BS EN 16580:2015

BSI Standards Publication

Windows and doors — Wetness and splash water proof door leaves — Test and classification

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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Portes et fenêtres - Vantaux de portes résistants à l'humidité et aux projections d'eau - Essai et classification

Fenster und Türen - Feuchte- und spritzwasserbeständige Türblätter - Prüfungen und Klassifizierung

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European foreword

This document (EN 16580:2015) has been prepared by Technical Committee CEN/TC 33 “Doors, windows, shutters, building hardware and curtain walling”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2016 and conflicting national standards shall be withdrawn at the latest by February 2016.

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Introduction

Increased requirements for hygiene lead to more intensive cleaning; at the same time, the working time spent on cleaning will be shortened and this requires cleaning processes which are efficient and automatically more stressing for the door leaves.

1 Scope

This European Standard identifies the performance characteristic that is applicable to door leaves for pedestrian doors, independent of the material, that are exposed to extended periods of wetness and/or frequent splash water.

NOTE Rain is not considered as “frequent splash water” condition.

This European Standard does not apply to:

— door leaves exposed to liquid having a pH-value lower than 5.5 or higher than 8.5;

— door frames, complete door assemblies or doorsets.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 951, *Door leaves - Method for measurement of height, width, thickness and squareness*

EN 952:1999, *Door leaves - General and local flatness - Measurement method*

EN 1027, *Windows and doors - Watertightness - Test method*

EN 1294, *Door leaves - Determination of the behaviour under humidity variations in successive uniform climates*

EN 1670, *Building hardware - Corrosion resistance - Requirements and test methods*

EN 12219:1999, *Doors - Climatic influences - Requirements and classification*

EN 12519:2004, *Windows and pedestrian doors - Terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12519:2004 and the following apply.

3.1
wetness door leaves
door leaves exposed to extended periods of wetness

3.2
splash water proof door leaves
door leaves used in areas where cleaning and/or splashing with water frequently takes place

4 Test specimen

The test shall be carried out on at least 3 test specimens of the same construction. Essential performance relevant design features of the constructive moisture protection shall be identical in all 3 specimens.

The width of the test specimen shall be between 800 mm to 1 000 mm and the height shall be between 1 900 mm to 2 250 mm. For specific projects or due to design and/or production constraints, other sizes can be used if clearly mentioned in the test report.

The test specimen shall be mounted with all building hardware, including the handle. The mounting of the building hardware shall be done by the client or following the manufacturer's manual. Necessary drillings for the building hardware shall be done by the client or the manufacturer. The door leaf can either be mounted in a test frame with hinges or fixed in front of a frame by a tensioning belt. The lower edge of the door leaf shall have min. 10 mm free space to get a circulation of the spraying liquid.

The client shall define from which side the spraying load has to be applied.

5 Test description

5.1 General

The test is carried out by bringing the door leaf in direct contact with water in specified intervals and afterwards identifies possible changes and/or cases of damage which adversely affect the usability and/or appearance of the door leaf.

5.2 Scope of testing

The test of wetness and splash water proof door leaves includes the following individual test sequences, each carried out before starting the test, after or during the test, and 24 h after the test sequence:

— measuring the thickness following the principles of EN 951;

— examination of errors in the general flatness according to EN 952;

— visual assessment of the specimen, especially the lower and lateral edges and the hinge and lock box area to identify possible changes in the local flatness.

Table 1 — Assessment criteria for testing of wetness and splash water capability

Criteria	Load Class	
	W (Wetness door leaf)	S (Splash water proof door leaf)
Thickness swell at the measuring points	max. 0,5 mm	max. 0,5 mm
Surface/surface layer	no apparent damage [a]	no apparent damage [a]
Door skin	no apparent damage [a]	no apparent damage [a]
Stiles and rails/concealed edge	no apparent damage [a]	no apparent damage [a]
Building hardware	no corrosion visible [b]	no corrosion visible [b]
Deformations	declaration following EN 12219:1999, Table 1 (at least Class 2)	declaration following EN 12219:1999, Table 1 (at least Class 2)

[a] The assessment is made visually obvious damage, without tools.

[b] The evaluation of "no visible corrosion of parts" does not make any statement concerning the corrosion behaviour according to EN 1670.

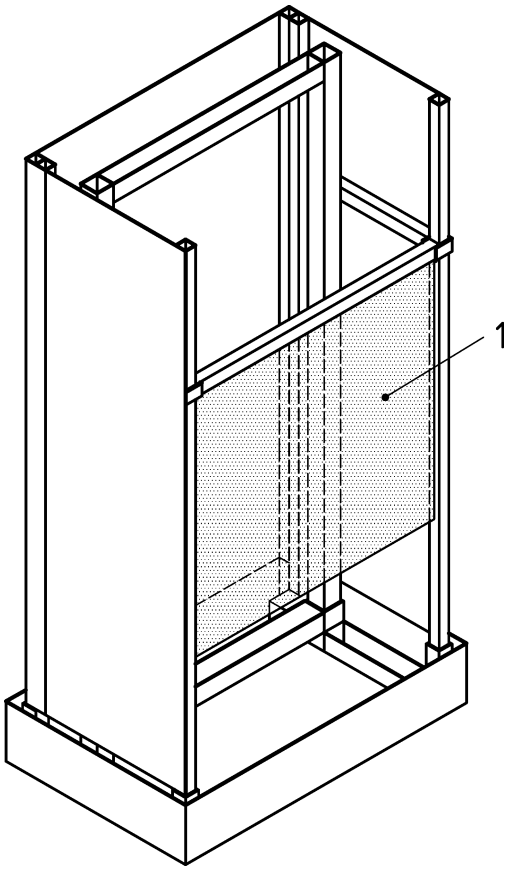
5.3 Spraying

The test of wetness door leaves consists of 48 cycles in total. Each cycle consists of 0,5 min of spraying and 29,5 min non-spraying time with (20 ± 2) °C water temperature.

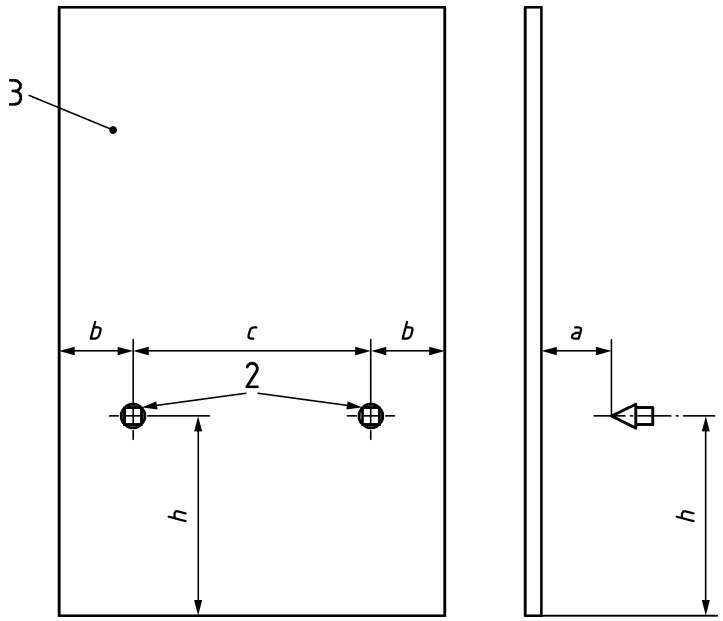
The test of splash water proof door leaves consists of 96 cycles in total. Each cycle consists of 4 min of spraying and 26 min non-spraying time. Just after finalizing the 96 cycles the lowest 10 mm of the door leaf shall stay dipped down in the water for 1 h. All with (30 ± 2) °C water temperature.

5.4 Description of the test rig

The testing consists of a cyclic showering with water. The specimen is vertical installed in a special test rig constructed as a showering wall (see Figure 1). The door leaf will be sprayed by two head to the door acting nozzle in accordance with the requirements of water load. In case the width is more than 1 160 mm at least one extra nozzle is added.



a)



b)

Key

1 splash guard
2 nozzles
3 door leaf

Figure 1 — Test rig with an open top tank and cross bar nozzle holder

Configuration of the nozzles:

—	amount:	at least 2;
—	distance to the specimen, a:	(200 ± 20) mm;
—	distance to lower edge specimen, h:	(500 ± 10) mm for load class W, (1 500 ± 10) mm for load class S;
—	distance to side edge specimen, b:	(200 ± 20) mm;
—	distance between the nozzles, c:	between 400 mm and 750 mm;
—	Spraying performance per nozzle:	1 l/min;
—	type of nozzles:	full cone nozzles according to EN 1027, each with a pump performance of min 1 l/min at 29 psi (2 bar) and a spray angle of 120°.

The water will be pumped through the nozzles direct on to the surface of the door leaf. To avoid blockages it is recommended to use a filter.

5.5 Spraying liquid

The spraying liquid is normal water from the tap with mild detergent. The pH-value of the spraying liquid shall be between 5.5 and 8.5.

6 Test procedure

6.1 Examination of the test specimen after delivery

After delivering the test specimens have to be checked visually regarding any damages, e.g. caused by transportation.

6.2 Conditioning

Before starting the test, the door leaf shall be stored for a minimum of 7 d in a non-destructive environment at (23 ± 2) °C with a relative humidity of (50 ± 5) % or at (20 ± 2) °C with a relative humidity of (65 ± 5) % according to EN 1294.

The surrounding test conditions of the laboratory shall be within the ranges of 15 °C to 30 °C and 25 % to 75 % relative humidity.

6.3 Test

After conditioning, the general flatness according to EN 952 shall be determined as well as any negative effects that might have appeared during conditioning. For measuring the thickness, the following points shall be defined (see also Figure 2). The thickness of the door leaf shall be determined to the nearest 1/10 mm.

Defined points of measurement:

— amount of measurement points: 7 (critical points);

— point 1 and 7 at the level of the lock;

— point 2 and 6 at the fixing height of the lower hinge;

— point 3 and 5 at the lower edge of the door leaf;

— point 4 in the middle of the lower edge of the door leaf.

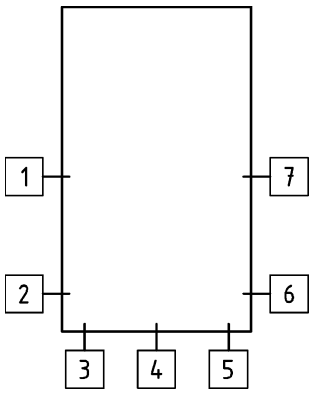


Figure 2 — Measurement points

6.4 Measurement and visually assessment after ending the test

After ending the test cycles the test specimen has to be taken out of the test rig immediately. This is followed by a determination of the general flatness according to EN 952:1999, 4.1 and 4.2 as well as measurements following the principles of EN 951 and the visual assessment. For visual assessment following criteria's have to be included:

— damages on the surface such as discoloration, cracks, expansion joints in face layers;

— defective bonding of surface sheets or cracks, respectively impaired joints;

— swelling and detachment, particularly at the potential water entry points in the hinge and lock area and at the lower edge of the door leaf;

— sign off in the skin.

Restore the test specimen in the same climate conditions as specified in 6.2 for 24 h. After 24 h the assessment has to be repeated.

The difference between the deformation values of the general flatness after 24 h after a test run is an assessment criterion. It has to be determined to the nearest 1/10 mm. The thickness swelling has to be determined to the nearest 1/10 mm. The results of the visual assessment particular damages have to be documented by pictures.

7 Classification

To get final classification all three test specimens shall fulfil the criteria according to 5.2, Table 1, before starting the test, after or during the test and 24 h after the test sequence.

The classification is given as P(W) for a wetness load proof door leaf and P(S) for a splash water load proof door leaf.

8 Test report

The test report shall contain the following information:

— reference to this European Standard;

— all necessary details to identify the door leaf and the loaded side of the leaf;

— all relevant details concerning the type, specified dimensions, materials, form and construction of the door leaf, including the position of the building hardware;

— overall door leaf dimension;

— laboratory storage and testing conditions;

— specification of the liquid used during the test including measured pH-value;

— information about load class;

— description of any failures in the surface;

— the obtained classification or an information if no classification can be obtained;

— if the test is stopped during the test it must be explained;

— name of testing laboratory;

— dates of test start and finalization;

— if necessary, pictures of visual damages have to be taken into the test report.

Bibliography

[1] EN 1121, *Doors - Behaviour between two different climates - Test method*

[2] EN 1191, *Windows and doors - Resistance to repeated opening and closing - Test method*

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