

No. Report: 3777

Date: 11.07.2023

Client: EXTRUPLAST S.R.L.

Product: PVC window EXTRUPLAST series ARKITEK 70






TEST AND CLASSIFICATION REPORT
Product: PVC window EXTRUPLAST series ARKITEK 70
No. Report 3777

This report refers to the performance of exterior windows and doors as described in the product standard EN 14351-1:2006+A2:2016 - Windows and doors Product standard, performance characteristics. Part I. Exterior windows and doors for pedestrians.

Client: EXTRUPLAST S.R.L.
Address: Str. Petre Dulfu nr.124, Tohat, Ulmeni, Maramures, Romania
Sample/system description: PVC window, white color, two door leaves, with tilt and turn mullion, EXTRUPLAST profile Arkitek 70 series
Hardware: ROTO
Sample code: AXA F046 23
Sample sizes: 1800 mm x 1480 mm
No. /date of entering the laboratory: 04.07.2023

CLASSIFICATION REPORT

<i>Wind loading</i>	<i>Water tightness</i>	<i>Air permeability</i>
		
C3	8A	4
EN 12210	EN 12208	EN 12207

Test date: 11.07.2023
Laboratory Head,
Eng. Andi PREDA




Technical Director,
Dragos GHEORGHE



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APPENDIX 1
DATA ABOUT THE TESTED SAMPLE

Component material name	Type	Code	Dimensions: mm (intXdepthXexterior)	Number	
Frame	EXTRUPLAST Arkitek 70mm	F10	70x64	1	
Sash	EXTRUPLAST Arkitek 70mm	F20	70x78	2	
Mullion	EXTRUPLAST Arkitek 70mm	F60	70x68	1	
Ramrod	EXTRUPLAST Arkitek 70mm	F41	25x28.7	8	
Gasket	Co-extruded	-	-	-	
Reinforcement	25x35x25x1.5 30x25x30x1.5	A1051 – TOC A6051 – Mullion	-	-	
Glazing	Double glazing 24 mm (4-16-4)	-	PLANICLEAR 4 mm - spacer AL 16 mm (Argon 90%) - PLANITHERM XN PLANICLEAR 4 mm	2	
Hardware	ROTO	-	-	Hinge	4
				Blocking points	16
Drainage holes	Pcs: 7	Interior 5x25mm	Pcs: 4	Exterior 5x25 mm	Pcs: 3

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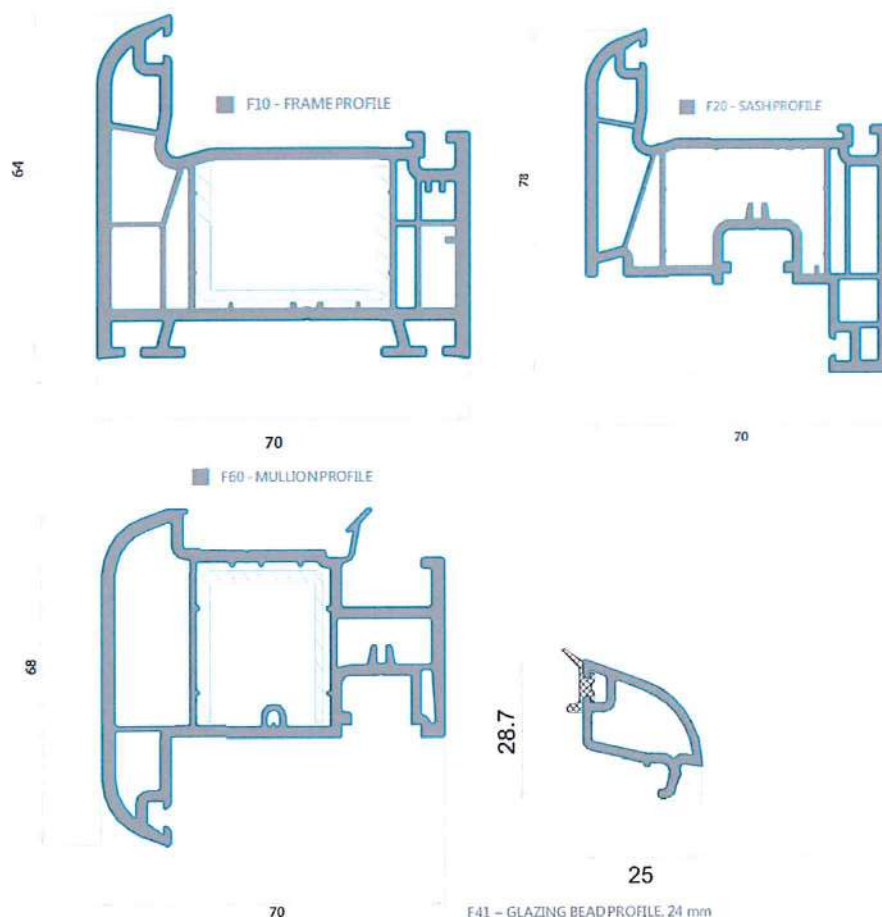
Client: **EXTRUPLAST S.R.L.**

Product: **PVC window EXTRUPLAST series ARKITEK 70**

Sample sizes:	Frame	Sash
Length / L	1800 mm	861 mm x 2pcs
Height / H	1480 mm	1410 mm
The length of the joints in the installation	7.67 ml	-
The surface of the test chamber	2.66 ml	-

The data was processed in accordance with the sample sheet attached to this test report.

This Appendix also includes the sketch with the description of the related profile and reinforcement system.



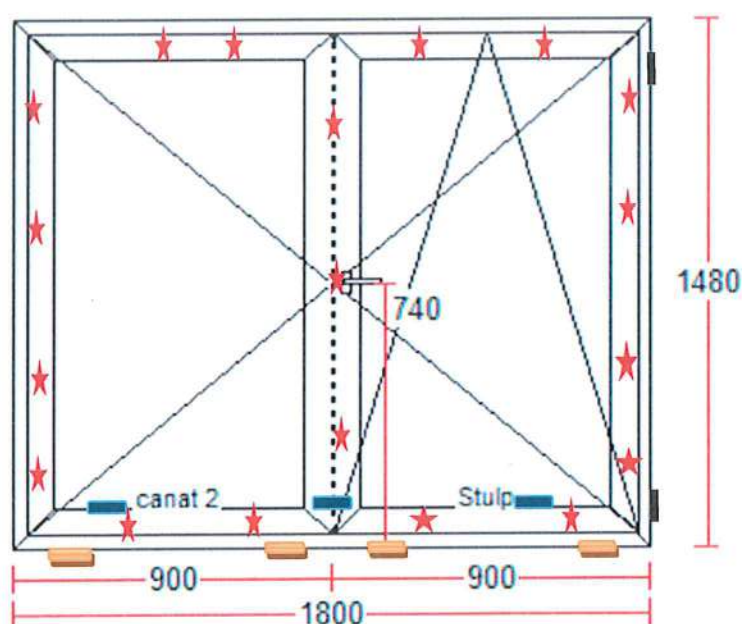
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Sample outline:



Legend:

-  -hinge
-  -blockers
-  - external exhaust holes
-  - external exhaust holes

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APPENDIX 2 - REPORT DESCRIPTION

1. TECHNICAL REQUIREMENTS ESTABLISHED ACCORDING TO PRODUCT STANDARDS

Test method/classification	Performance characteristics / units of measurement:	Requirements/ Classes
EN 1026 EN 12207	Air permeability (m^3/hm^2)	Npd/ Class 1-4
EN 1027 EN 12208	Water tightness (Pa)	Npd/ Class (0- E xxx)
EN12211 EN 12210	Resistance to wind load (Pa)	Npd/ Class(A-B-C 1-5- Exxx)
EN 14609 EN 13115	Resistance capacity of safety devices (N)	Npd/ Class (appropriate/ inappropriate)
EN 12046-1 EN 13115	Drive forces	Npd/ Class
EN 14608 EN 13115	Mechanical strength (N)	Npd/ Class
EN 10077-1 EN 10077-2	Thermal transmittance ($\text{W}/\text{m}^2\text{K}$) determination	Npd/ Declared performance:
EN ISO 10140-2 EN ISO 717-1	Sound performance (dB) determination	Npd/ Declared performance
regulation	Emission of harmful substances	Npd/ According to established norms

Npd – It cannot be determined according to **EN 14351-1:2006+A2:2016**

Warning! Some performance characteristics may have threshold values of the states where the product is placed on the market. The tests were carried out according to the provisions of the **EN 14351-1:2006+A2:2016** standard based on the test standards specific to the performance characteristics listed in point 1.

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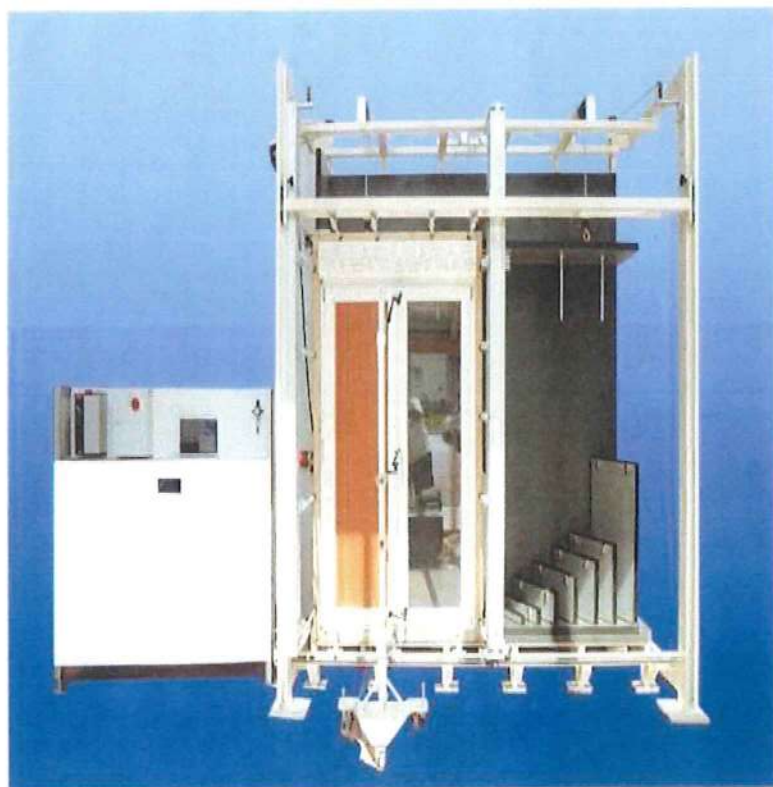
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2. DATA ABOUT THE TESTING FACILITY

The installation was produced by **HOLTEN Germany** in 2012 and was put into operation in October 2012, being calibrated by **METROMAT S.R.L** on **29.09.2020** according to calibration certificate no. **13194-09.20**



TECHNICAL DATA OF THE FACILITY

a° TEST STAND type MB 06-2008

- maximum dimensions of the test stand:
- length..... 3000 mm
- height..... 3000 mm

b° CONTROL UNIT: R 375-4000

- maximum pressure..... ± 4.000 Pa
- maximum air volume.....375 m³/h
- growth ratio.....0,5÷1,0 m³/h
- maximum amount of water.....50 l/min

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3 DESCRIPTION OF THE TESTS - RESULTS

3.1 PREPARATION OF THE TEST SAMPLE

The ambient temperature at which the tests are carried out is greater than 16 °C to 30 °C and a humidity between 25 % and 75 %.

Preparing the sample for testing: it settles into ambient laboratory temperature for at least 24 hours before testing. Fixing the sample in the test chamber is done so that it does not deform or twist, and the moving parts are functional.

3.2 AIR PERMEABILITY TEST

3.2.1 SAMPLE PREPARATION

The air permeability test is carried out according to EN 1026 "Windows and doors. Air permeability Testing method".

The test sample is cleaned and dried. The ventilation slots are closed. All the mobile parts of the test sample close and open at least once before immobilizing them in the closed position.

3.2.2 PERFORMING THE TEST

The test is carried out with the help of the installation software by applying three pulses of the test pressure 500 Pa for 3 s.

After that, positive and negative pressures are applied in steps of 50 Pa up to 300 Pa followed by steps of 150 Pa up to the maximum pressure of 600 Pa.

The values of the expressed flow Q (m³/h) that cross the sample to be tested are thus determined according to the pressure difference on the two sides.

By calculation, the values of the measured air flow are determined in relation to the perimeter of the joints (m³/hm) as well as the surface of the sample to be tested (m³/hm²).

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The software of the installation generates the characteristic curve of the lost air flow relative to the perimeter of the joints and the surface of the window, as well as the determined values of the air flow measured at the applied pressures.

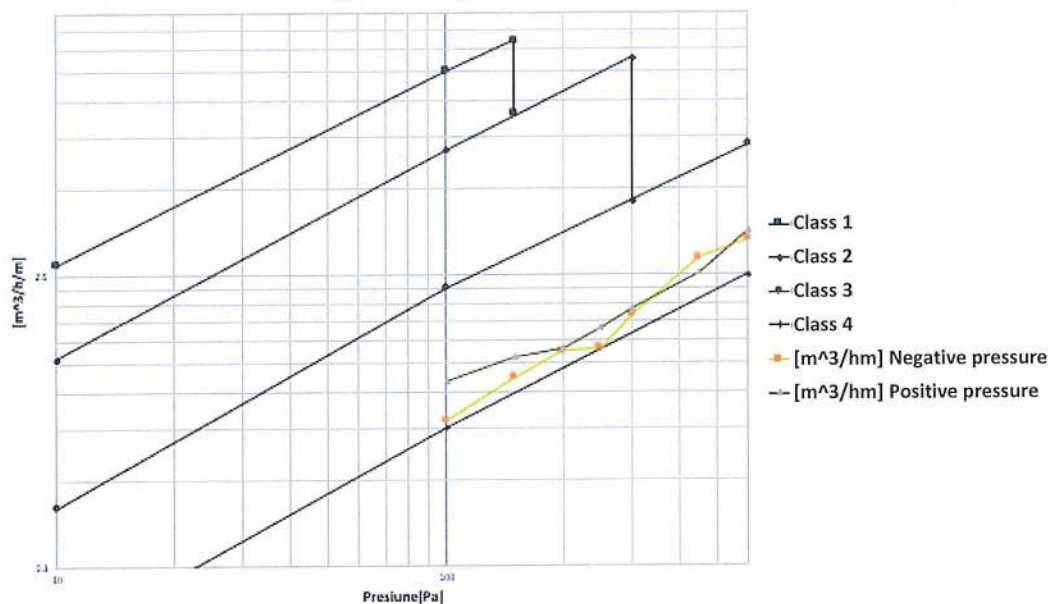
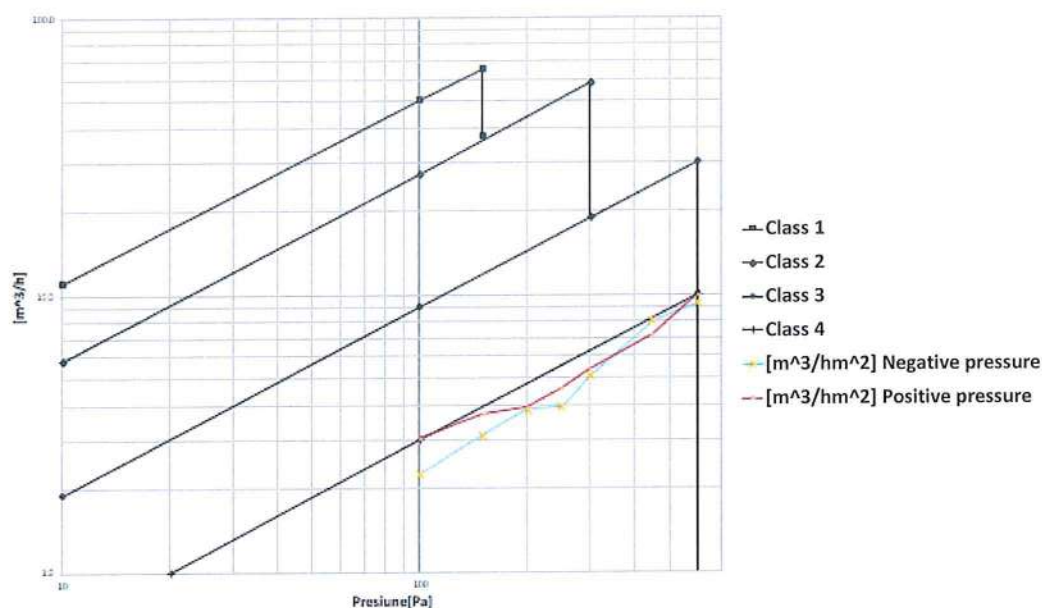
Air test				
Positive pressure				
Phase	Pressure	Debit		
[-]	[Pa]	[m³/h]	[m³/h/m²]	[m³/h/m]
1	100.000	6.390	3.043	1.083
2	150.000	7.767	3.698	1.316
3	200.000	8.247	3.927	1.398
4	250.000	9.689	4.614	1.642
5	300.000	11.274	5.369	1.911
6	450.000	15.005	7.145	2.543
7	600.000	20.979	9.990	3.556
8	0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000
11	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000
17	0.000	0.000	0.000	0.000
18	0.000	0.000	0.000	0.000
19	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000
Negative pressure				
Phase	Pressure	Debit		
[-]	[Pa]	[m³/h]	[m³/h/m²]	[m³/h/m]
1	-100.000	4.692	2.234	0.795
2	-150.000	6.550	3.119	1.110
3	-200.000	8.103	3.859	1.373
4	-250.000	8.263	3.935	1.401
5	-300.000	10.649	5.071	1.805
6	-450.000	16.911	8.053	2.866
7	-600.000	19.601	9.334	3.322
8	0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000
11	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000
17	0.000	0.000	0.000	0.000
18	0.000	0.000	0.000	0.000
19	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000

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3.2.3 CLASSIFICATION

The classification is made according to **EN 12207**, taking into account the air flow lost at the positive or negative pressure of 100 Pa related to the total surface of the test element and/or the perimeter of the joints of the movable part.

According to **4.7 of EN 12207**, if a test element is classified according to the two methods mentioned above, resulting

- same class. The tested element must be classified in one and the same class;
- two adjacent classes. The tested element must be classified in the most favorable class;
- a difference of two classes. The tested element must be classified in the medium class;
- a difference of more than two classes. The tested element should not be classified;

Technic al class	Pressure Maximum test -Pa-	Classification related to:	
		The total surface of the testing element -m ³ /hm ² -	Perimeter joints moving part/parts -m ³ /hm ² -
1	150	<50	<12.50
2	300	<27	<6.75
3	600	<9	<2.75
4	600	<3	<0.75

CLASSIFICATION: The air permeability class of the sample

Class 4

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3.3 WATERTIGHT TEST

3.3.1 SAMPLE PREPARATION

The sample for the test is checked for the functionality of the moving parts and the blockage of the ventilation systems is checked.

3.3.2 PERFORMING THE TEST

The test is carried out according to EN 1027 and initially consists in spraying the test sample with water, on the outer face, at a flow rate of 2l/min/m² for 15 min at a pressure of 0 Pa.

The test is carried out for protected type B windows with a spray flow rate of 1l/min/m², unprotected type A windows with a spray flow rate of 2l/min/m².

The next stage consists in maintaining the water sprinkling and applying positive test pressures for 5 min in steps of 50 Pa up to 300 Pa and 150 Pa, until the appearance of water infiltrations through the test sample. The classification in the technical classes is done with a step lower than the one at which the water infiltration occurs.

3.3.3 CLASSIFICATION

The classification is made according to EN 12208 and consists in the classification into technical classes depending on the test pressure and the penetration of water infiltrations through the sample.

Test pressure	Specifications	Test method A	Test method B	Classification	
				A	B
0	15 min	1 A	1 B	-	-
50	Idem 1 + 5 min	2 A	2 B	-	-
100	Idem 2 + 5 min	3 A	3 B	-	-
150	Idem 3 + 5 min	4 A	4 B	-	-
200	Idem 4 + 5 min	5 A	5 B	-	-
250	Idem 5 + 5 min	6 A	6 B	-	-
300	Idem 6 + 5 min	7 A	7 B	-	-
450	Idem 7 + 5 min	8 A	-	C	-
600	Idem 8 + 5 min	9A	-	X	-
750	Idem 9 + 5 min	E750	-	-	-
900	Idem 10 + 5 min	E900	-	-	-
1050	Idem 11 + 5 min	E1050	-	-	-
1200	Idem 12 + 5 min	E1200	-	-	-
X - water infiltrations appear		C - class employment			

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3.4 RESISTANCE TO WIND LOAD

3.4.1. SAMPLE PREPARATION

The sample for the test is checked for the functionality of the moving parts and the blocking of the ventilation systems, the fixing of the microcomparators in contact with the door leaf of the sample and bringing them to the 0 value are checked.

3.4.2 PERFORMING THE TEST

The test is done according to **EN 12211**, the test sample is subjected to three distinct stages of pressure as follows:

1. DETERMINATION STAGE OF THE DOOR LEAF DEFORMATION under the action of pressure **P1**;

2. STAGE FOR DETERMINING THE REPEATABILITY OF THE PERFORMANCE OF THE SAMPLE after subjecting the sample to 50 cycles of positive and negative pressure **P2 = 0.5 P1**;

3. STAGE FOR DETERMINING THE RESISTANCE (FUNCTION SECURITY) of the sample after subjecting it to negative and then positive pressure impulses with pressure **P3 = 1.5 P**

DESCRIPTION OF THE STAGES

STAGE 1 - DETERMINATION OF THE DOOR LEAF DEFORMATION

The sample is subjected to a sequence of three impulses **10%** higher than **P1**, i.e. **1320 Pa** and is maintained for 3 s, then the sashes are opened and closed 5 times to check functionality.

The positive pressure **P1 = 1200 Pa** is applied in increments of 100 Pa/s with the maintenance of 30 s, the deformation at the pressure peak at points A, B, C and then the residual deformation after 60 s are recorded. The sample being verified from the point of view of functionality by successively opening and closing the mobile elements.

The negative pressure **P1 = - 1200 Pa** is applied in decreasing steps of 100 Pa/s with the maintenance of 30 s, the deformation is recorded at points A, B, C and then the residual deformation after 60 s.

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Wind load resistance test:

Wind test				
Pressure phase	Positive pressure [Pa]	1200	Return time [s]	60
	Pressure	A1	A2	A3
[-]	[Pa]	[mm]	[mm]	[mm]
1	100.000	0.000	0.090	0.000
2	200.000	0.040	0.210	0.000
3	300.000	0.090	0.340	0.040
4	400.000	0.130	0.470	0.070
5	500.000	0.200	0.670	0.140
6	600.000	0.260	0.830	0.200
7	700.000	0.360	1.040	0.310
8	800.000	0.440	1.230	0.400
9	900.000	0.560	1.530	0.570
10	1000.000	0.600	1.640	0.650
11	1100.000	0.720	1.880	0.780
12	1200.000	0.790	2.020	0.880
13	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000
17	0.000	0.000	0.000	0.000
18	0.000	0.000	0.000	0.000
19	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000
Return		0.049999997	0.020000011	0.030000005
A2-[(A1+A3)] Max	1.184999943	A2-[(A1+A3)] Return	-0.019999988	
Depression phase	Negative pressure [Pa]	0	Return time [s]	60
[-]	Pressure [Pa]	A1 [mm]	A2 [mm]	A3 [mm]
1	-100.000	-0.030	-0.100	-0.040
2	-200.000	-0.070	-0.230	-0.080
3	-300.000	-0.100	-0.310	-0.120
4	-400.000	-0.180	-0.470	-0.210
5	-500.000	-0.190	-0.500	-0.210
6	-600.000	-0.280	-0.680	-0.320
7	-700.000	-0.360	-0.820	-0.400
8	-800.000	-0.380	-0.870	-0.410
9	-900.000	-0.450	-0.990	-0.500
10	-1000.000	-0.550	-1.160	-0.620
11	-1100.000	-0.590	-1.280	-0.690
12	-1200.000	-0.670	-1.360	-0.750
13	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000
17	0.000	0.000	0.000	0.000
18	0.000	0.000	0.000	0.000
19	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000
Return		-0.210000008	-0.239999998	-0.359999985
A2-[(A1+A3)] Max	-0.650000036	A2-[(A1+A3)] Return	0.045000017	

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CLASSIFICATION: Based on the recorded values of the deformations, the arrow (frontal deformation) is calculated

It is marked with **X** class achieved!

It is marked with X class achieved.											
Pressure impulse P1 positive / negative	Deformation of the vertical upright in test points A, B, C (mm)								Arrow class		
	Superior A		Median B		Lower C		Frontal deformation				
	P+	P-	P+	P-	P+	P-	P+	P-			
1200	0.7	0.6	2.0	1.3	0.8	0.7	1.1	0.6	A <1/1 50	B <1/200	C <1/300
0	Remaining deformation after 60 s										
	0.0	0.2	0.0	0.2	0.0	0.3	0.0	0.0			

L = The maximum length between measuring points A-C is **L=1410 mm**.

The maximum frontal deformation of the upright at overpressure is **1.1 mm** and at depression **0.6 mm**.

Classification of the relatively normal arrow according to the maximum relative frontal deformation.

Maximum rate of deformation:

- at positive pressure: $1.1/1410 = 0.0007 < 1/300 = 0.003$

- at negative pressure: $0.6/1410 = 0.0004 < 1/300 = 0.003$

STAGE 2 - DETERMINATION OF THE REPEATABILITY OF THE PERFORMANCE

The sample is subjected to 50 cycles with pressure (negative, positive) **P2 of 600 Pa**, then the determination of air permeability is repeated, the maximum allowed difference being **20%**. In the affirmative case, proceed to the determination of operational safety.

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CLASSIFICATION

After performing the test, the test sample **shows no malfunctions** in the handling capacity of the mobile elements or of the fixed joints during five opening-closing cycles.

Regarding the air permeability test, the sample remained in the same air permeability class.

STAGE 3 - DETERMINATION OF THE RESISTANCE (FUNCTION SECURITY)

The sample is subjected to a negative pressure impulse **P3 = -1800 Pa** and then to a positive pressure impulse **P3 = 1800 Pa**, after which the functionality of the sample is checked by opening/closing the door leaves. The impulses are applied in steps **from 0 Pa to ± 12800 Pa, maintained at ± 1800 Pa for 10s, return to 0 Pa in max. 10s**. *The tested sample shows no changes in handling capacity.*

CLASSIFICATION

The sample falls into one of the following five classes, if it maintains its functionality after applying pressure:

- P3 = 600 Pa for class 1
- P3 = 1200 Pa for class 2
- **P3 = 1800 Pa for class 3**
- P3 = 2400 Pa for class 4
- P3 = 3000 Pa for class 5

Classification in technical classes of operational safety
CLASS 3

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GENERAL PICTURE OF THE SAMPLE



FINAL NOTE:

The results of the evaluations refer strictly to the sample tested. The test procedures are developed in accordance with the requirements of **EN ISO/CEI 17025:2018**. Final results are not valid without Appendix 1 Sample Sheet. The validity of this report is maintained as long as the rules remain in force and the product does not undergo changes.

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GENERAL PICTURE OF THE SAMPLE



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