REPORT
issued by an Accredited Testing Laboratory

Contact person
Johan Post
Fire Technology
+46 10 516 58 45
Johan.Post@sp.se

Date 2013-04-30
Reference 3P02236-4

SWEDAC ACKREDITERING 1002 ISO/IEC 17025

Ide Trading Sverige AB
Askims Verkstadsväg 1
436 34 ASKIM
Sweden

Smoke generation according to ISO 5659-2 with additional gas analysis

(1 appendix)

Introduction

SP has by request of Ide Trading Sverige AB performed a fire test according to ISO 5659-2 according to FTP Code chapter 1, Annex 1, Part 2 section 2.6. The test is for informatory purpose.

Product

According to the client:

Floor covering called "Swedmarine Vinyl Locking 4.0", consisting of polymer, plasticizer, stabilizer, $CaCo_3$, fire retardant and smoke suppression agent. The product has a nominal area weight of 8.0 kg/m^2 and a nominal thickness of 4.0 mm. The product has a dark brown colour.

Manufacturer

Idé Trading Hong Kong LTD, Hong Kong, China.

Sampling

The sample was delivered by the client. It is not known to SP Fire Technology if the product received is representative of the mean production characteristics.

The sample was received March 8, 2013 at SP Fire Technology.

Test procedure

The product was tested in three different modes according to ISO 5659-2:1994:

- Three tests were performed at an irradiance of 25 kW/m^2 in the absence of pilot flame.
- Three tests were performed at an irradiance of 25 kW/m^2 in the presence of pilot flame.

Additional to the test method, FTIR gas analysis was performed in each test mode to indicate the concentration of certain gas species specified in IMO FTP Code Resolution MSC. 61(67), chapter 1, Annex 1, Part 2.

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Tests results

The test results are given in appendix 1.

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

Criteria

According to IMO FTP Code Resolution MSC. 61(67), chapter 1, Annex 1, Part 2 section 2.6 materials used as floor coverings shall not have a Dm exceeding 500 in any test mode. The gas concentration measured at each test condition shall not exceed the following limits: CO 1450 ppm, HCl 600 ppm, HBr 600 ppm, HF 600 ppm, HCN 140 ppm, NO_x 350 ppm and SO_2 200* ppm.

* Gas concentration criteria 200 ppm, SO_2 as adopted by the 47th meeting, Fire protection committee (FP 47), London 2003-02-10--14.

Deviation from standard

Six tests were carried out, instead of the three in each mode stipulated in the standard.

Note

This test does not comply with the standard as far as number of tests is concerned. It can therefore not be used as the sole basis for a classification or an approval.

SP Technical Research Institute of Sweden
Fire Technology - Fire Dynamics

Performed by

Johan Post

Examined by

Per Thureson

Appendix

1 Test results

Appendix 1

Test Results - ISO 5659-2 :1994

Product

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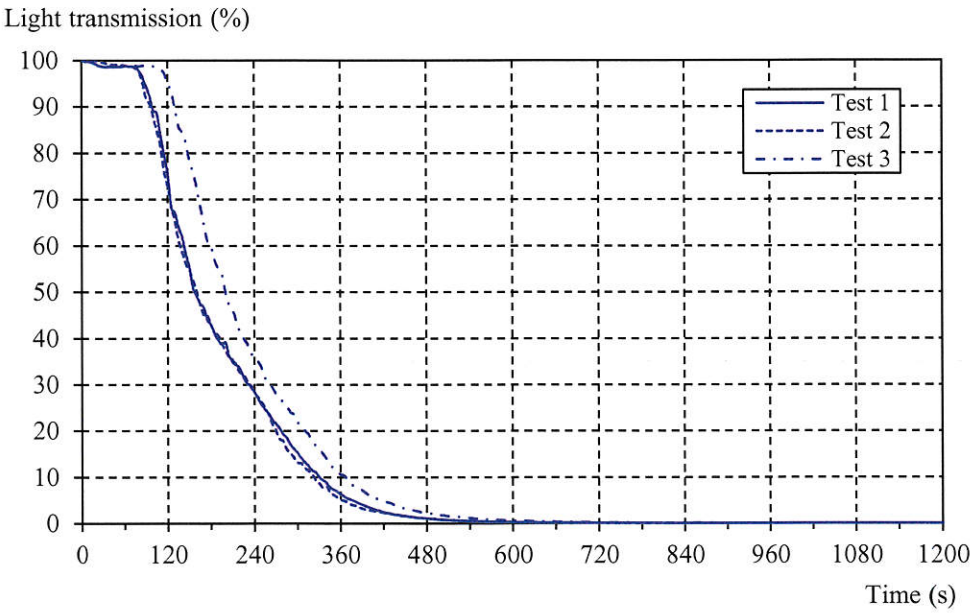
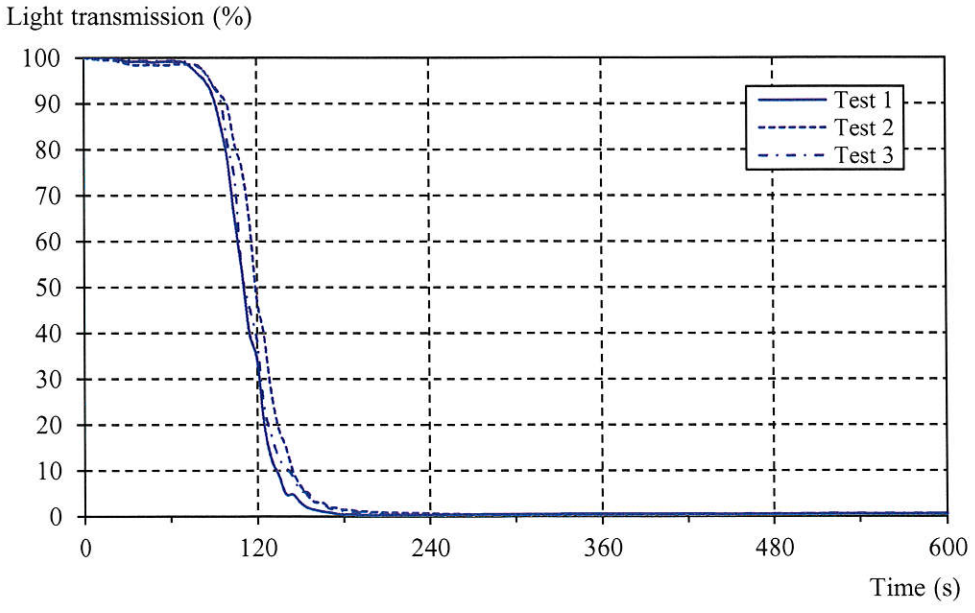
Light Transmission – Irradiance of 25 kW/m^2 in the absence of pilot flame



Light Transmission – Irradiance of 25 kW/m^2 in the presence of pilot flame



Appendix 1

Smoke results

Mode	Irradiance 25kW/m², Non-flaming exposure			
Test no	1	2	3	Mean
$D_{s,max}$	491	496	494	494
D_s10	340	341	293	324
D_c	467	470	466	
Duration of test, s	1200	1200	1200	

Mode	Irradiance 25kW/m², Flaming exposure			
Test no	1	2	3	Mean
$D_{s,max}$	342	338	339	340
D_s10	297	300	292	296
D_c	304	299	302	
Duration of test, s	605	605	600	

Note

None of the specimens tested in mode 1 (irradiance of 25 kW/m^2 in the absence of pilot flame) ignited.

One of the specimens tested in mode 2 (irradiance of 25 kW/m^2 in the presence of pilot flame ignited.
In test no 4 the sample ignited at 63 seconds and extinguished at 600 seconds.
In test no 5 the sample ignited at 71 seconds and extinguished at 600 seconds.
In test no 6 the sample ignited at 66 seconds and extinguished at 600 seconds.

Table of sign

D_S Specific optical density, calculated as follows:

$$D_S = 132 \log \frac{100}{T}$$ where T = percent light transmittance.

$D_{S,max}$ Maximum specific optical density.

D_{S10} Specific optical density at 10 minutes.

D_c Specific optical density correction factor for the smoke absorbed on the glass windows of the optical system.

Appendix 1

Gas analysis

The following gas concentrations were measured in the test chamber. The gas samples were taken from the geometrical centre of the test chamber. The concentrations of the different gas species were measured with FTIR gas analysis.

Gas species	Measured concentration during non-flaming exposure (irradiance of 25 kW/m^2). [ppm]		Measured concentration during flaming exposure (irradiance of 25 kW/m^2). [ppm]		Measured concentration during non-flaming exposure (irradiance of 50 kW/m^2). [ppm]	
Test no:	Test 2	Test 3	Test 2	Test 3	Test 2	Test 3
CO	306	178	350	423		-
HCN	4	< 2	< 2	< 2		-
HCl	532	348	661	747		-
HBr	< 10	< 10	< 10	< 10		-
HF	< 5	< 5	< 5	< 5		-
SO_2	< 10	< 10	< 10	< 10		-
NO_X	< 20	< 20	< 20	< 20		-

Measured data

Thickness 4.1 – 4.5 mm.

Area weight 7.8 – 8.2 kg/m^2.

Conditioning

Temperature (23 ± 2) °C.

Relative humidity (50 ± 5) %.

Date of test

April 22 and 23, 2013.