Requirements for windows and exterior doors according to DIN EN 14351-1

Weiss Certificates:
ift-Nachweis No. 16-004244-PR01 (NW-A01-02-de-02) on July 10, 2017
ift-Nachweis No. 16-004244-PR02 (NW-A01-03-de-01) on August 09, 2017
ift-Nachweis No. 16-004244-PR03 (NW-A01-03-de-01) on August 10, 2017
ift-Nachweis No. 16-004244-PR07 (NW-A01-03-de-02) on July 10, 2017

Tested was:
Material: aluminium-plastic composite profile
External dimension (WxH): 1400mm x 2300mm

Used were:
COSMO PU-200.280
COSMO HD-200.101
COSMO HD-100.411
COSMO CA-500.110
COSMO HD-100.510

The fields marked in green correspond to the classes reached by Weiss in the tests.

Air permeability according to DIN EN 12207

The air permeability describes the air exchange that may occur through the joints between the frame and the window casement. The air exchange happens by an air pressure difference at the window. The air permeability of windows and doors is being classified according to DIN EN 12207 and is being tested according to DIN EN 1026. The classification is due to a comparison of the air permeability of the test specimen, referred to the total area and the air permeability, referred to the joint length.

Classification of the air permeability

Minimum test pressure Pa	Reference permeability at 100 Pa $m^3/(h * m^2)$ total area	Reference permeability at 100 Pa $m^3/(h * m)$ joint length	Classification acc. to DIN EN 12207
150	50	12.50	1
300	27	6.75	2
600	9	2.25	3
600	3	0.75	4

Resistance to wind load according to DIN EN 12210

The resistance of windows and doors to wind load is being classified according to DIN EN 12210 and is being tested according to DIN EN 12211.

Classification of wind load

Class	P1 [Pa]	P2 [Pa]	P3 [Pa]
1	400	200	600
2	800	400	1200
B3 / C3	1200	600	1800
4	1600	800	2400
5	2000	1000	3000

P1, P2 and P3 are the load limits of the test specimen.

At P1, pressure is applied to measure the deflection.

The pressure at P2 is being repeated intermittently for 50 times, thereby testing the performance of the test specimen at repeated wind loads.

At wind pressure P1 and P2, the test specimen must remain functional.

The test specimen must remain closed after the safety test with wind pressure P3 and no part of the specimen may break.

The relative frontal deflection of the most deformed frame part is being classified according to DIN EN 12210.

Water tightness according to DIN EN 12208

The watertightness characterizes the tightness of a window against water ingress from the outside at different wind pressures.

The watertightness of windows and doors is being classified according to DIN EN 12208 and is being tested according to DIN EN 1027.

Classification of water tightness

Test pressure P_{max} in Pa*	Classification according to DIN EN 12208		Requirements according to DIN EN 1027
	Method A	Method B	
0	1A	1B	15 min spraying
50	2A	2B	As class 1 + 5 min
100	3A	3B	As Class 2 + 5 min
150	4A	4B	As Class 3 + 5 min
200	5A	5B	As Class 4 + 5 min
250	6A	6B	As Class 5 + 5 min
300	7A	7B	As Class 6 + 5 min
450	8A		As Class 7 + 5 min
600	9A		As Class 8 + 5 min
> 600	Exxxx		Above 600 Pa in stages of 150 Pa, the duration of each stage must be 5 min

Method A, unlike Method B, is suitable for products that are in an unprotected position in the building. Method B is suitable for products that are partially protected.

* After 15 min without pressure load and 5 minutes at the subsequent stages.

Operating forces according to DIN EN 13115

On the one hand, the term operating force is considered to be the forces and torques for opening and closing windows and doors. On the other hand, the torque that is required for locking and closing the elements by using the closure device.

Classification of operating forces for windows

Resistance against operating forces	Class 0	Class 1	Class 2
Window	—	100 N	30 N

Mechanical strength according to DIN EN 13115

Mechanical loads are wind effects and the common use of windows by opening and closing.
The requirements and classification of mechanical stress are being defined in accordance with DIN EN 12400. The mechanical stress is being tested according to DIN EN 1191.

Window classes according to DIN EN 12400

Class	Group
1	Occasional
2	Easy
3	Medium
4	Strong

Opening and closing shall not cause damage to windows or french doors nor limit their performance with average service life and appropriate maintenance. By the division into groups, a statement about the use of the window is being made.

Long-term durability test according to DIN EN 12400

The long-term durability test is an important proof of the quality and durability of windows and exterior doors, which is not prescribed by law. The test is carried out by a machine turning, tilting, opening and closing of the complete window with all its assemblies such as frames, wings, infills, seals, fittings, etc.

Usually, the tests are carried out on test specimens with maximum dimensions and maximum weights. This process is being repeated according to the given number of cycles or until failure.

Class	Load
1	Easy
2	Medium
3	Strong

Class	Number of cycles	
0	—	Windows and doors
1	5 000	
2	10 000	
3	20 000	

Shock resistance according to DIN EN 13049

The impact resistance is a feature for the usability of glazed exterior doors with risk of injury. The planner should therefore specify the requirements, indicating the classes according to table 11.

According to the product standard, this proof is only necessary for glass doors with risk of injury.

For glazed doors that are used for the passage of persons, at least Class 1 according to DIN EN 13049:2003-08 should be complied with in accordance with table 11 below.

In the public sector, the application of class 2 according to DIN EN 13049 is being recommended.

Classification DIN EN 13049	1	2	3	4	5
Drop height [mm]	200	300	450	700	950
Classification DIN EN 12600	[3]	2		1	
Drop height [mm]	[190]	450		1200	

Table 11: Classifications and drop heights

The method for the impact testing and classification of flat glass is being regulated in DIN EN 12600.

Haiger, May 24, 2018

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Primary Sources

RAICO, FRAME+, Test standards for windows, test standards and classifications, 11.2008

PfB Prüfzentrum für Bauelemente (test centre for assembly parts), PfB guideline, version 11/2016

ift Rosenheim, Builders guide, Requirements of the product standard windows and exterior doors, DIN EN 14351-1, Dipl.-Ing. (FH) Jürgen, Bentitz-Wildenburg, 01/2013