



# SLOVENSKI STANDARD SIST EN ISO 5801:2009

01-april-2009

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**Industrijski ventilatorji - Preskušanje lastnosti s standardiziranimi zračnimi cevkami (ISO 5801:2007)**

Industrial fans - Performance testing using standardized airways (ISO 5801:2007)

Einführendes Element - Haupt-Element - rrrrr Ergänzendes Element (ISO 5801:2007)

Ventilateurs industriels - Essais aérauliques sur circuits normalisés (ISO 5801:2007)

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**Ta slovenski standard je istoveten z: EN ISO 5801:2008**

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23.120

Zračniki. Vetrniki. Klimatske  
naprave

Ventilators. Fans. Air-  
conditioners

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN ISO 5801**

October 2008

ICS 23.120

English Version

**Industrial fans - Performance testing using standardized airways  
(ISO 5801:2007 including Cor 1:2008)**

Ventilateurs industriels - Essais aérauliques sur circuits  
normalisés (ISO 5801:2007, Cor 1:2008 inclus)

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## Foreword

The text of ISO 5801:2007 including Cor 1:2008 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 5801:2008 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of an identical text or by endorsement, at the latest by April 2009, and conflicting national standards shall be withdrawn at the latest by April 2009.

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# INTERNATIONAL STANDARD

# ISO 5801

Second edition  
2007-12-15

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## Industrial fans — Performance testing using standardized airways

*Ventilateurs industriels — Essais aérauliques sur circuits normalisés*

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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 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 5801 was prepared by Technical Committee ISO/TC 117, *Industrial fans*.

This second edition cancels and replaces the first edition (ISO 5801:1997), which has been technically revised.

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## ISO 5801:2007(E)

## Introduction

This International Standard is the result of almost 30 years of discussion, comparative testing and detailed analyses by leading specialists from the fan industry and research organizations throughout the world.

It was demonstrated many years ago that the codes for fan performance testing established in different countries do not always lead to the same results.

The need for an International Standard has been evident for some time and Technical Committee ISO/TC 117 started its work in 1963. Important progress has been achieved over the years and, although the International Standard itself was not yet published, the successive revisions of various national standards led to much better agreement among them.

It has now become possible to complete this International Standard by agreement on certain essential points. It must be borne in mind that the test equipment, especially for large fans, is very expensive and it was necessary to include in this International Standard many setups from various national codes in order to authorize their future use. This explains the sheer volume of this document.

Essential features of this International Standard are as follows:

### a) Categories of installation

Since the connection of a duct to a fan outlet and/or inlet modifies its performance, it has been agreed that four standard installation categories should be recognized (see 18.2).

A fan adaptable to more than one installation category will have more than one standardized performance characteristic. Users should select the installation category closest to their application.

### b) Common parts

The differences obtained by testing the same fan according to various test codes depend chiefly on the flow pattern at the fan outlet and, while often minor, can be of substantial significance. There is general agreement that it is essential that all standardized test airways to be used with fans have portions in common adjacent to the fan inlet and/or outlet sufficient to ensure consistent determination of fan pressure.

Geometric variations of these common segments are strictly limited.

However, conventional agreement has been achieved for some particular situations:

- 1) For fans where the outlet swirl is less than 15°, i.e. centrifugal, cross-flow or vane-axial fans, it is possible to use a simplified outlet duct without straightener when discharging to the atmosphere or to a measuring chamber. If there is any doubt about the degree of swirl, then a test should be performed to establish how much is present.
- 2) For large fans (outlet diameter exceeding 800 mm), it may be difficult to carry out the tests with standardized common airways at the outlet including a straightener. In this case, by mutual agreement between the parties concerned, the fan performance may be measured using a duct of length  $3D$  on the outlet side. Results obtained in this way may differ to some extent from those obtained using the normal category D installation, especially if the fan produces a large swirl. Establishment of a possible value of differences, is still a subject of research.

**c) Calculations**

Fan pressure is defined as the difference between the stagnation pressure at the outlet of the fan and the stagnation pressure at the inlet of the fan. The compressibility of air must be taken into account when high accuracy is required. However, simplified methods may be used when the reference Mach number does not exceed 0,15.

A method for calculating the stagnation pressure and the fluid or static pressure in a reference section of the fan, which stemmed from the work of the ad hoc group of Subcommittee 1 of ISO/TC 117, is given in Annex C.

Three methods are proposed for calculation of the fan power output and efficiency. All three methods give very similar results (difference of a few parts per thousand for pressure ratios equal to 1,3).

**d) Flow rate measurement**

Determination of flow rate has been completely separated from the determination of fan pressure. A number of standardized methods may be used.

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