BS EN ISO 13350:2015

BSI Standards Publication

Fans — Performance testing of jet fans

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National foreword

This British Standard is the UK implementation of EN ISO 13350:2015. It supersedes BS EN ISO 13350:2008/BS 848-10:1999 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MCE/17, Fans.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Fans - Performance testing of jet fans (ISO 13350:2015)

Ventilateurs - Essai de performance des ventilateurs accélérateurs (ISO 13350:2015)

Ventilatoren - Leistungsmessung von Strahlventilatoren (ISO 13350:2015)

This European Standard was approved by CEN on 21 February 2015.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN ISO 13350:2015) has been prepared by Technical Committee ISO/TC 117 "Fans" in collaboration with 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of an identical text or by endorsement, at the latest by April 2016, and conflicting national standards shall be withdrawn at the latest by April 2016.

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.

This document supersedes EN ISO 13350:2008.

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Endorsement notice

The text of ISO 13350:2015 has been approved by CEN as EN ISO 13350:2015 without any modification.

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 117, *Fans*.

This second edition cancels and replaces the first edition (ISO 13350:1999) which has been technically revised. The main changes are the following:

— General (dated references on standards updated, e.g. ISO 5801:2007);

— *Clause 2* *"Normative references"* (references supplemented and updated);

— *Clause 3* *"Terms and definitions"* (addition of 3.2.1 "gross fan outlet area", 3.5.1 "motor input power", 3.5.2 "impeller power", 3.8.2 "thrust/motor input power ratio");

— *Figure 1* *"Gross and effective fan outlet areas"* (modified by marking of "gross fan outlet area A_2");

— *Clause 4* *"Symbols and abbreviated terms"* (supplemented and updated);

— *6.4* *"Input power"* (correction for density);

— *7.1* *"Determination of thrust"* (correction for density);

— *7.4* *"Test procedures"* (change of recommended calibration intervals);

— *Figure 7* *"Thrust measuring enclosure"* (modified by reducing the minimum distance between fan casing and floor/ceiling/wall);

— *8.1* *"Determination of sound level"* (Introduction of possibility to use other International Standards e.g. ISO 13347);

— *8.3* *"Enclosure suitability"* (requirement on running speed of the reference sound source deleted);

— *9.2* *"Test arrangement" for determination of vibration velocity* (Figure 9 "Vibration measuring position for jet fans" and requirement to use this configuration deleted);

— *9.3* *"Test procedure"* (general reference to ISO 14695);

— *10.2 "Upstream chamber method"* ("venturi nozzle" replaced by "bellmouth");

— *10.4 "Directly connected flowrate-measuring"* ("venturi nozzle" replaced by "bellmouth");

— *11.2 "Product performance"* (reference to density 1,2 kg/m^3 added);

— *Annex C (informative)* (change of title: "Conversion rules" replaced by "Non-dimensional coefficients");

— *Annex C (informative)* (several character changed);

— *Annex C (informative)* (subclause on "Non-dimensional thrust/power ratio" added);

— *Annex D (normative)* (new normative Annex on "Efficiency based on thrust measurements").

Introduction

The need for a new edition of ISO 13350 has been evident for some time. The use of the so-called jet fan to assist in the control of quality of air in vehicle and train tunnels has become increasingly popular. Longitudinal methods of ventilation can show advantages in both capital cost and running cost compared to alternative systems. Smoke and pollution control in emergency conditions can be readily provided. Jet fans can also be used for ventilation and smoke control in enclosed car parks.

This International Standard deals with the determination of those performance criteria essential to the correct application of jet fans. In describing the test and rating procedures, numerous references are made to ISO 5801 as well as to other relevant International Standards.

INTERNATIONAL STANDARD **ISO 13350:2015(E)**

Fans — Performance testing of jet fans

1 Scope

This International Standard deals with the determination of those technical characteristics needed to describe all aspects of the performance of jet fans as defined in ISO 13349. It does not cover those fans designed for ducted applications, nor those designed solely for air circulation, e.g. ceiling fans and table fans.

The test procedures described in this International Standard relate to laboratory conditions. The measurement of performance under on-site conditions is not included.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1940-1, *Mechanical vibration — Balance quality requirements for rotors in a constant (rigid) state — Part 1: Specification and verification of balance tolerances*

ISO 3744, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane*

ISO 5801:2007, *Industrial fans — Performance testing using standardized airways*

ISO 13347 (all parts), *Industrial fans — Determination of fan sound power levels under standardized laboratory conditions*

ISO 13349, *Fans — Vocabulary and definitions of categories*

ISO 14694, *Industrial fans — Specifications for balance quality and vibration levels*

ISO 14695, *Industrial fans — Method of measurement of fan vibration*

IEC 60034-2-1, *Rotating electrical machines — Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)*

IEC 60034-14, *Rotating electrical machines — Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher — Measurement, evaluation and limits of the vibration severity*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13349, ISO 5801 and the following apply.

3.1
effective fan dynamic pressure
p_d
conventional quantity representative of the dynamic component of the fan output, calculated, in the particular case of a jet fan, from the effective fan outlet velocity and the inlet density

Note 1 to entry: The effective fan dynamic pressure will not be the same as the average of the dynamic pressures across the section because it excludes from consideration that part of the dynamic energy flux, which is due only to departures from uniform axial velocity distribution.