Tööstuslikud ventilaatorid. Töökarakteristikute kohapealne katsetamine

Industrial fans - Performance testing in situ

EESTI STANDARDIKESKUS
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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 5802:2008 sisaldab Euroopa standardi EN ISO 5802:2008 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 5802:2008 consists of the English text of the European standard EN ISO 5802:2008.
Standard on kinnitatud Eesti Standardikeskuse 15.12.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 15.12.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 22.10.2008.	Date of Availability of the European standard text 22.10.2008.
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Ventilateurs industriels - Essai de performance in situ (ISO 5802:2001)

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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of an identical text or by endorsement, at the latest by April 2009, and conflicting national standards shall be withdrawn at the latest by April 2009.

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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.

Contents

Page

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.