

LLC "BUILDING LABORATORY"
Testing laboratory for building materials, products and constructions
Accreditation certificate No. 2H366 issued by the National Accreditation Agency of Ukraine
dated September 03, 2018, according to DSTU/ISO/IEC 17025:2006

Approved
Director of testing laboratory
LLC "Building Laboratory"
Zanko V.
"04" __07__2019

PROTOCOL №407
of testing the elements of facade systems on a flexible basis
(determining vapor permeability)

TESTING REASON: Application by LLC "IN-DEMAND" №122/2 of 20.05.2019

SAMPLES CHARACTERISTICS: For testing purposes, the client has provided the production samples, that according to the accompanying documentation are identified as elements of facade systems on a flexible basis. Size of the element: (250x250)mm, width - (3.5±0.5)mm. Amount of samples - 3 items. Registration № of the samples - 20.05/06-01÷03.

TESTING PURPOSE: Determination of vapor permeability of the material of the elements of facade systems on a flexible basis according to the requirements of p.3.3.3 (table 2, row 4) TC U 23.9-418829990-001 :2018"

SAMPLES SELECTION: Samples selection has been done by Client.

EXECUTANT: "LLC "Building Laboratory", 54029, Mykolaiv, Robocha st, 2

CLIENT-PRODUCER: "LLC "IN-DEMAND", 37710, Ukraine, Poltava reg., Orzhitsky dist., Lazirky, Tsentralna st. 2B/2

Date of samples supplied to the laboratory: 20.05.2019
Date of performing the testing: 20.05-04.07.2019

1. Regulatory references

- DSTU B B.2.6-36:2008

Constructions of houses and buildings. Constructions of external walls with facade thermal insulation and plaster facing.
General technical conditions."

- DSTU B B.2.7-253:2011

Building materials and products. Method of determining the vapor permeability resistance.

- TC U 23.9-418829990-001:2018

Facade system on a flexible basis. Technical conditions.

2. Measurement technical instruments, testing equipment

Table 1 - List of measurement technical instruments and testing equipment

Name	Type, brand	Characteristics	Extended uncertainty/deviation (class)	Calibration date
1	2	3	4	5
Scales, electronic laboratory	WPS 4000/C/1	range (0,5÷4000)g scale value 0,01g accuracy class 3	500 g: U=11.6mg 1000g: U=11.7mg	08.04.2019
Scales, analytical laboratory	"ВЛА-200-М"	(0,2÷200)g 0,0001g	0,05g: U=0,004g 5g: U=0,021g 50g: U=0,032g 100g: U=0,053g 200g: U=0,106g	29.02.2016
Thermometer, glass laboratory	"ТЛ-5"	range (0÷105)°C scale value 0,5°C	20°C: U=0,175°C 70°C: U=0,593°C 90°C: U=0,593°C	15.03.2019
Caliper	"ШЦ1- III - 160-0,05"	range (0÷160)mm scale value 0,05mm	21,12mm: U=0,06mm 51,14mm: U=0,06mm 101,18mm: U=0,06mm	12.04.2018
Air conditions meter	Ea2	range T (0÷50)°C scale value 0,1°C range W (20÷99)% scale value 1% range P (637÷787)mmHg scale value 0,1mmHg	T=20°C: U=0,14°C W=50,0%: U=3,7% P=100gPa: U=0,81gPa	28.09.2018

3. Conditions for testing performance:

- temperature, °C: 21-22;
- atmospheric pressure, mmHg: 748-761
- humidity, %: 50-59

4. Testing results:

Testing method - DSTU B B.2.7-253:2011

Testing samples - cylindrical samples of (100±2)mm in diameter cut out of the middle of the facade systems elements. Amount of samples - 3 items.

Visual examination of the samples before testing - defects and mechanical damages are absent - the samples are valid for testing.

Testing results are presented in Table 2.

Table 2 - Results of determining the vapor permeability of the elements of facade systems on flexible basis

Registration № of the samples being tested	Characteristics of the testing samples			Density of the water vapor flow, q, mg/h*m ²			Vapor permeability resistance, R, m ² *h*Pa/mg		Vapor permeability of material, μ, mg*m*h*Pa
	average diameter of sample, mm	area of sample, m ²	average width of sample, mm	1 weighting	2 weighting	3 weighting	of separate sample (the lowest flow value)	average	
1	2	3	4	5	6	7	8	9	10
№20.05/06-01	98,5	0,007616	3,45	3751	3790	3814	0,32	0,34	0,01
№20.05/06-02	99,4	0,007756	3,54	3553	3553	3599	0,34		
№20.05/06-03	99,0	0,007694	3,48	3404	3420	3443	0,36		

NOTES:

1. Testing protocol refers only to those samples that have been tested.
2. Testing protocol can not be copied, unless completely, without permission of LLC "Building Laboratory".

Responsible executor and responsible for protocol conduction
Chief engineer

Heorhiev V.

