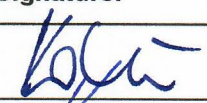
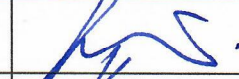




TEST REPORT

Test Report No.:	0171-19-F		
Title:	Fire Safety Test according IMO 2010 FTP Code part 2		
Client: Address:	South regional center of examination of fire-prention in construction (SRCEFSC Ltd) 344002, Rostov-on-Don, Russia		
Contract No.: Purchase Order No.:	0147-19		
Date of issue:	13. 11. 2019		
Test was carried out at:	CZ testing institute s.r.o. Sokolovská 637, 741 01 Nový Jičín, Czech Republic		
	Name:	Job description:	Signature:
Measured and prepared by:	Jiří Kokeš	Test Technician	
Checked by:	Daniel Kudláček	Head of Test Laboratory	
Approved by:	Daniel Kudláček	Head of Test Laboratory	
Number of Pages:	8	Stamp:	 CZ testing institute s.r.o. Sokolovská 637, 741 01 Nový Jičín IČ: 05222851 DIČ: CZ05222851
Number of Attachments:	1		

Declaration: The test results relate only to test samples and do not replace any other documents which may be required by the relevant state authorities in accordance with a specific legislation and do not replace the Certificate of Conformity within the meaning of §13 of the Act. No.: 22/1997, Coll.

This report may not be copied in full or in part without the written approval of the Head of Test Laboratory, CZ testing institute s.r.o.

CONTENTS

1 TEST OBJECTIVE	3
2 SCOPE AND SPECIFICATION OF TESTS	3
3 TESTED ITEM	3
3.1 Sample description	3
3.2 Sample identification and date of sample delivery	3
3.3 Sample preparation	3
4 TESTING METHODS AND PROCEDURE	3
4.1 Testing methods used	3
5 TEST DIAGRAM	3
6 COURSE OF TEST AND MEASURED RESULTS	4
6.1 Test methodology in accordance with ČSN EN ISO 5659-2: 25 kW/m ² / ISO 19702 without pilot flame (IMO FTP 2010 Appendix 2)	4
6.1.1 Measured and calculated values	4
6.2 Test methodology in accordance with ČSN EN ISO 5659-2: 25 kW/m ² / ISO 19702 with pilot flame (IMO FTP 2010 Appendix 2)	5
6.2.1 Measured and calculated values	5
6.3 Test methodology in accordance with ČSN EN ISO 5659-2: 50 kW/m ² / ISO 19702 without pilot flame (IMO FTP 2010 Appendix 2)	6
6.3.1 Measured and calculated values	6
7 CONCLUSION	7
8 ATTACHMENTS TO THE TEST REPORT	8

1 TEST OBJECTIVE

Carry out fire protection tests.

2 SCOPE AND SPECIFICATION OF TESTS

Carry out tests in accordance with IMO 2010 FTP Code part 2 standard.

3 TESTED ITEM

Test supplier is responsible for correct samples, their technical conditions and the compliance with documentation delivered. The samples were delivered by the ordering party.

3.1 Sample description

Trade name	2k epoxy mixture for self-leveling floor Alfapol EP-2TG with layer thickness 1,5 mm (20.16.40-001-82166262) without substrate Manufacturer "ALFAPOL Ltd" Pushkin, Saint-Petersburg, Russia, 196600
Sample marking	19/0173
Sample composition and colour	2k epoxy mixture for self-leveling floor Alfapol EP-2TG with layer thickness 1,5 mm (20.16.40-001-82166262), grey colour
Tested side	With rough surface

3.2 Sample identification and date of sample delivery

19/0173

Date of sample delivery: 31. 10. 2019

Test date: 12. 11. 2019

3.3 Sample preparation

Sample conditioning to the identical weight according to IMO FTP 2010 appendix 2, paragraph 4.5.

4 TESTING METHODS AND PROCEDURE

4.1 Testing methods used

M15.18 (ČSN EN ISO 5659-2) – Determination of optical density by a single-chamber test using the photometric method

5 TEST DIAGRAM

Not defined

6 COURSE OF TEST AND MEASURED RESULTS

6.1 Test methodology in accordance with ČSN EN ISO 5659-2: 25 kW/m² / ISO 19702 without pilot flame (IMO FTP 2010 Appendix 2)

6.1.1 Measured and calculated values

Measured values of smoke generation						
Name of measured quantity	Unit	Specimen			Average	Standard deviation
		A2/1	A2/2	A2/3		
Mass of specimen	g	20,8	21,0	19,5	20,4	0,8
Sample dimensions	mm	(75x75)	(75x75)	(75x75)	(75x75)	0
Specimen thickness	mm	2,7	2,6	2,6	2,6	0
Ignition time - t_z	s	(-)	(-)	(-)	(-)	(-)
Extinction time	s	(-)	(-)	(-)	(-)	(-)
Duration of the test	s	920	1080	965	988	83
Maximum of specific optical density - D_s max	(-)	166,0	224,6	266,8	219,1	50,6
Time of arrival of the maximum of - D_s max	min	660	755	760	725	56

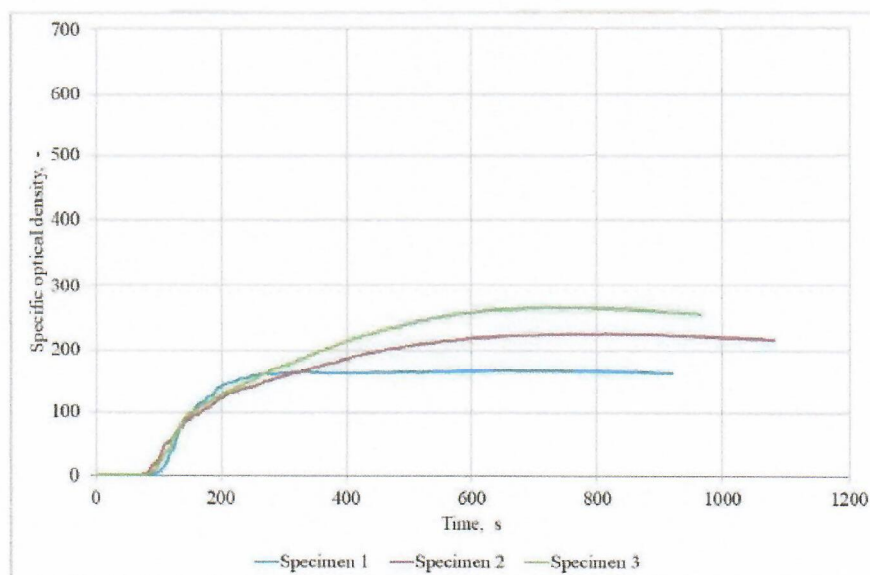


Figure 1 – Specific optical density in the time

Concentration of toxic products					
Toxic component of burning products	Specimen			Average	Standard deviation
	A2/1	A2/2	A2/3		
	ppm				
CO	25	52	84	54	30
NO _x	0	0	0	0	0
SO ₂	0	0	4	1	2
HCN	0	0	0	0	0
HCl	0	0	47	16	27
HBr	0	0	0	0	0
HF	1	0	0	0	1

Observations: None

6.2 Test methodology in accordance with ČSN EN ISO 5659-2: 25 kW/m² / ISO 19702 with pilot flame (IMO FTP 2010 Appendix 2)

6.2.1 Measured and calculated values

Measured values of smoke generation						
Name of measured quantity	Unit	Specimen			Average	Standard deviation
		A2/4	A2/5	A2/6		
Mass of specimen	g	21,1	20,7	20,3	20,7	0,4
Sample dimensions	mm	(75x75)	(75x75)	(75x75)	(75x75)	0
Specimen thickness	mm	2,7	2,6	2,6	2,6	0,1
Ignition time - t ₂	s	29	34	32	32	3
Extinction time	s	185	176	274	212	54
Duration of the test	s	820	610	610	680	121
Maximum of specific optical density – D _{s,max}	(-)	117,1	110,3	118,0	115,1	4,2
Time of arrival of the maximum of – D _{s,max}	min	180	185	205	190	13

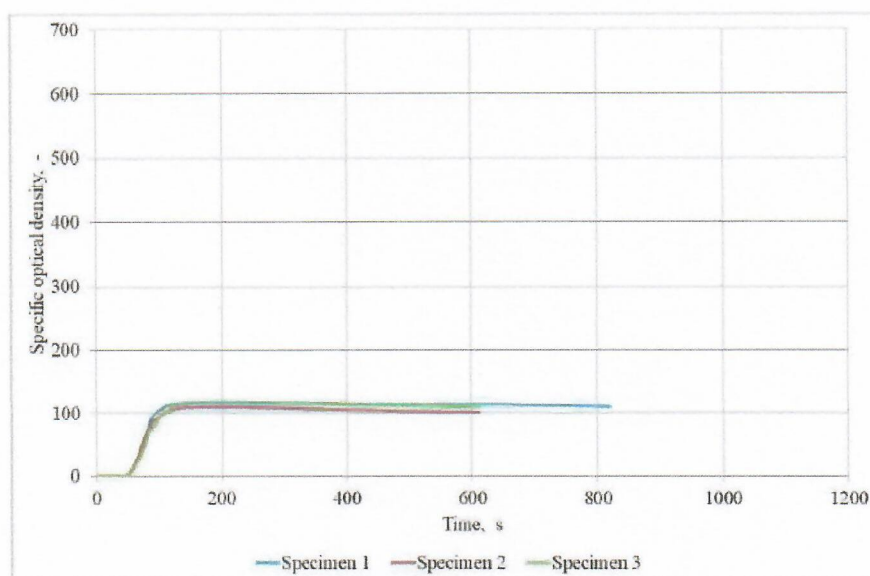


Figure 2 – Specific optical density in the time

Concentration of toxic products					
Toxic component of burning products	Specimen			Average	Standard deviation
	A2/4	A2/5	A2/6		
	ppm				
CO	110	87	122	106	18
NO _x	20	20	21	20	1
SO ₂	0	0	0	0	0
HCN	2	3	0	2	2
HCl	0	0	0	0	0
HBr	0	0	0	0	0
HF	0	0	0	0	0

Observations: None

6.3 Test methodology in accordance with ČSN EN ISO 5659-2: 50 kW/m² / ISO 19702 without pilot flame (IMO FTP 2010 Appendix 2)

6.3.1 Measured and calculated values

Measured values of smoke generation						
Name of measured quantity	Unit	Specimen			Average	Standard deviation
		A2/7	A2/8	A2/9		
Mass of specimen	g	18,8	19,0	22,7	20,1	2,2
Sample dimensions	mm	(75x75)	(75x75)	(75x75)	(75x75)	0
Specimen thickness	mm	2,6	2,2	2,8	2,5	0,3
Ignition time - t _z	s	35	21	18	25	9
Extinction time	s	325	(-)	446	386	86
Duration of the test	s	605	520	525	550	48
Maximum of specific optical density – D _{s,max}	(-)	195,3	205,9	239,6	213,6	23,1
Time of arrival of the maximum of – D _{s,max}	min	370	430	410	403	31

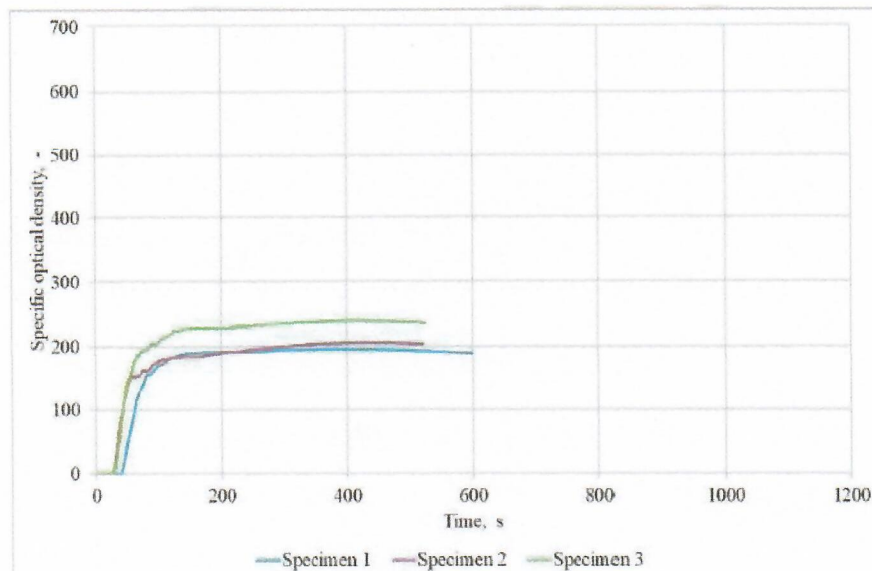


Figure 3 – Specific optical density in the time

Concentration of toxic products					
Toxic component of burning products	Specimen			Average	Standard deviation
	A2/7	A2/8	A2/9		
	ppm				
CO	284	345	440	356	79
NO _x	23	3	1	9	12
SO ₂	0	0	0	0	0
HCN	17	26	32	25	8
HCl	0	0	0	0	0
HBr	0	0	0	0	0
HF	0	0	0	0	0

Observations: None

7 CONCLUSION

Measured values of smoke generation					
Name of measured quantity	Test conditions			Maximum value	Standard deviation
	25 kW/m ² without pilot flame	25 kW/m ² without pilot flame	50 kW/m ² with pilot flame		
Average of maximum of specific optical density - D _m	219,1	115,1	213,6	219,1	(-)

An average (D_m) of the maximum specific optical density of smoke (D_s max) of three tests at each test condition in paragraph 8.8.1 of appendix 1 shall be calculated:

1. for materials used as surface of bulkheads, linings or ceilings, the D_m shall not exceed 200 in any test condition.
2. for materials used as primary deck coverings, the D_m shall not exceed 400 in any test condition;
3. for materials used as floor coverings, the D_m shall not exceed 500 in any test condition; and
4. for plastic pipes, the D_m shall not exceed 400 in any test condition.

Concentration of toxic products					
Toxic component of burning products	Test conditions			Maximum value	Standard deviation
	25 kW/m ² without pilot flame	25 kW/m ² without pilot flame	50 kW/m ² with pilot flame		
	Average volumetric concentrations				
	ppm				(-)
CO	54	106	356	356	0,25
NO _x	0	20	9	20	0,06
SO ₂	1	0	0	1	0,01
HCN	0	2	25	25	0,18
HCl	16	0	0	16	(-)
HBr	0	0	0	0	0
HF	0	0	0	0	0

The average value of the maximum value of the gas concentration measured at each test condition of paragraph 8.8.1 of appendix 1 shall not exceed the following limits: CO 1,450 ppm HBr 600 ppm, HCl 600 ppm HCN 140 ppm, HF 600 ppm SO₂ 120 ppm (200 ppm for floor coverings), NO_x 350 ppm

Evaluation of optical density of smoke for deck covering and floor covering					
Name of measured quantity	Test conditions			Maximum value	Criteria
	25 kW/m ² without pilot flame	25 kW/m ² without pilot flame	50 kW/m ² with pilot flame		
Average of maximum of specific optical density - D _m	219,1	115,1	213,6	219,1	<400

Evaluation of concentration of toxic products for deck covering and floor covering					
Toxic component of burning products	Test conditions			Maximum value	Criteria
	25 kW/m2 without pilot flame	25 kW/m2 without pilot flame	50 kW/m2 with pilot flame		
	Average volumetric concentrations				
	ppm				(-)
CO	54	106	356	356	1450
NO _x	0	20	9	20	350
SO ₂	1	0	0	1	120
HCN	0	2	25	25	140
HCl	16	0	0	16	600
HBr	0	0	0	0	600
HF	0	0	0	0	600

The tested product fulfils classification criteria of paragraph 2.4 IMO 2010 FTP Code part 2 for materials used as primary deck coverings and floor coverings.

Any unforeseen events or deviations from the set procedure: None

In evaluation of the test results shared risk was taken into account and the uncertainty was not considered.

The test results relate to the behaviour of the 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 was carried out in accordance with the current test methods and the Client's contractual requirements.

Appeal may be filled against test results within 15 days of the Test Report receipt in writing or electronically (via email) to the Head of Test Laboratory.

----- END OF REPORT -----

8 ATTACHMENTS TO THE TEST REPORT

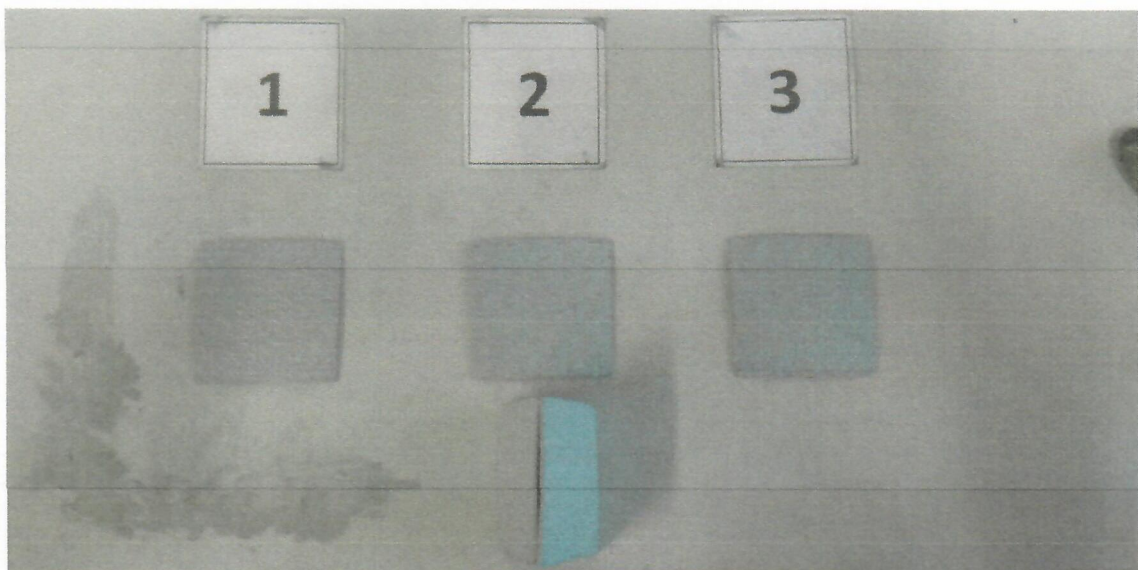


Figure 4 – Samples