
Prezračevanje stavb - Difuzija zraka - Merjenja v lastni coni klimatizirane/prezračevane sobe za vrednotenje toplotnih in akustičnih razmer

Ventilation for buildings - Air diffusion - Measurements in the occupied zone of airconditioned/ventilated rooms to evaluate thermal and acoustic conditions

Lüftung von Gebäuden - Luftverteilung - Messungen im Aufenthaltsbereich von klimatisierten/belüfteten Räumen zur Bewertung der thermischen und akustischen Bedingungen

Systèmes de ventilation pour les bâtiments - Diffusion d'air - Mesurages dans la zone d'occupation des pièces avec conditionnement d'air ou ventilation afin d'évaluer les conditions thermiques et acoustiques

Ta slovenski standard je istoveten z: EN 15726:2011

ICS:

91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning
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EUROPEAN STANDARD
NORME EUROPÉENNE
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ICS 91.140.30

English Version

Ventilation for buildings - Air diffusion - Measurements in the occupied zone of air-conditioned/ventilated rooms to evaluate thermal and acoustic conditions

Systèmes de ventilation pour les bâtiments - Diffusion d'air
- Mesurages dans la zone d'occupation des pièces avec
conditionnement d'air ou ventilation afin d'évaluer les
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Lüftung von Gebäuden - Luftverteilung - Messungen im
Aufenthaltsbereich von klimatisierten/belüfteten Räumen
zur Bewertung der thermischen und akustischen
Bedingungen

This European Standard was approved by CEN on 4 September 2011.

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Foreword

This document (EN 15726:2011) has been prepared by Technical Committee CEN/TC 156 “Vetnilation for buildings”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by April 2012, and conflicting national standards shall be withdrawn at the latest by April 2012.

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.

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EN 15726:2011 (E)

1 Scope

This European Standard is applicable to measure some parameters of thermal and acoustic comfort (i.e. temperatures, air velocities...) in a room with an air diffusion system.

This European Standard can be used on site or in a lab for full-scale measurements.

This European Standard applies to ventilation or air conditioning systems designed to maintain the comfort conditions in buildings. It is not applicable in the case of systems for the control of industrial or other special process environments.

NOTE In the latter case however, it may be referred to if the system technology is similar to that of the above mentioned ventilation and air conditioning systems.

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.

EN 12599, *Ventilation for buildings — Test procedures and measuring methods for handing over installed ventilation and air conditioning systems*

EN 13182 *Ventilation for buildings — Instrumentation requirements for air velocity measurements in ventilated spaces*

EN 13779, *Ventilation for non-residential buildings — Performance requirements for ventilation and room-conditioning systems*

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prEN 16211, *Ventilation for buildings — Measurement of air flows on-site — methods*

EN ISO 5167-1, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 1: General principles and requirements (ISO 5167-1:2003)*

EN ISO 7726, *Ergonomics of the thermal environment - Instruments for measuring physical quantities (ISO 7726:1998)*

3 Terms and definitions

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

3.1 reference point

point where the measurements are taken

3.2 mean velocity

time average velocity over the whole measuring period

3.3 spatial average velocity

average value of mean velocities taken in several points in the occupied zone

3.4**spatial maximum velocity**

maximum value of mean velocities taken in several points in the occupied zone

3.5**test area**

usually areas designed for human occupancy and defined as a volume of air that is confined by specified horizontal and vertical planes

NOTE 1 The vertical planes are usually parallel with the walls of the room. Usually there is also a limit placed on the height of the occupied zone. Thus, the occupied zone in a room is that space in which the occupants are normally located and where the requirements for the indoor environment shall be satisfied. Definitions are given in EN 13779:2007, 7.2.

NOTE 2 Definition of the occupied zone is dependent on the geometry and the use of the room and should be specified case by case.

[Occupied area, EN 13779, modified]

3.6**occupied zone (for laboratory purpose)**

portion of the treated space geometrically limited to be no closer than 0,15 m to all walls and within a height of 1,8 m above the floor

4 Test set up and conditions**4.1 General**

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Before any test, the air diffusion system shall be checked accordance with EN 12599 so that its performance may be recorded.

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If the system performance does not meet the design criteria, correction shall be considered prior to the continuation of the test. If this is not possible this shall be made clear in the report along with the assumptions made.

4.2 Thermal loads

The room should be occupied according to its expected use or thermal loads have to be simulated. This should include all internal and external loads (occupants, lights, equipment...). For on site measurements internal and external loads should be reported (actual or simulated).

4.3 Furniture

Furniture, curtains, absorbent surfaces, etc. can influence thermal or acoustic characteristics and should therefore be as representative as possible.

4.4 Other conditions

Operational conditions of system running (VAV, fan speed, variable geometry...) and environmental conditions do have influence on results and have to be reported according to Annex A.

Conditions must be stabilised as much as possible during the test. For instance, supply temperature and reference point temperature should be checked regularly and should not vary during the test by more than +/- 1 K. If this is not possible then the variation shall be recorded.

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5 Methodology

5.1 Sampling in a room

The reference point will be situated in the centre of the test area at a height of 1,1 m. Large areas may be divided into smaller parts, usually recommended to be less than or equal to 20 m² (EN 12599). In this case, each smaller part shall be treated as a test area

There should be enough area to ensure a correct representation of the overall and local air diffusion. It is recommended that the test area takes into account several diffusers jets in order to cover the effect of jet interaction.

5.2 Measurements

5.2.1 General

Different levels of measurements can be used:

- Level 1: easy and quick check at the reference point(s).
- Level 2: more detailed check. Level 1 tests have to be performed first.

For each level, required measurements are indicated in Table 1.

Table 1 — Measurements required
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	Level 1	Level 2
Airflow rate	Smoke test or any other jet visualisation (5.2.2.1)	Measurement (5.2.2.2)
Velocities		Measurement (5.2.3.2)
Temperatures	At reference point (5.2.4.2)	Measurement (5.2.4.3)
Sound pressure level	Overall dB(A) level at the reference point, or any other point where the highest sound level can be expected. (5.2.5.1)	Octave band in order to recalculate any criteria (dB(A), dB(C), NR...) asked (5.2.5.2)

If required

Ventilation Efficiency		see Annex E
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5.2.2 Airflow rate

5.2.2.1 Level 1: Jet visualisation

Jet shall be visualised either by smoke test or by any other means

The objective of the visualisation is:

- to determine the air flow pattern in the occupied zone;
- to detect possible high velocity areas;

— to detect possible dead zones;

Examples of common flow patterns are given in Annex B.

5.2.2.2 Level 2: Airflow rate measurements

Any method described either in prEN 16211, EN 12599 or EN ISO 5167-1 (lab measurements) shall be used for the determination of airflow rates. Both supply and extract airflow rates shall be determined if applicable.

Results have to be compared to designed values and, if not appropriate, ventilation system shall be adjusted before continuing measurements.

5.2.3 Velocities in the occupied zone

5.2.3.1 Level 1

No measurements are required. Flow visualisation as in 5.2.2.

5.2.3.2 Level 2: measurements

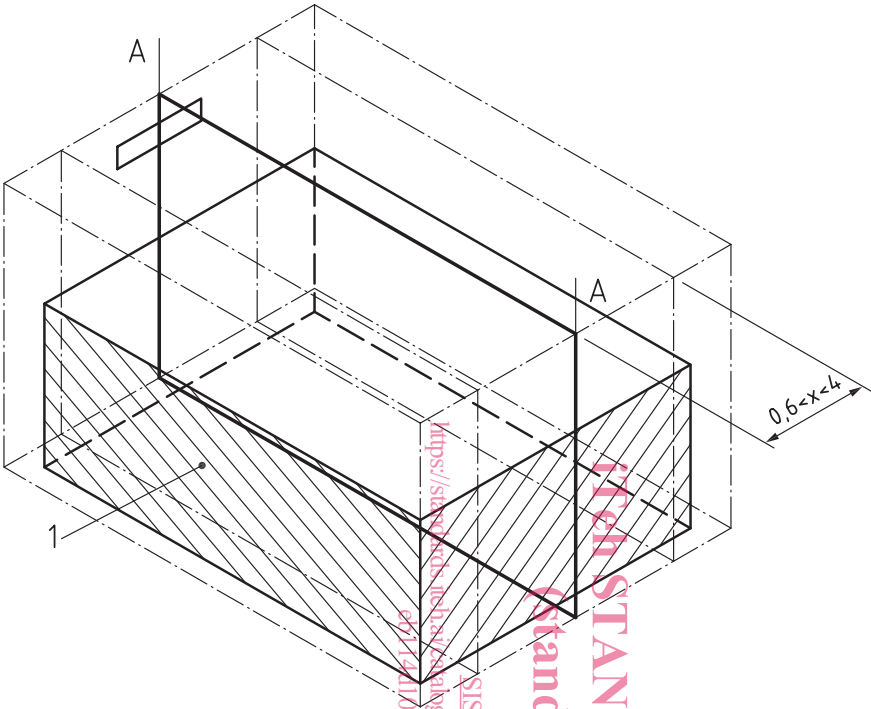
The measurements of low velocities within treated spaces shall be made with a measuring device in accordance with EN 13182.

Air velocities should be measured in enough points in the occupied zone to determine the velocity field in the occupied zone. To this end, two or more planes of measurements shall be chosen according to Figure 1 to Figure 5. One plane has to be perpendicular to the diffuser and centred on it. Test planes must be evenly distributed in the occupied zone and spaced with a distance between 0,6 m and 4 m. They are limited by the occupied zone and shall be representative of standard occupation of the room.

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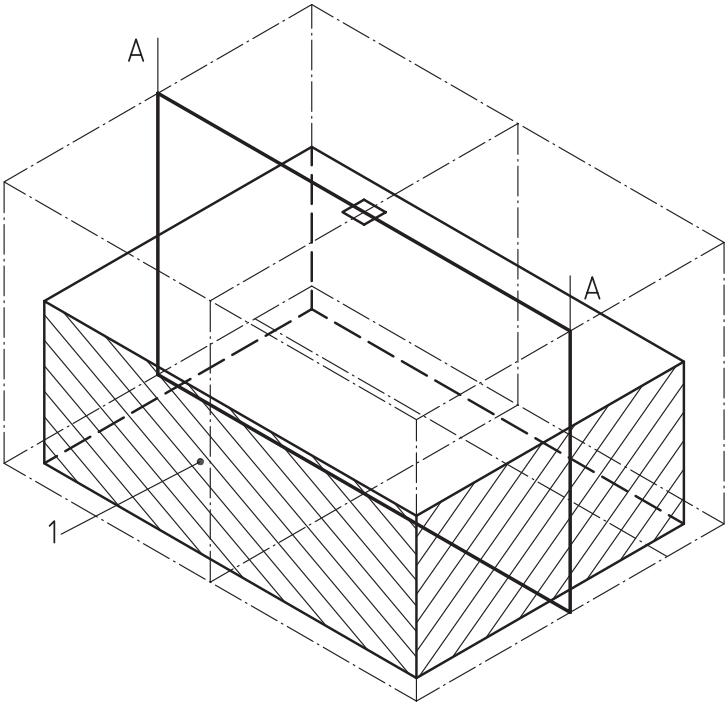
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All dimensions in metres



1 Occupied zone

Figure 1 — Diffuser on the wall – example of test planes



Key
1 Occupied zone

Figure 2 — Diffuser on the ceiling – example of test planes

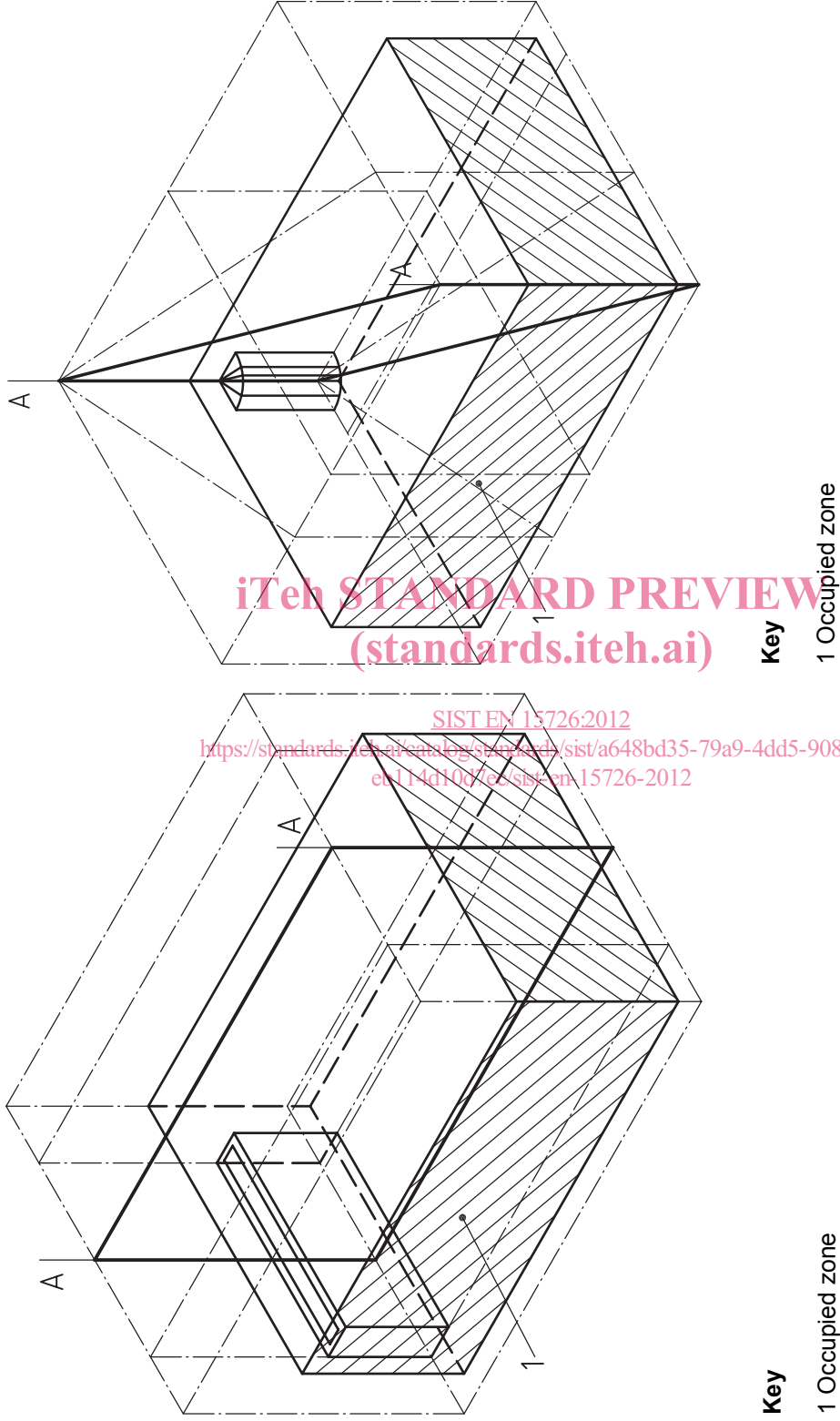


Figure 3 — Diffuser (or fan coil) in window or floor position – example of test planes

Figure 4 — Diffuser in a corner – example of test planes