
**Thermal performance of buildings —
Determination of air permeability of
buildings — Fan pressurization method**

*Performance thermique des bâtiments — Détermination de la
perméabilité à l'air des bâtiments — Méthode de pressurisation par
ventilateur*



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Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms, definitions and symbols	1
4 Apparatus	3
5 Measurement procedure	4
6 Expression of results	8
7 Test report	12
8 Uncertainty	13
Annex A (informative) Description of equipment used to pressurize buildings.....	14
Annex B (informative) Dependence of air density on temperature, dew point and barometric pressure	16
Annex C (informative) Recommended procedure for estimating uncertainty in derived quantities	17
Annex D (informative) Beaufort scale for wind force (extract)	20

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 9972 was prepared by Technical Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, Subcommittee SC 1, *Test and measurement methods*.

This second edition cancels and replaces the first edition (ISO 9972:1996), which has been technically revised.

Introduction

The fan-pressurization method is intended to characterize the air permeability of the building envelope or parts thereof. It can be used

- a) to measure the air permeability of a building or part thereof for compliance with a design air-tightness specification;
- b) to compare the relative air permeability of several similar buildings or parts of buildings;
- c) to identify the leakage sources;
- d) to determine the air-leakage reduction resulting from individual retrofit measures applied incrementally to an existing building or part of building.

The fan-pressurization method is suitable for the respective diagnostic purposes. Although the air infiltration and exfiltration cannot be measured directly, the results of this method can also be used to estimate with adequate precision by means of calculation both the mean infiltration through unintended leakages and the mean air flow through intended air flow devices from outside, in relation to the pressure conditions to be expected within the building.

This method does not measure the air-infiltration rate of a building. The results of the fan-pressurization test can be used to estimate the air infiltration by means of calculation. Other methods are applicable when it is desired to obtain a direct measurement of the air infiltration rate. It is better to use the fan-pressurization method for diagnostic purposes and measure the actual infiltration rate with tracer gas methods. A single tracer gas measurement gives limited information on the performance of ventilation and infiltration of buildings.

This method applies to measurements of air flow through the construction from outside to inside or vice versa. It does not apply to air flow measurements from outside through the construction and from other places within the construction back to outside.

The proper use of this International Standard requires a knowledge of the principles of air flow and pressure measurements. Ideal conditions for the test described in this standard are small temperature differences and low wind speeds. For tests conducted in the field, it needs to be recognized that field conditions can be less than ideal. Nevertheless, strong winds and large indoor-outdoor temperature differences should be avoided.

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Thermal performance of buildings — Determination of air permeability of buildings — Fan pressurization method

1 Scope

This International Standard is intended for the measurement of the air permeability of buildings or parts of buildings in the field. It specifies the use of mechanical pressurization or depressurization of a building or part of a building. It describes the measurement of the resulting air flow rates over a range of indoor-outdoor static pressure differences.

This International Standard is intended for the measurement of the air leakage of building envelopes of single-zone buildings. For the purpose of this International Standard, many multi-zone buildings can be treated as single-zone buildings by opening interior doors or by inducing equal pressures in adjacent zones.

It does not address evaluation of air permeability through individual components.

2 Normative references

The following referenced documents are indispensable for the application 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.

ISO 6781, *Thermal Insulation — Qualitative detection of thermal irregularities in building envelopes — Infrared method*

ISO 7345, *Thermal Insulation — Physical quantities and definitions*

ISO 13790:2004, *Thermal performance of buildings — Calculation of energy use for space heating and cooling*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7345 and the following apply.

3.1.1

air leakage rate

air flow rate across the building envelope

NOTE This movement includes flow through joints, cracks and porous surfaces, or a combination thereof, induced by the air-moving equipment used in this standard (see Clause 4).

3.1.2

internal volume

deliberately heated, cooled or mechanically ventilated space within a building or part of a building subject to the measurement, generally not including the attic space, basement space and attached structures