International

ISO 13347-3

Fans — Determination of fan sound power levels under standardized laboratory conditions —

Part 3: Enveloping surface methods

Ventilateurs — Détermination des niveaux de puissance acoustique des ventilateurs dans des conditions de laboratoire standardisées —

Partie 3: Méthodes de la surface enveloppante

Second edition
2026-03

Reference number
ISO 13347-3:2026(en)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Foreword ..... **iv**

Introduction ..... **v**

1 Scope **1**

2 Normative references **1**

3 Terms, definitions and symbols **2**
3.1 Terms and definitions 2
3.2 Symbols and units 2

4 Acoustic environment and ducting **2**
4.1 General 2
4.2 Test installation 3
4.2.1 General 3
4.2.2 Installation category A 4
4.2.3 Installation category B 4
4.2.4 Installation category C 4
4.2.5 Casing sound power, Installation category D 4
4.2.6 Installation category E 4
4.2.7 Ducted small fans 5
4.2.8 End Reflection correction 5
4.3 Fan-powered exhaust ventilators 5
4.4 Drive and transmission noise 5

5 Determination of measurement surface **5**
5.1 General 5
5.2 Measurement surfaces 6
5.3 Arrangement of measuring points (rectangular parallelepiped) (installation category A to E) 6
5.4 Arrangement of measuring points (large sphere or hemisphere) 9
5.4.1 General 9
5.4.2 Hemispherical measurement surface (installation category A and category E) 9
5.4.3 Characteristic dimension $\boldsymbol{D_0}$ (installation categories B, C and D) 9
5.4.4 Hemispherical and spherical measurement surfaces (installation categories B, C and D) 10
5.4.5 Location of microphone positions 10
5.5 Arrangement of measuring points (small hemisphere) 15

6 Test method **18**

7 Acoustic tests: determination of sound power level **18**
7.1 General 18
7.2 Calculation 19
7.2.1 Calculation of surface sound pressure level 19
7.2.2 Calculation of sound power level 19
7.3 Uncertainty of measurements 19

Annex A (normative) **Determination of environmental correction** K_2 ..... **20**

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 117, *Fans*.

This second edition cancels and replaces the first edition (ISO 13347-3:2004), which has been technically revised. It also incorporates the Technical Corrigendum ISO 13347-3:2004/Cor 1:2006 and the Amendment ISO 13347-3:2004/Amd 1:2010.

The main changes are as follows:

— inclusion of acoustic methods for installation category E fans;

— symbols have been harmonized with those used in ISO 5801 and other ISO documents listed in the Normative references;

— editorial corrections have been incorporated.

A list of all parts in the ISO 13347 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This document gives a method for determining the sound power level of a fan. The method is reproducible in all laboratories which are qualified according to the requirements of this document.

The method employs standard sound measurement instrumentation, applied to rooms which are restricted in certain acoustic properties. The test set-ups are generally designed to represent the physical orientation of a fan as installed, in accordance with ISO 5801 or ISO 13350.

Since sound power levels are considered independent of the acoustic environment around the fan, a good comparison can be made between two or more fans proposed for any specific air performance condition. Moreover, these values establish an accurate base for estimating the acoustical outcome of the fan installation in terms of sound pressure levels. A successful estimate of sound pressure levels requires extensive information on the fan and the environment in which it is to be located.

It is often advantageous for the equipment user to employ acoustical consultation to ensure that all factors affecting final sound pressure levels are considered. More detailed information on the complexity of this situation can be found in acoustic text books.