SLOVENSKI STANDARD
SIST EN ISO 5802:2009

01-april-2009

Industrijski ventilatorji - Preskušanje lastnosti na mestu (ISO 5802:2001)

Industrial fans - Performance testing in situ (ISO 5802:2001)

Ventilateurs industriels - Essai de performance in situ (ISO 5802:2001)

Ta slovenski standard je istoveten z: **EN ISO 5802:2008**

ICS:

23.120	Zraļ niki. Vetrniki. Klimatske naprave	Ventilators. Fans. Air-conditioners

SIST EN ISO 5802:2009 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 5802

October 2008

ICS 23.120

English Version

Industrial fans - Performance testing in situ (ISO 5802:2001)

Ventilateurs industriels - Essai de performance in situ (ISO 5802:2001)

This European Standard was approved by CEN on 2 October 2008.

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

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Ref. No. EN ISO 5802:2008: E

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Foreword

The text of ISO 5802:2001 has been prepared by Technical Committee ISO/TC 117 “Industrial fans” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 5802:2008 by Technical Committee CEN/TC 156 “Ventilation 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of an identical text or by endorsement, at the latest by April 2009, and conflicting national standards shall be withdrawn at the latest by April 2009.

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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Endorsement notice

The text of ISO 5802:2001 has been approved by CEN as a EN ISO 5802:2008 without any modification.

INTERNATIONAL STANDARD

ISO 5802

First edition
2001-07-15

Industrial fans — Performance testing *in situ*

Ventilateurs industriels — Essai de fonctionnement in situ

Reference number
ISO 5802:2001(E)

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Printed in Switzerland

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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 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 5802 was prepared by Technical Committee ISO/TC 117, *Industrial fans*.

Annexes A to E form a normative part of this International Standard.

Introduction

The need to revise existing methods of site testing has been apparent for some time. Bearing in mind the extent of these revisions, it was felt appropriate to expand the method of site testing into a "stand-alone" document. This would enable the velocity area methods to be fully detailed for all commonly encountered airway cross-sections. It would also allow the addition of descriptive annexes covering the selection of suitable measuring stations and instrument calibration.

In accordance with recent International agreements, it will be noted that fan pressure is now defined as the difference between stagnation pressure at the fan inlet and outlet. Stagnation pressure is the absolute pressure which would be measured at a point in a flowing gas if it were brought to rest isentropically. For Mach numbers less than 0,2 the gauge stagnation pressure is within 0,6 % of the total pressure.

Less emphasis is placed on the use of "fan static pressure" as this is a conventional quantity only. It is to be anticipated that its use will cease with time. All fluid losses are essentially losses in stagnation pressure and this has been reflected in the definitions now specified.

It should be recognized that the performance of a fan measured under site conditions will not necessarily be the same as that determined from tests using standardized airways. The reasons for such differences are not only due to the inherently lower accuracy of a site test, but also due to the so-called "system effect factor" or "installation effect", where the ducting connections at fan inlet and/or outlet modify its performance. The need for good connections cannot be understated. This International Standard specifies the use of "common parts" immediately adjoining the fans for the consistent determination of pressure and also to ensure that air/gas is presented to the fan as a symmetrical velocity profile free from swirl and undue distortion. Only if these conditions are met, will the performance under site conditions equate with those measured in standardized airways.

It should also be noted that this International Standard specifies the positioning of velocity-area measuring points according to log-Tchebycheff or log-linear rules. Arithmetic spacing can lead to considerable error unless a very high number of point readings are taken. (These would then have to be plotted graphically and the area under the curve obtained using planimetry. The true average velocity would be this area divided by the dimensional ordinates).

It is outside the scope of this International Standard to assess the additional uncertainty where the lengths of straight duct either side of the measuring station are less than those specified in annex C. Guidance is, however, given in ISO/TR 5168 and ISO 7194, from which it will be seen that where a significant radial component exists, uncertainties can considerably exceed the normally anticipated 4 % at 95 % confidence levels.

Industrial fans — Performance testing *in situ*

1 Scope

This International Standard specifies tests for determining one or more performance characteristics of fans installed in an operational circuit when handling a monophase fluid.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 5167-1:1991, *Measurement of fluid flow by means of pressure differential devices — Part 1: Orifice plates, nozzles and Venturi tubes inserted in circular cross-section conduits running full.*

ISO 5801:1997, *Industrial fans — Performance testing using standardized airways.*

IEC 60034-1, *Rotating electrical machine — Part 1: Rating and performance.*

IEC 60051-8, *Direct acting indicating analogue electrical measuring instruments and their accessories — Part 8: Special requirements for accessories.*

3 Terms, definitions and symbols

3.1 Terms and definitions

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

The quantities referred to are time-averaged mean values. Fluctuations which affect the quantities being measured may be accounted for by repeating measurements at appropriate time intervals. Mean values may then be calculated which are taken as the steady-state value.

3.1.1
air
air or other gas, except when specifically referred to as atmospheric air

3.1.2
standard air
atmospheric air having a density of exactly 1,2 $kg \cdot m^{-3}$

NOTE Atmospheric air at a temperature of 16 °C, a pressure of 100 000 Pa and a relative humidity of 65 %, has a density of 1,2 $kg \cdot m^{-3}$, but these conditions are not part of the definition.

3.1.3
fan
rotary machine which maintains a continuous flow of air at a pressure ratio not normally exceeding 1,3

3.1.4
impeller
rotating part of a fan which, by means of its blades, transfers energy to the air

3.1.5
casing
those stationary parts of a fan which direct the flow of air from the fan inlet opening(s) to the fan outlet opening(s)

3.1.6
duct
airway in which the air velocity is comparable with that at the fan inlet or outlet

3.1.7
chamber
airway in which the air velocity is small compared with that at the fan inlet or outlet

3.1.8
transition piece
section
airway along which there is a gradual change of cross-sectional area and/or shape

3.1.9
test enclosure
room, or other space protected from draught, in which the fan and test airways are situated

3.1.10
area of the conduit section
A_x
area of the conduit at section x

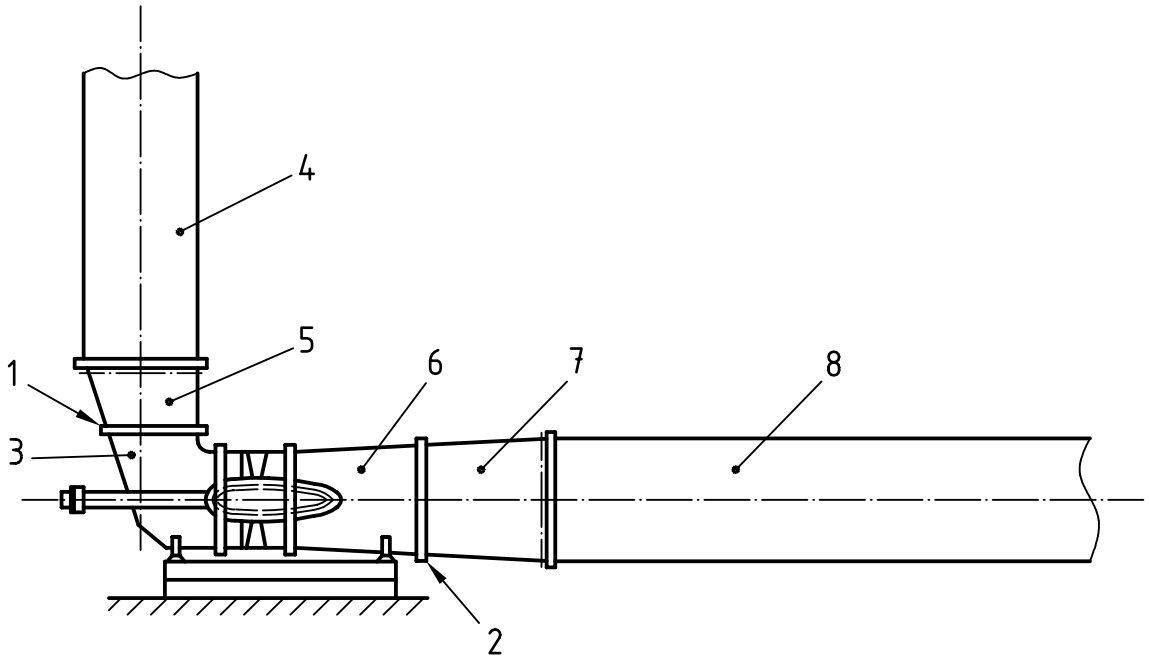
3.1.11
fan inlet area
A_1
by convention, the gross area in the inlet plane inside the casing

NOTE The fan inlet plane should be taken as that surface bounded by the upstream extremity of the air moving device. In this International Standard the fan inlet plane is indicated by plane 1 (see Figure 1).

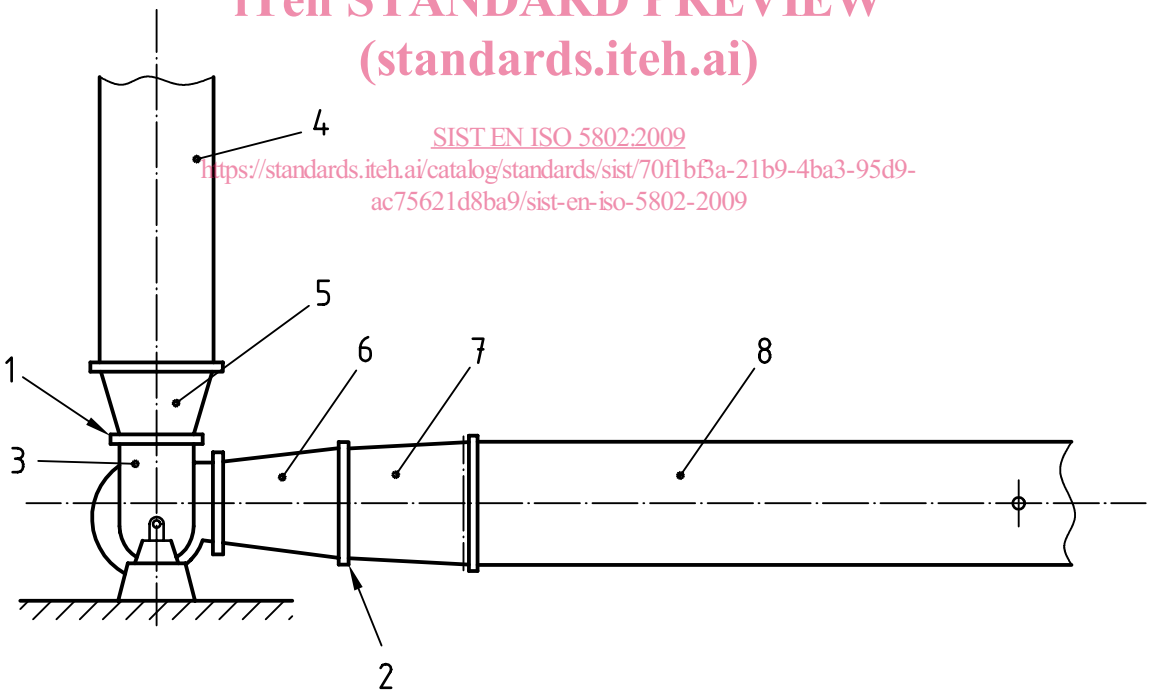
3.1.12
fan outlet area
A_2
by convention, the gross area in the outlet plane inside the casing without deduction for motors, fairings or other obstructions

NOTE The fan outlet plane should be taken as that surface bounded by the downstream extremity of the air moving device. In this International Standard the outlet is indicated by plane 2 (see Figure 1).

3.1.13
temperature
t
air or fluid temperature measured by a temperature sensor



a) Axial fan



b) Centrifugal fan

Key

1	Plane 1	5	Transition
2	Plane 2	6	Diffuser
3	Inlet box	7	Transition
4	Inlet duct	8	Outlet duct

Figure 1 — Location of pressure measurement planes for site testing