

Industrial fans — Determination of fan sound power levels under standardized laboratory conditions —

Part 3: Enveloping surface method

ICS 17.140.20; 23.120

National foreword

This British Standard is the UK implementation of ISO 13347-3:2004+A1:2010, incorporating corrigendum November 2006. It supersedes BS ISO 13347-3:2004, which is withdrawn.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags **[AC]** **<AC>**. Text altered by ISO corrigendum November 2006 is indicated in the text by **[AC1]** **<AC1>**.

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

A list of organizations represented on MCE/17 can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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**Industrial fans — Determination of fan
sound power levels under standardized
laboratory conditions —**

**Part 3:
Enveloping surface methods**

*Ventilateurs industriels — Détermination des niveaux de puissance
acoustique des ventilateurs dans des conditions de laboratoire
normalisées —*

Partie 3: Méthodes de la surface enveloppante



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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 13347-3 was prepared by Technical Committee ISO/TC 117, *Industrial fans*.

ISO 13347 consists of the following parts, under the general title *Industrial fans — Determination of fan sound power levels under standardized laboratory conditions*:

- *Part 1: General overview*
- *Part 2: Reverberant room method*
- *Part 3: Enveloping surface methods*
- *Part 4: Sound intensity method*

Introduction

This part of ISO 13347 establishes 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 part of ISO 13347.

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.

Since sound power levels are considered independent of the acoustic environment around the fan, a good comparison may 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 which affect the final sound pressure levels are considered. More detailed information on the complexity of this situation may be found in acoustic text books.

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Part 3: Enveloping surface methods

1 Scope

This part of ISO 13347 applies to industrial fans as defined in ISO 5801 and ISO 13349. It is limited to the determination of airborne sound emission for the specified set-ups. Vibration is not measured, nor is the sensitivity of airborne sound emission to vibration effects determined.

The sizes of fan which can be tested in accordance with this part of ISO 13347 are limited only by the practical aspects of the test set-up. Dimensional limitations, test fan dimensions, and air performance will control the room size, power and mounting requirements for the test fan. (Small fans may be tested according to this part of ISO 13347 or to ISO 10302, according to usage).

The test arrangements in this part of ISO 13347 establish the laboratory conditions necessary for a successful test. Rarely will it be possible to meet these requirements in situ and this part of ISO 13347 is not intended for field measurements. Intending users are reminded that, in these situations, there may well be additional acoustic system effects where inlet and outlet conditions at the fan are less than ideal.

The enveloping surface methods may be used for the determination of open inlet and/or open outlet sound power level of fans for the standardized installation types given in 3.1.

An estimation (with increased uncertainty) of ducted sound power for fans too small, or otherwise inconvenient, for testing by the in-duct method described in ISO 5136 may also be obtained by the addition of end reflection corrections (see Annex C of ISO 13347-1:2004).

2 Normative references

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

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

ISO 5136, *Acoustics — Determination of sound power radiated into a duct by fans and other air-moving devices — In-duct method*

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

ISO 10302, *Acoustics — Method for the measurement of airborne noise omitted by small air-moving devices*

ISO 13347-1:2004, *Industrial fans — Determination of fan sound power levels under standardized laboratory conditions — Part 1: General overview*

ISO 13349, *Industrial fans — Vocabulary and definitions of categories*