SLOVENSKI STANDARD
SIST EN 1027:2016

01-maj-2016

Nadomešča:
SIST EN 1027:2001

Okna in vrata - Neprepustnost za vodo - Preskusna metoda

Windows and doors - Water tightness - Test method

Fenster und Türen - Schlagregendichtheit - Prüfverfahren

Fenêtres et portes - Etanchéité à l'eau - Méthode d'essai

Ta slovenski standard je istoveten z: EN 1027:2016

ICS:

91.060.50	Vrata in okna	Doors and windows

SIST EN 1027:2016 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1027

March 2016

ICS 91.060.50

Supersedes EN 1027:2000

English Version

Windows and doors - Water tightness - Test method

Fenêtres et portes - Etanchéité à l'eau - Méthode d'essai

Fenster und Türen - Schlagregendichtheit - Prüfverfahren

This European Standard was approved by CEN on 9 January 2016.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword

This document (EN 1027:2016) 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of an identical text or by endorsement, at the latest by September 2016, and conflicting national standards shall be withdrawn at the latest by September 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1027:2000.

The revision of this European Standard clarifies only the test method and does not affect existing test evidence of EN 1027:2000.

This European Standard is one of a series of standards for windows and doorsets.

In comparison with EN 1027:2000, the following significant changes were made:

a) Clause 2: Deletion of "Normative references“;

b) Clause 3: Supplement of definition “closing condition”;

c) Sub-clause 3.2: Simplification of definition “test pressure”;

d) Sub-clause 3.3: Revision of definition “watertightness“;

e) Sub-clause 3.4: Revision of definition “water penetration”;

f) Sub-clause 5.4: Revision of definition "accuracy“;

g) Sub-clause 6.2: Editorial changes;

h) Sub-clause 6.2.4.1 and 6.2.4.2: More precise description;

i) Sub-clause 7.1: Addition of "closing condition“;

j) Clause 8: Supplement of necessary description of test specimen;

k) New Annex A: Revision of former Figures 1 and 2, separation of Figures into Figure A.1 up to Figure A.4;

l) New Annex A: Supplement of Figure A.5.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard defines the test method to be used to determine the watertightness of completely assembled windows and doorsets of any materials. This test method is designed to take account of conditions in use, when the window or doorset is installed in accordance with the manufacturer's specification and the requirements of relevant European Standards and codes of practice.

This European Standard does not apply to the joints between the window or door frame and the building construction.

2 Normative references

Not applicable.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
closing condition
3.1.1
closed
movable parts rest in or at the fixed parts in a way in which they may be fastened (latched and/or locked)

3.1.2
fastened
where the movable part is restrained at one or more points and shall be described by at least one of the two as listed below

3.1.2.1
latched
movable part is returned to its closed position and restrained by either

a) a self - engaging fastener or

b) a roller catch or

c) a latch

3.1.2.2
locked
movable part is further restrained in the closed position by additional operations (of e.g. handle, key, automatic devices or electronic devices) to engage integrated locking devices (e.g. nutbolts or deadbolts) which will affect the product's characteristics

3.1.3
secured
any action(s) which prevent unauthorised release of the fastening device(s) to allow exit or entry (e.g. child safety, burglary)

3.2
test pressure
difference between the static air pressures inside and outside of the test chamber

Note 1 to entry: The test pressure is positive if the static air pressure inside the chamber of the test apparatus is higher than that outside the test chamber.

Note 2 to entry: The test pressure is negative if the static air pressure inside the chamber of the test apparatus is lower than that outside the test chamber.

3.3
watertightness
ability of the test specimen to resist water penetration under the test conditions up to a pressure (P_{max} = limit of the watertightness)

3.4
water penetration
continuous or repeated wetting of

1) parts of the inside face of the test specimen or

2) any parts of the test specimen intended to remain dry, not being part of the water drainage system to the outside, or

3) any parts of the test specimen where water does not drain to the outside in a controlled way

Note 1 to entry: Continuous wetting could be described as an uninterrupted sequence of water, e.g. thin line of water, repeated wetting could be described as frequent intervals of water, e.g. more than one drop of water.

3.5
limit of watertightness
maximum test pressure P_{max} up to which the test specimen remains watertight under the test conditions for the specified time

4 Principle of test

Constant spraying of a specified quantity of water onto the external surface of the test specimen while increments of positive test pressure are applied at regular intervals during which details are recorded of test pressure and location of water penetration.

5 Test apparatus

5.1 A chamber with an open side to which the test specimen can be fitted. It shall be constructed so as to be able to withstand the test pressures without deflecting to an extent likely to influence the test results.

5.2 Means for applying controlled test pressure to the test specimen.

5.3 Means of producing rapid changes in test pressure, controlled within defined limits.

5.4 Instrument suitable for measuring the quantity of water supplied within an accuracy of ± 10 % of the measured value.

If several rows of nozzles with different flows are included, the total flow of water has to be checked. It shall be in accordance with 5.6 c). Furthermore the spraying pattern of the lower row of nozzles has to be checked additionally.

It is recommended to use at least two such instruments.

NOTE 1 Accuracy = ± (the sum of the amount of the error plus the amount of the expanded measurement uncertainty). For values of both error and expanded measurement uncertainty see last calibration certificate of the instrument.

NOTE 2 For vocabulary of metrology see ISO/IEC Guide 99:2007.

5.5 Means of measuring the test pressure applied across the test specimen, within an accuracy of ± 5 %.

5.6 A spraying system capable of applying a continuous regularly dispersed film of water, all over the surface likely to be wetted in real exposure conditions, by means of full circular cone nozzles with the flowing features:

a) angle of spray: $\left(120_{-10}^{0}\right)°$;

b) pressure working range: 2 bar to 3 bar according to manufacturer's specifications;

c) nozzle rate: top row (2 ± 0,2) l/min per nozzle, additional rows (1 ± 0,1) l/min per nozzle and (2 ± 0,2) l/min per nozzle (see 6.2.5).

6 Preparation of test specimen

6.1 Set-up of the test specimen

The test specimen shall be fixed as intended for use without any twists or bends which may influence the test results. The test specimen shall be fully operable. The surround shall be prepared and installed so that any water penetration, including that through the frame joints, shall be readily detectable.

The test specimen shall be cleaned and surfaces dry.

Ventilation devices, if any, shall be taped over.

6.2 Set-up spraying system (see Figures A.1 to A.6)

6.2.1 General

The method of spraying (Method A or Method B) shall be chosen by the manufacturer based on the location of the test specimen in the intended works (shielded or not)A test shall be carried out using only one set up. A template is recommended to set up the spraying system.

6.2.2 Positioning of the line connecting the nozzle tips (the nozzle line)

The nozzle line shall be located not more than 150 mm above the topmost horizontal joint line of any moving frame or the glazing line of any fixed glazing, in order to provide complete wetting of the adjacent horizontal frame member(s).The nozzle line shall be located at a distance of $\left(250^{+10}_{0}\right)$ mm from the external face of the test specimen as defined by the outermost external joint plane of moving parts or the glazing plane of fixed parts.

6.2.3 Positioning relative to test specimen width

Nozzles shall be spaced at (400 ± 10) mm along the axis of the spray bar and the nozzles shall be arranged in order that the lateral distance „c“ between the outer edge of the surround and the outermost nozzles shall be greater than 50 mm but not exceeding 250 mm (see Figure A.6).

6.2.4 Direction of nozzle spray

The nozzle axis shall lie on a line $\left(24^{+2}_{0}\right)°$ below the horizontal line for test according to Method 1A, and (84 ± 2)° for test according to Method 1B (see Figures A.1 and A.2).

6.2.5 Number of nozzle rows

6.2.5.1 For test specimens with a height up to 2,5 m, including e.g. extension profiles and/or shutter boxes (see Figure A.5) a single row of nozzles shall be used, with each nozzle spraying, on average, 2 l/min for spraying Method 1A and spraying Method 1B.

NOTE The prescribed spraying rates above are appropriate for 2,5 m high test specimen. For smaller test specimen the nozzles spray water beyond the sill, hence the actual flow on the sprayed area is approximately

— 2 l/(min·m^2) when test is carried out according to Method 1A,

— 1 l/(min·m^2) when test is carried out according to Method 1B.

6.2.5.2 For test specimens exceeding 2,5 m height (see Figures A.3 and A.4), including e.g. extension profiles and/or shutter boxes (see Figure A.5), an upper row of nozzles shall be fixed as described in 6.2.5.1. Additional rows of nozzles shall be fixed at vertical intervals at 1,5 m (within a tolerance of ± 150 mm) below the top nozzle line. Where any horizontal projection occurs, these additional rows shall be installed at a level such that no water is sprayed upwards under the projection. The flow of each nozzle shall be on average

— 1 l/min for spraying Method 2A,

— 2 l/min for spraying Method 2B.

6.2.5.3 For test specimens containing one or more horizontal water bars which project more than 50 mm (see Figure A.8) an additional row of nozzles, as described in 6.2.5.2, shall be arranged for each water bar as shown in Figure A.2.

6.3 Water characteristics

Water temperature shall be between 4 °C and 30 °C and the water shall be clean enough to ensure that all nozzles spray correctly.

7 Test procedure

7.1 Preliminaries

The ambient temperature and humidity close to the test specimen shall be within the range of 10 °C to 30 °C and 25 % to 75 % RH and the test specimen shall be conditioned thus for at least 4 h immediately before testing.

Temperature shall be measured to within ± 3 °C and humidity to within ± 5 %. Atmospheric pressure shall be measured to within ± 1 kPa.