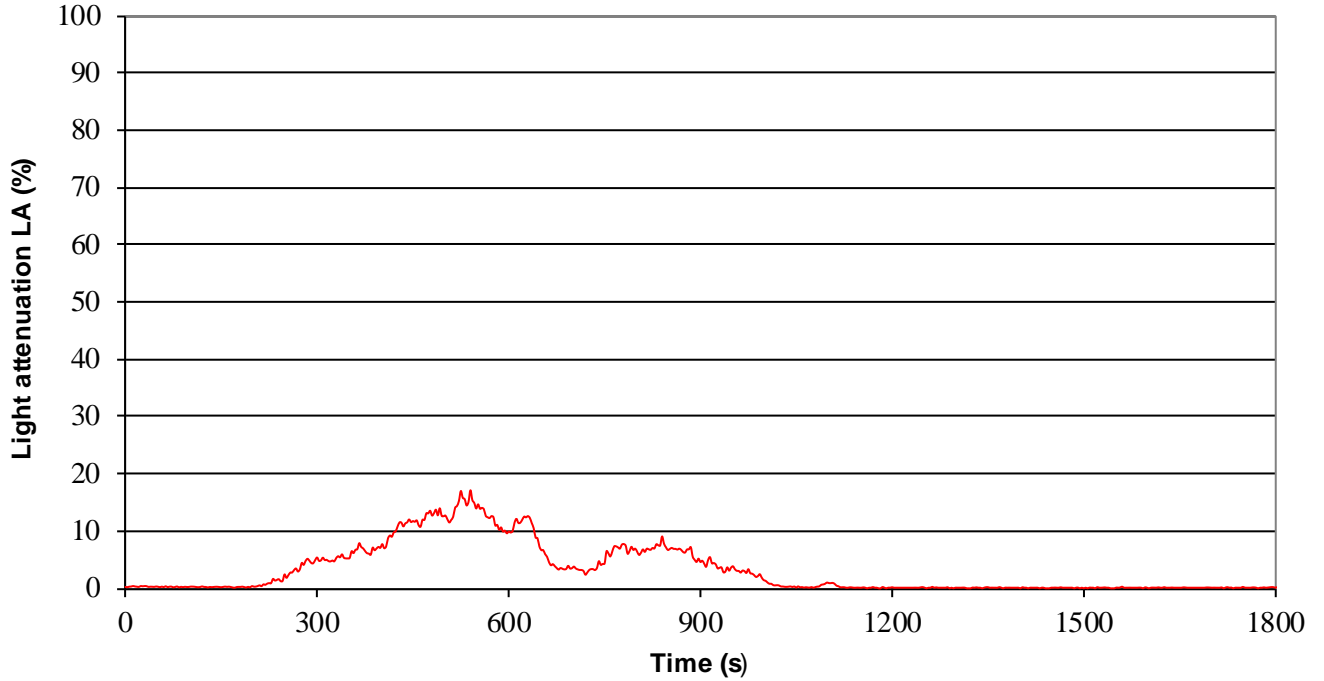


Total light attenuation (%.min)

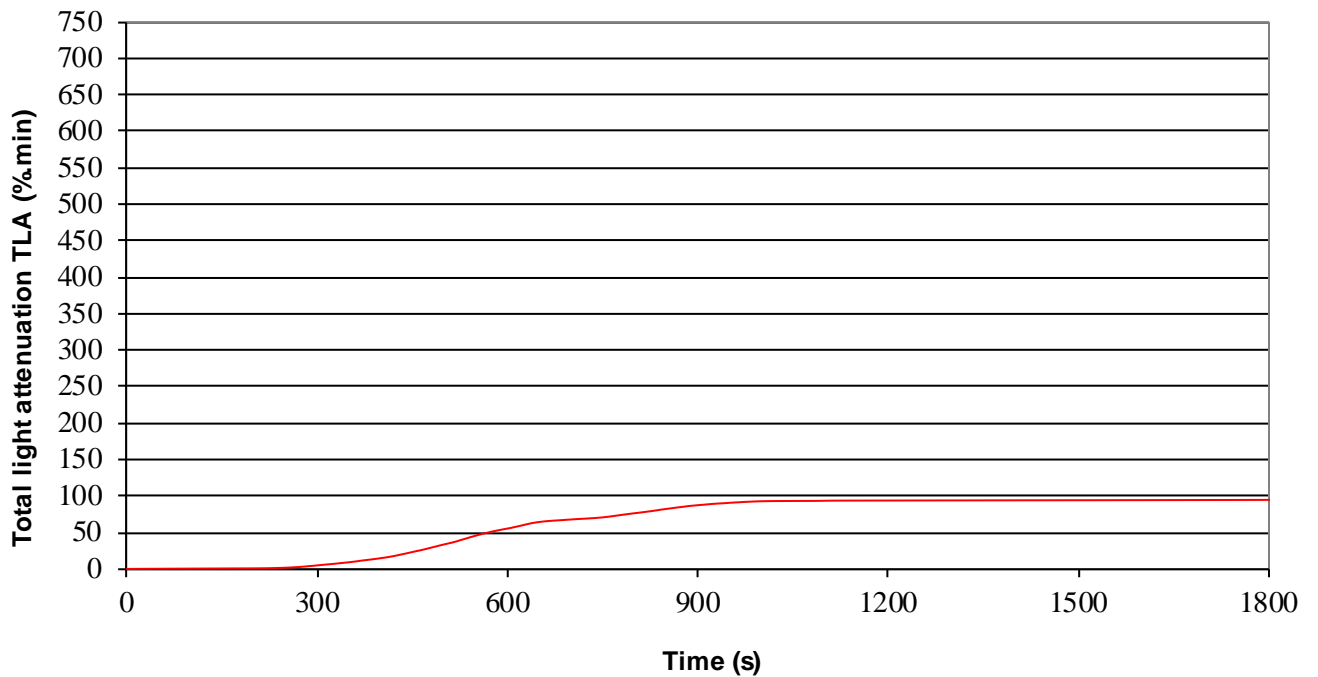


Graph of smoke attenuation for specimen No. 2

Light attenuation (%)

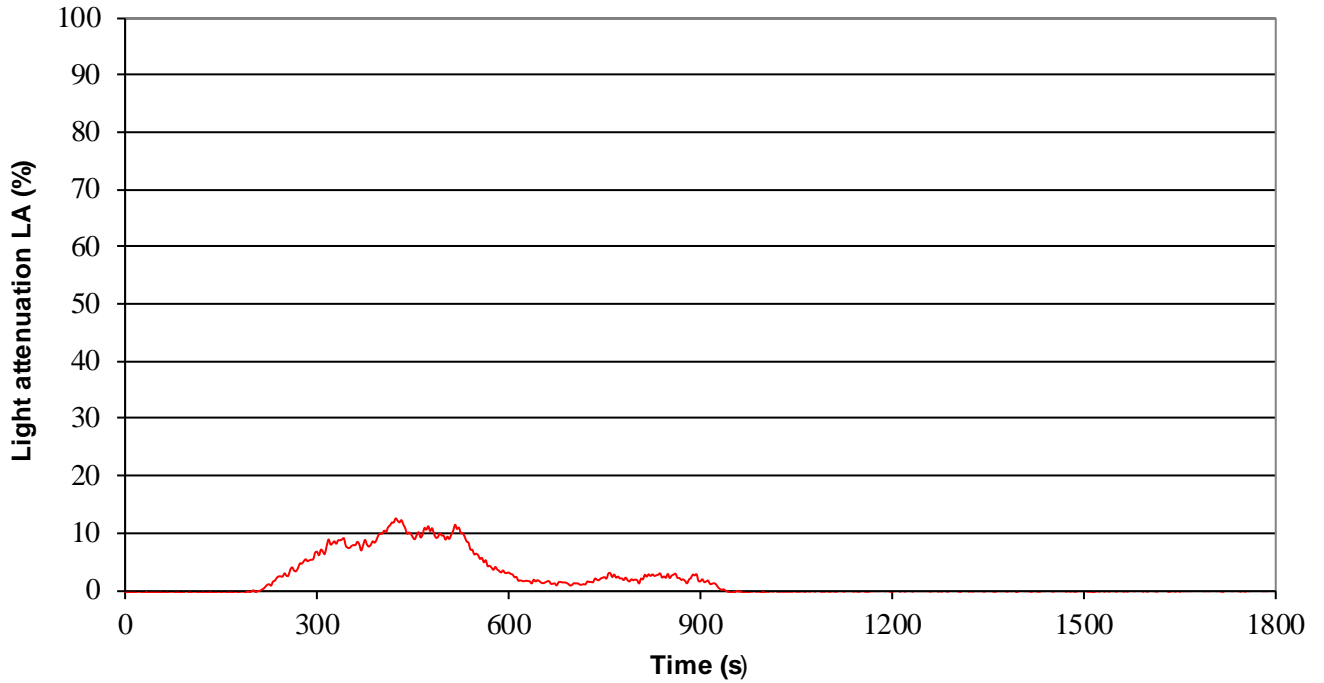


Total light attenuation (%.min)



Graph of smoke attenuation for specimen No. 3

Light attenuation (%)



Total light attenuation (%.min)

