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Operating forces - Test method - Part 2: Doors

Bedienungskräfte - Prüfverfahren - Teil 2: Türen

Forces de manoeuvre - Méthode d'essai - Partie 2: Portes

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Doors and windows

oSIST prEN 12046-2:2022

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English Version

Operating forces - Test method - Part 2: Doors

Forces de manoeuvre - Méthode d'essai - Partie 2:
Portes

Bedienungskräfte - Prüfverfahren - Teil 2: Türen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 33.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 12046-2:2022) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 12046-2:2000.

In comparison with the previous edition, the following technical modifications have been made:

- clarification of the test methods;
- extension of the scope to cover doors with emergency or panic exit devices.

This document is one of a series of standards for windows and doors.

The EN 12046 series of standards *Operating forces — Test method* currently consists of:

- Part 1: Windows;
- Part 2: Doors.

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prEN 13123-1:2022 (E)**1 Scope**

This document covers hinged/pivoted and sliding doorsets with engaging fasteners (e.g. latches, deadbolts) for pedestrian use. It defines the test methods to determine the forces to open/close doors and to engage/release and lock/unlock the hardware using a key or handle. It is only applicable to the manual operation of doorsets.

These doorsets may include emergency or panic exit devices.

The method of measuring the operating forces for pedestrian doorsets with self-closing devices engaged are included in this test standard.

NOTE The use of some windows involves engaging fasteners (e.g. latches, deadbolts) and can be tested in accordance with this standard.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 179, *Building hardware - Emergency exit devices operated by a lever handle or push pad, for use on escape routes - Requirements and test methods*

EN 1125, *Building hardware - Panic exit devices operated by a horizontal bar, for use on escape routes - Requirements and test methods*

EN 1154:1996, *Building hardware - Controlled door closing devices - Requirements and test methods*

EN 12519, *Windows and pedestrian doors - Terminology*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1**attachment point**

point adjacent to a single handle and with more than one handle, point midway between the extreme handle positions

4 Principle of test

The principle consists of measuring the minimum force or torque required to engage or disengage the hardware (locks, handles etc.), commence opening and complete closing of the door leaf, sash or casement to the latched position or engagement of any safety device.

5 Test apparatus

5.1 General

The apparatus shall include a support frame into which the specimen shall be mounted using the fixing systems and devices provided or described by the manufacturer. The construction and stiffness of the support frame shall not influence the test result.

Means shall be provided for the application of forces to manipulate the hardware uniformly and without shock.

The test apparatus shall consist of either weights and pulleys (e.g. Annex A, Figure A.1 and Annex B, Figure B.1) or apparatus other than a spring mechanism, with which the force or torque can be smoothly applied. This shall include suitable measuring and recording equipment all capable of providing measurements to an accuracy of 5 %.

5.2 Equipment with weights

Weights shall be used with a cord and a pulley for applying forces. See Figure A.1 and Figure B.2.

The diameter, stiffness and the weight of the cord shall not significantly influence the test result.

Forces shall be applied in increments or gradually without shock.

Alternatively, forces can be gradually increased to reach the maximum force in.

5.3 Actuator and recording device for determining linear forces and torques

A torque meter or suitable device capable of measuring the torques or the linear forces required to operate the mechanism within an accuracy of ± 5 %.

The equipment shall have an attachment for connection to the hardware (handle/key) which will enable correct alignment of the forces and/or torques during test.

The connection between the measuring device and the specimen shall be such as will avoid local damage to the specimen and which shall in no way effect its performance.

6 Test specimen

The specimen shall be fixed as intended for use in the works, without any twist or bends that may influence the test results. The specimen shall be provided for test in fully operable condition.

Sufficient time shall be allowed for the temperature of the specimen to reach that of the test environment.

Testing shall be carried out in an environment within the ranges of 10 °C to 30 °C and 25 % RH to 75 % RH.

7 Procedure for basic operation

7.1 General

Tests shall be preceded by manual operation of all moving parts five times before commencing with the test.

prEN 13123-1:2022 (E)**7.2 Procedure for determining the closing force****7.2.1 Weight and pulley**

Fasten the cord to the attachment point, lead it over the pulley and fasten the other end to a weight. The weight shall hang freely when the movable parts of the test specimen is closed (see Figure A.1 and Figure B.1).

For hinged and pivoted specimens open the movable part through at the distance that raises the weight 200 mm. For sliding specimens open the movable part through a distance that raises the weight 100 mm. Release the movable part from this position and determine the minimum weight to reach the latched position.

Perform the procedure of opening and closing the specimen three times and average the results to obtain the final value.

7.2.2 For other means of applying the force

Put or fasten the actuator on the attachment point.

For hinged and pivoted specimens open the movable part through at the distance that raises the weight 200 mm. For sliding specimens open the movable part through a distance that raises the weight 100 mm.

Push or pull the movable part from this position and determine the minimum force to reach the latched position.

Perform the procedure of opening and closing the specimen three times and average the results to obtain the final value.

7.3 Procedure for determining the linear force and torque for operating the hardware

The specimen shall be closed and secured (where relevant). Apply within 1 s the force necessary to release the latch, lock and unlock the hardware and record the minimum force and/or torque respectively.

For emergency exit devices, see Figure C.1, Figure C.2 and Figure C.3.

For Test specimen with panic exit devices:

With no thrust on any part of the test door and with the test door in the locked/secured position, the horizontal bar shall be actuated at its midpoint and separately within a maximum of 25^{+10}_0 mm from each end of the operating bar, see Figure C.4 and Figure C.5.

Perform each of these tests at each defined position (see e.g. Annex C) three times and average the results to obtain the final value.

The test shall be performed for each sash separately (active sash / inactive sash) if applicable.

7.4 Procedure for determining the minimum force to commence and maintain the motion

Attach the linear actuator or a weight and pulley system to the test specimen and measure the minimum force to commence and maintain the motion.

When present, the attachment point should be the door knob or handle. For emergency exit doors with hardware according to EN 1125 (horizontal bar), the attachment point shall be of 25 mm from the end of the operating bar on lock side. For doors with hardware according to EN 179 (emergency exit devices operated by a lever handle or push pad), the attachment point shall be opposite of the handle or push pad.

Fasten the actuator or the cord to the attachment point, lead it over the pulley and fasten the other end to a weight. The weight shall hang freely when the movable parts of the test specimen is closed (see Figure D.1).

Locks and latch (or latches) shall be retracted in the “open” position. Latches may be blocked to remain in the open position by tape or otherwise.

For hinged and pivoted specimens, the door leaf shall be in the closed position. Release the movable part from this position and determine the minimum force weight necessary to open the door leaf for a distance of 50 % of the width of the door leaf.

For sliding specimens determine the minimum weight needed to open the movable part from the closed position.

For hinged and pivoted doorsets with door closing devices, the range of 0 to 90 degrees shall be tested, for sliding doors with closing devices, the forces shall be measured for a minimum width of 90 cm.

The highest force required shall be recorded.

Perform this procedure three times and average the results to obtain the final value.

8 Test sequences

8.1 General

Operate all movable part and perform the tests in the following sequence.

8.2 Specimens without self-closing devices

Open the movable part and perform the tests in the following sequence.

— closing force

Follow procedure according to 7.1
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— Operating of the lock

a) locking

b) unlocking

c) unlatching

Follow procedure according to 7.2

— To commence motion

Follow procedure according to 7.3

8.3 Specimens with self-closing devices

Specimens with self-closing devices

Perform the tests in the following sequence.

— Device engaged

Closing forces: No measurement needed

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Determine of minimum forces or torques to operate the hardware.

Follow procedure according to 7.2.

Determine of minimum force to commence motion.

Follow procedure according to 7.3.

— Device disengaged

Follow procedure according to 7.1.

For single action side-hung pedestrian doorsets with self-closing device:

When applying uncontrolled door closing devices the closing moment should be adjusted to the manufacturer's specification. When applying controlled door closing devices the closing moment shall be adjusted according to EN 1154:1996, Table 1. It shall be ensured that the door leafs close in an even, controlled manner.

9 Expression of results

The separate results and averaged values (averaged to two significant figures) shall be recorded.

Forces shall be expressed in Newtons (N) and torques in Newton metres (Nm).

10 Test report

The test report shall include following information:

- a) reference to this European standard;
- b) the name of the testing institute;
- c) the name of the manufacturer requesting the test;
- d) test climates used;
- e) test procedures, including storage and conditioning prior to test, and mounting the test specimen ready for test;
- f) all relevant details to fully describe the test specimen (e.g. building hardware including fixing) and its installation in the test rig;
- g) dimensioned drawings of specimen;
- h) details of glazing or infilling;
- i) the results of the test (separate results and the average for each load, (N) or torque (Nm) shall be recorded);
- j) intended use according to manufacturer's literature;
- k) observation as to the condition of the specimen;
- l) date of test;
- m) date of report.