

# Industrial, commercial and garage doors and gates — Air permeability — Test method

The European Standard EN 12427:2000 has the status of a  
British Standard

ICS 91.060.50

# National foreword

This British Standard is the official English language version of EN 12427:2000.

The UK participation in its preparation was entrusted by Technical Committee B/538, Doors, windows, shutters, hardware and curtain walling, to Subcommittee B/538/5, Industrial, commercial and garage doors and gates, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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## Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 7 and a back cover.

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English version

## Industrial, commercial and garage doors and gates - Air permeability - Test method

Portes équipant les locaux industriels, commerciaux et les  
garages - Perméabilité à l'air - Méthode d'essai

Tore - Luftdurchlässigkeit - Prüfverfahren

This European Standard was approved by CEN on 19 July 2000.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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### Foreword

This European Standard 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of an identical text or by endorsement, at the latest by January 2001, and conflicting national standards shall be withdrawn at the latest by January 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

No existing EN standard is superseded.

This standard is one of a series of test standards identified within the product standard prEN 13 241:1998.

European Standards as well as relevant national regulations and standards will enable the actual exposure levels to be determined for the individual locations of the products.

Annex A is normative.

This standard has been drafted on basis of EN 12114 "Thermal performance of building – Air permeability of building components and building elements – Laboratory test method".

## **1 Scope**

### **1.1 General**

This European Standard specifies a test method for determining the air permeability for doors in a closed position.

The doors are intended for installation in areas in the reach of people, for which the main intended uses are giving safe access for goods, vehicles and persons in industrial, commercial or residential premises.

The doors may be manually or power operated.

This document applies to all doors provided in accordance with prEN 13 241:1998.

### **1.2 Exclusions**

It does not apply to:

- lock gates and dock gates;
- doors on lifts;
- doors on vehicles;
- armoured doors;
- doors mainly for the retention of animals;
- theatre textile curtains;
- horizontally moving doors less than 2,5 m wide and 6,25 m<sup>2</sup> area, designed principally for pedestrian use;
- revolving doors of any size;
- doors outside the reach of people (such as crane gantry fences);
- railway barriers;
- barriers used solely for vehicles.

## **2 Normative References**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 12 433-1	Industrial, commercial and garage doors and gates - Terminology - Part 1: Types of doors
EN 12 433-2	Industrial, commercial and garage doors and gates - Terminology - Part 2: Parts of doors
EN 12 426	Industrial, commercial and garage doors and gates – Air permeability - Classification

prEN 13 241:1998

Industrial, commercial and garage doors and gates -  
Product standard

### 3 Terms and definitions

For the purpose of this standard the terms and definitions in EN 12 433-1 and EN 12 433-2 apply. In addition the following definitions also apply:

- 3.1** Air permeability: ability of a test specimen in relation to the overall area, when in closed position, to allow air flow, expressed in  $\text{m}^3/\text{m}^2 \text{ h}$ .
- 3.2** Overall area: the area of the structural opening of the specimen, expressed in square meters ( $\text{m}^2$ ).

### 4 Principle of test

Application of air pressure (positive or negative) on the external or internal surface of the test specimen whilst a measurement of the airflow is made with a device according to 5 c).

### 5 Apparatus

The basic test apparatus shall include:

- a) an opening to which the test specimen can be fitted, to simulate the structural opening of the product on site.
- b) device(s) to provide controlled air pressure, above atmospheric air pressure, to the exposed surface of the specimen.
- c) device(s) to measure the amount of airflow with an accuracy of  $\pm 5\%$ . It shall be calibrated so as to give airflow in normal conditions ( $20^\circ\text{C}$ ,  $101 \text{ kPa}$ ).
- d) device(s) for measuring air pressure with an accuracy of  $\pm 5\%$ .
- e) a means of sealing all joints of the specimen when required.

NOTE The test rig should not be designed to increase the performance of the specimen.

The test rig shall be prepared so that it is able to withstand the pressures applied during the test, without deflecting to an extent likely to impair jointing or to impose bending stresses.

### 6 Preparation of test specimen

- a) The test specimen shall be installed in accordance with the manufacturer's standard or published installation instructions.
- b) The test specimen shall consist of parts, which in detail conform to the production level of quality. Whenever possible the test specimen should be newly made. Doors and parts in stock are to be regarded as newly made if they fully comply with the specification of the running production.

- c) The test specimen shall be clean and the surfaces dry.
- d) Any ventilation, drainage or "weep holes" shall be taped up or left open according to the purpose of test and this purpose and state shall be noted and recorded. In most cases, air can pass through both fixed and opening joints.
- e) Minimum dimensions of specimen see table 1.

**Table 1 - Minimum dimensions of specimen**

Commercial and garage doors	Width: 2 000 mm Height: 2 000 mm
Industrial doors	Width: 3 500 mm Height: 3 000 mm

## **7 Test procedure**

### **7.1 Preliminaries**

The test specimen shall be conditioned for at least 4 h within the range 10°C to 30°C and 25% to 75% relative humidities immediately before testing.

Temperature shall be measured within  $\pm 3^\circ\text{C}$ .

Atmospheric pressure shall be measured within  $\pm 1$  kPa.

The pressure shall be applied up to 50 Pa.

### **7.2 Procedure**

The residual air permeability shall be measured prior to the specimen test.

The diagrams of pressure sequences given in Annex A may be helpful for a clear understanding.

**7.2.1** Air permeability with positive pressure shall be carried out first.

Negative pressure shall be carried out only if required.

**7.2.2** Air permeability of specimen fitted to the test rig shall be measured.

**7.2.3** The test specimen shall be opened and closed at least once before finally secured in the closed position.

**7.2.4** Apply three air pressure pulses, to position the seals, the rate of application being over a period of not less than one second. Maintain each pulse for at least three seconds.

These pulses shall produce a pressure 10% greater than the maximum pressure  $P_{\max}$  required for the test.

**7.2.5** The air pressure in the test rig is then raised up to 50 Pa.

The duration should be such that air pressure in the test rig is adequately stabilised before reading the value linked to air permeability.

**7.2.6** Calculate the air permeability according to the formula:

$$\frac{\text{Air leakage (m}^3/\text{h)} - \text{Residual air leakage (m}^3/\text{h)}}{\text{Structural opening (m}^2\text{)}}$$

## **8 Test report**

The test report shall state the devices used for the test and also record the location of any air leakage observed, on a drawing or a photograph of the test specimen.

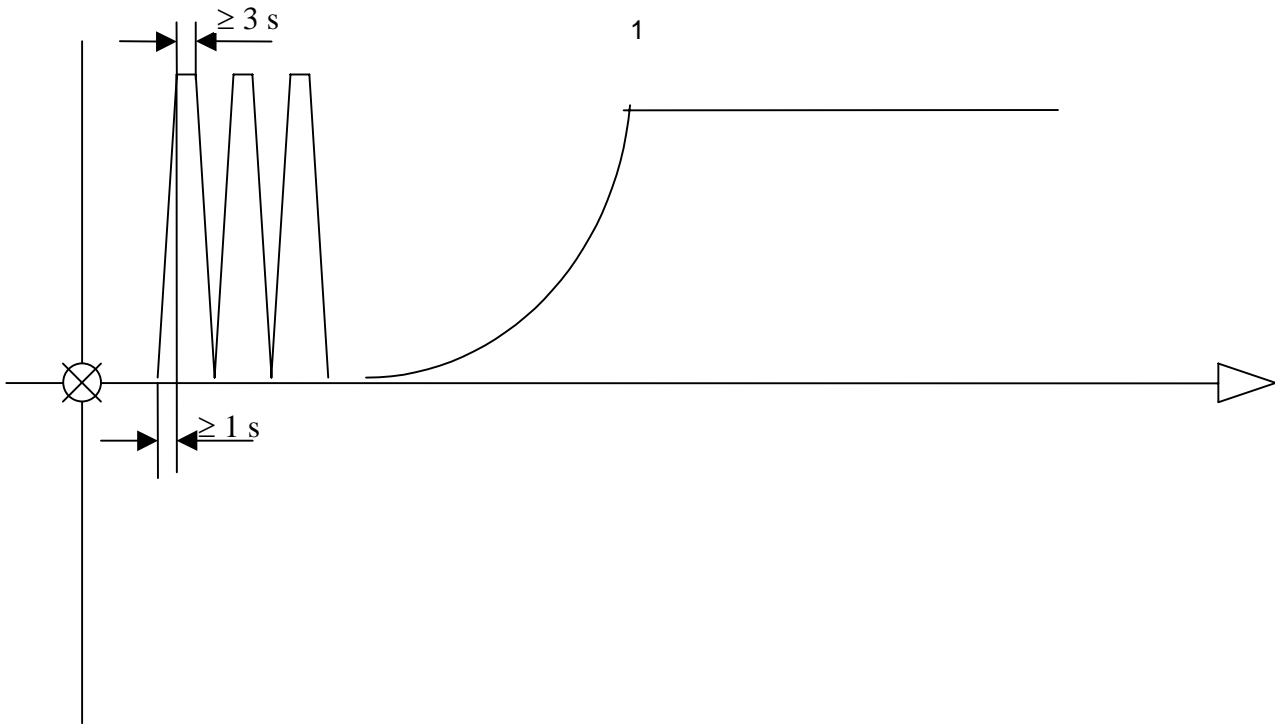
The report shall contain as a minimum the following information:

- a) date of the test report;
- b) reference to this standard;
- c) name of the approved laboratory, if applicable;
- d) all necessary references to identify the specimen;
- e) all relevant details concerning the dimensions of the specimen, its materials, design, construction and manufacture and its finished surface and fittings and also its method of delivery;
- f) drawings of details of the specimen shall be of a suitable scale;
- g) identification of the test equipment;
- h) test method;
- i) test procedures, including storage and conditioning prior to test and mounting the specimen ready for test;
- j) test climates used;
- k) location of air leakage, if detectable;
- l) take the overall area (m<sup>2</sup>) into account when to calculate the specific airflow in m<sup>3</sup>/ m<sup>2</sup>h (see 3.2);
- m) air permeability result;
- n) summary with observations;
- o) determine the classification according to EN 12 426;
- p) signature of the responsible person.




Annex A (normative)

Air pressure sequence for test rig



Key

-  Opening and closing operation
- 1 Stabilized pressure

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