Testing laboratory No. 1709, ČIA accredited in accordance with ČSN EN ISO/IEC 17025:2018

L 1709

TEST REPORT

Test Report No.:	0238-20-F
Title:	Fire protection test in accordance with ČSN EN 45545-2+A1 for set of requirements R1, R7 and R17
Client: **Address:**	Izolex Bratislava, a.s. Agátova 22, 844 03, Bratislava Slovakia
Contract No.: **Purchase Order No.:**	0201-20
Date of issue:	5. 11. 2020
Test was carried out at:	CZ testing institute s.r.o. Sokolovská 637, 741 01 Nový Jičín

	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:	9	**Stamp:**	
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.

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CONTENT

CZ testing institute s.r.o. – Testing laboratory
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1 OBJECTIVE

Carry out fire protection tests.

2 SCOPE AND TEST SPECIFICATIONS

Carry out tests in accordance with the set of R1, R7 and R17 requirements of the ČSN EN 45545-2+A1 standard.

3 TEST SAMPLE

The Client was fully responsible, that by the Client supplied test samples were correct, for their technical condition and compliance with provided documentation.

The laboratory is not responsible for informations provided by the customer which can influence validity of the results.

3.1 Description – informations provided by customer

Trade name	Aralamino with self-adhesive layer 9 (±2) mm
Description	**20/0215**
Sample composition and colour	Al-Aralamino with self-adhesive layer 9 (±2) mm Composition – Aluminium foil, glass fiber, self-adhesive layer
Tested (exposed) side	Aluminium foil

3.2 Sample ID

Ref No. 20/0215

Supplied on: 14th of October 2020

3.3 Sample preparation

Conditioning samples to have identical weight.

4 TEST METHODOLOGY AND PROCEDURE

4.1 Test methodology

ČSN EN ISO 5659-2

ISO 5660-1

ISO 5658-2

TÚPO Methodology No. 01-09, Procedure B – Tests carried out in the sub-contractor's accredited laboratory; testing laboratory No. 1011.2

5 TEST DIAGRAM

Not specified

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6 DESCRIPTION OF TESTS AND RESULTS

6.1 Test methodology in accordance with ČSN EN ISO 5659-2: 50 kW/m²

Test date: 4. 11. 2020

6.1.1 Test equipment settings

Usage of pilot flame:	NO
Usage of wire mesh:	NO
Radiated power output:	50 kW/m2
Sample attachment:	25 mm from heating coil

6.1.2 Test conditions

Temperature: 22 °C to 22,5 °C / Relative humidity: 46 % to 48 %

6.1.3 Measured and calculated values

Measured values			
	Sample 1	Sample 2	Sample 3
Sample thickness [mm]	10,2	10,1	10,2
Test duration [s]	600	600	600
Intensity 0% [lx]	0	0	0
Intensity 100% [lx]	529	543	547
Specific optical density Ds(4)	0,1	0,1	0,1
Specific optical density Ds(10)	1,3	1,1	1,5
Maximum optical density Ds(max)	1,3	1,1	1,5
Cumulative smoke density VOF(4)	0,1	0,2	0,1

Results	
	Average
Specific optical density Ds(4)	0,1
Specific optical density Ds(10)	1,3
Maximum optical density Ds(max)	1,3
Cumulative smoke density VOF(4)	0,1

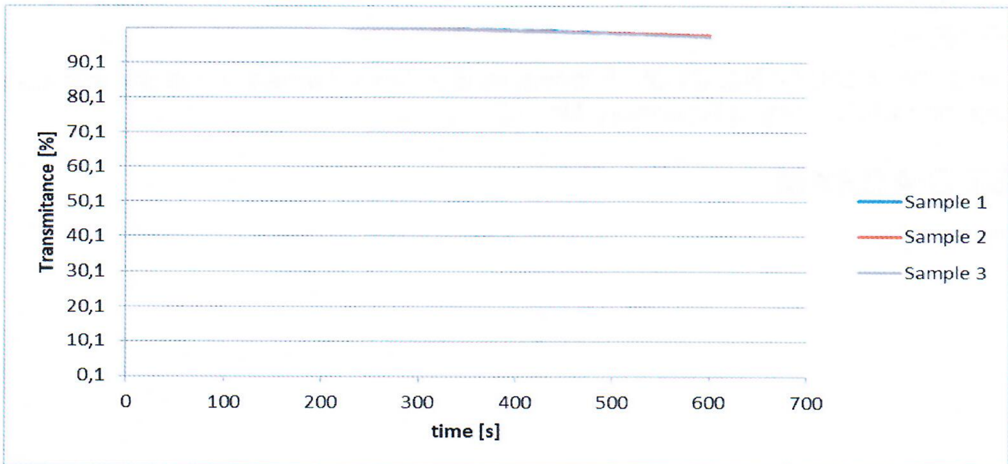

Figure 1 – Graph of light transmission during testing

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6.2 Test methodology in accordance with ČSN EN ISO 5659-2: 50 kW/m²*

*Test results were received from accredited sub-contractor; testing laboratory No. 1011.2; Report No 287-2020.

6.2.1 Test equipment settings

Usage of pilot flame: NO
Usage of wire mesh: NO
Radiated power output: 50 kW/m²

6.2.2 Measured and calculated values

Results	
Variable (parameter)	**Value**
Conventional index of toxicity CIT_G (4 min)	0,37
Conventional index of toxicity CIT_G (8 min)	0,37

6.3 Test methodology in accordance with ISO 5660-1: 50 kW/m²

Test date: 3. 11. 2020

Sample attachment – 25 mm from heating coil

6.3.1 Test equipment settings

Usage of wire mesh: NO
Radiated power output: 50 kW/m²
C factor: 0,04394

6.3.2 Test conditions

Temperature: 21,5 °C to 22 °C / Relative humidity: 48 % to 50 %

6.3.3 Measured and calculated values

Testing of samples				
	Sample 1	**Sample 2**	**Sample 3**	**Average**
Sample total thickness [mm]	10,2	10	10,2	10,2
Sample weight [g]	29,4	27,6	23,9	27
Separate flame burning od [s]	(-)	(-)	(-)	(-)
Total heat released from the sample [MJ/m²]	0,0	≤1,1	≤0,6	≤0,6
Weight after testing m_f [g]	27,9	26,6	23,5	26,0
MARHE [kW/m²]	0,2	2,7	0,9	1,3

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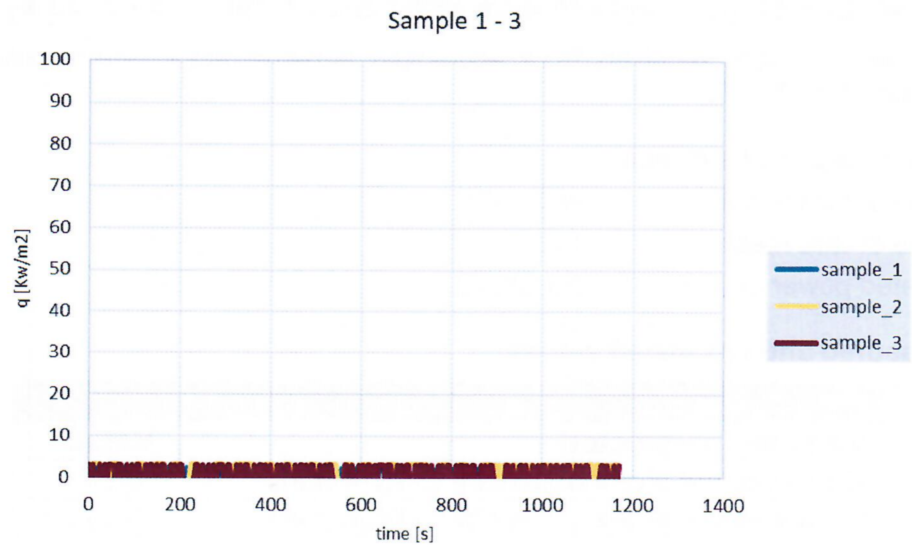

Figure 2 – Heat release rate for Samples 1 to 3

6.4 Test methodology in accordance with ISO 5658-2

Test date: 27. 10. 2020

6.4.1 Test equipment settings

Gas: Propane

6.4.2 Test conditions

Temperature: 20 °C to 21 °C / Relative humidity: 46 % to 48 %

Testing of samples				
	Sample 1	**Sample 2**	**Sample 3**	**Average**
Sample thickness [mm]	10	10	10	10
Separate flame burning [s]	(-)	(-)	(-)	(-)
Test duration [s]	> 600	> 600	> 600	> 600
Flame range [mm]	(-)	(-)	(-)	(-)
Heat for stable burning Qsb [MJ/m^2]	(-)			
Critical flow during CFE extinguishing (kW/m^2)	50	50	50	50

Observation during testing: (-)

Problems during testing: None

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Flame front motion test				
Distance from the hottest end of the sample	Verified heat flow value	Time to reach the distance by the flame front		
		Sample		
		1	2	3
[mm]	[kW/m²]	[s]		
50	50,3	(-)	(-)	(-)
100	(-)	(-)	(-)	(-)
150	47,1	(-)	(-)	(-)
200	(-)	(-)	(-)	(-)
250	38,9	(-)	(-)	(-)
300	(-)	(-)	(-)	(-)
350	24,0	(-)	(-)	(-)
450	13,1	(-)	(-)	(-)
550	6,3	(-)	(-)	(-)
650	3,3	(-)	(-)	(-)
750	1,4	(-)	(-)	(-)

7 CONCLUSION

Material requirements in accordance with ČSN EN 45545-2+A1							
Material group	Reference to test methodology	Parameter and unit	Maximum or minimum	HL1	HL2	HL3	Acquired results ± U
R1	T10.01 ČSN EN ISO 5659-2: 50 kW/m2	Ds(4)	maximum	600	300	150	**0,1 ± 0,0**
	T10.02 ČSN EN ISO 5659-2: 50 kW/m2	VOF(4)	maximum	1200	600	300	**0,1 ± 0,1**
	T02 ISO 5658-2	CFE kW/m2	minimum	20	20	20	**50 ± 0,0**
	T03.01 ISO 5660-1: 50 kW/m2	MARHE kW/m2	maximum	(-)	90	60	**1,3 ± 2,6**
	T11.01 ČSN EN ISO 5659-2: 50 kW/m2	CIT(G)	maximum	1,2	0,9	0,75	**0,37 ± 0,11**

U is expanded uncertainty (k=2) corresponding to a 95% confidence interval.

Material requirements in accordance with ČSN EN 45545-2+A1							
Material group	Reference to test methodology	Parameter and unit	Maximum or minimum	HL1	HL2	HL3	Acquired results ± U
R7	T10.04 ČSN EN ISO 5659-2: 50 kW/m2	Ds(max)	maximum	(-)	600	300	**1,3 ± 0,4**
	T02 ISO 5658-2	CFE kW/m2	minimum	20	20	20	**50 ± 0,0**
	T03.01 ISO 5660-1: 50 kW/m2	MARHE kW/m2	maximum	(-)	90	60	**1,3 ± 2,6**
	T11.01 EN ISO 5659-2: 50 kW/m2	CIT(G)	maximum	(-)	1,8	1,5	**0,37 ± 0,11**
R17	T10.04 ČSN EN ISO 5659-2: 50 kW/m2	Ds(max)	maximum	(-)	600	300	**1,3 ± 0,4**
	T02 ISO 5658-2	CFE kW/m2	minimum	13	13	13	**50 ± 0,0**
	T03.01 ISO 5660-1: 50 kW/m2	MARHE kW/m2	maximum	(-)	90	60	**1,3 ± 2,6**
	T11.01 EN ISO 5659-2: 50 kW/m2	CIT(G)	maximum	(-)	1,8	1,5	**0,37 ± 0,11**

U is expanded uncertainty (k=2) corresponding to a 95% confidence interval.

7.1 Statement of conformity

Al-Aralamino with self-adhesive layer manufactured by Izolex Bratislava, a.s. is consistent with requirements of the set of requirements relating to the R1 material group in all parameters in accordance with the Article 4.8 of the ČSN N 45545-2+A1 standard with classification into **HL1, HL2 and HL3.**

Al-Aralamino with self-adhesive layer manufactured by Izolex Bratislava, a.s. is consistent with requirements of the set of requirements relating to the R7 material group in all parameters in accordance with the Article 4.8 of the ČSN N 45545-2+A1 standard with classification into **HL1, HL2 and HL3.**

Al-Aralamino with self-adhesive layer manufactured by Izolex Bratislava, a.s. is consistent with requirements of the set of requirements relating to the R17 material group in all parameters in accordance with the Article 4.8 of the ČSN N 45545-2+A1 standard with classification into **HL1, HL2 and HL3.**

The decision rule for a statement of conformity is governed by ILAC-G8.

Any unforeseen events or deviations from the set procedure: None

The test was carried out in accordance with the current test methods and the Client's contractual requirements.

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

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8 APPENDIX (1 page)

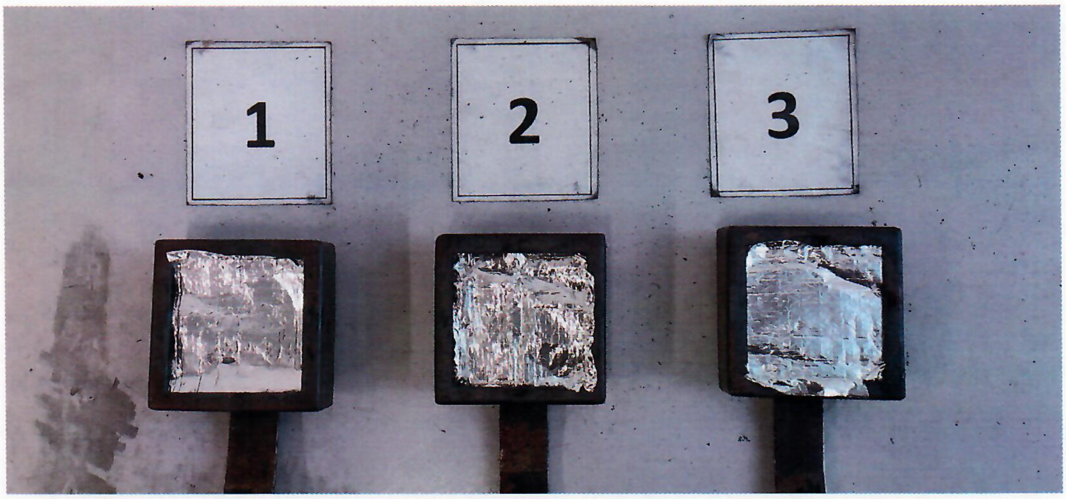

Figure 3 – Samples after test in accordance with ČSN EN ISO 5659-2: 50 kW/m2

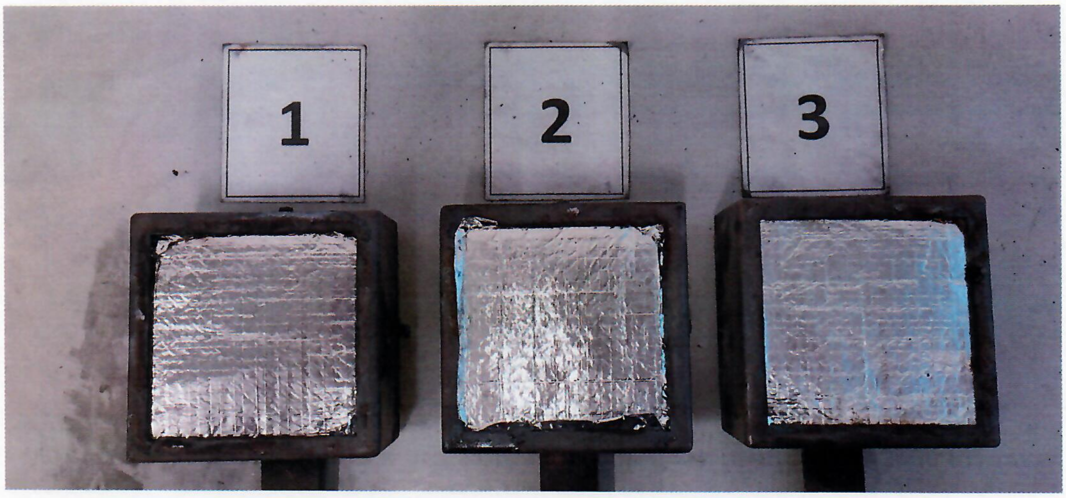

Figure 4 – Samples after test in accordance with ISO 5660-1: 25 kW/m2

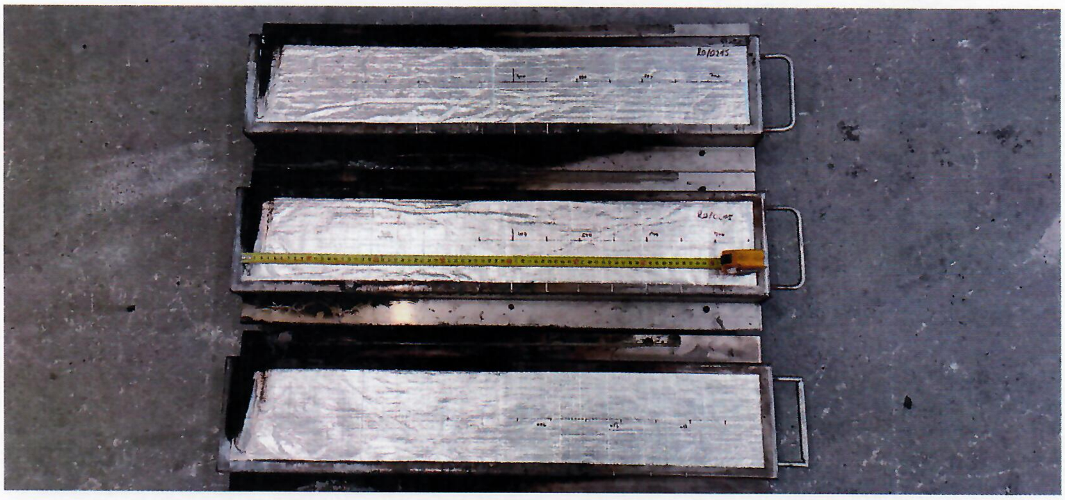

Figure 5 – Samples after test in accordance with ISO 5658-2