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## **Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for small movable sources in reverberant fields**

### **Part 1: Comparison method for a hard-walled test room**

*Acoustique — Détermination des niveaux de puissance et d'énergie acoustiques émis par les sources de bruit à partir de la pression acoustique — Méthodes d'expertise en champ réverbéré applicables aux petites sources transportables*

*Partie 1: Méthode par comparaison en salle d'essai à parois dures*



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## Contents

Page

Foreword .....	iv
Introduction.....	v
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	2
4 Test room and size of noise source under test.....	6
5 Instrumentation and measurement equipment .....	7
6 Definition, location, installation, and operation of noise source under test.....	8
7 Measurement procedure.....	10
8 Determination of sound power levels and sound energy levels .....	12
9 Measurement uncertainty .....	16
10 Information to be recorded.....	19
11 Test report.....	21
Annex A (normative) Sound power level and sound energy level under reference meteorological conditions.....	22
Annex B (normative) Calculation of A-weighted sound power levels and A-weighted sound energy levels from octave band levels.....	24
Annex C (informative) Guidelines on the development of information on measurement uncertainty ....	26
Bibliography.....	35

## 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 3743-1 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

This second edition cancels and replaces the first edition (ISO 3743-1:1994), which has been technically revised.

ISO 3743 consists of the following parts, under the general title *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for small movable sources in reverberant fields*:

- *Part 1: Comparison method for a hard-walled test room*
- *Part 2: Methods for special reverberation test rooms*

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## Introduction

This part of ISO 3743 is an element of the series ISO 3740<sup>[1]</sup> to ISO 3747<sup>[7]</sup>, which specify various methods for determining the sound power levels and sound energy levels of noise sources including machinery, equipment and their sub-assemblies. The selection of one of the methods from the series for use in a particular application depends on the purpose of the test to determine the sound power level or sound energy level and on the facilities available. General guidelines to assist in the selection are provided in ISO 3740<sup>[1]</sup>. ISO 3740<sup>[1]</sup> to ISO 3747<sup>[7]</sup> give only general principles regarding the operating and mounting conditions of the machinery or equipment for the purposes of the test. It is important that test codes be established for individual kinds of noise source, in order to give detailed requirements for mounting, loading, and operating conditions under which the sound power levels or sound energy levels are to be obtained.

The method given in this part of ISO 3743 is based on a comparison of the sound pressure levels in octave frequency bands of a noise source under test with those of a calibrated reference sound source; A-weighted sound power levels or sound energy levels may be calculated from the octave-band levels. The method is applied in a hard-walled test room with prescribed acoustical characteristics, where it can be used for small items of portable equipment. Such a room allows either the sound power levels or the sound energy levels of the noise source under test to be determined, depending on the character of the noise emitted by the source. However, this kind of test room is not suitable for larger pieces of stationary equipment which, due to their manner of operation or installation, cannot readily be moved. The application of the method for use where the equipment or machinery is found *in situ* is described in ISO 3747<sup>[7]</sup>.

The methods specified in this part of ISO 3743 permit the determination of the sound power level and the sound energy level in frequency bands and/or with frequency A-weighting applied.

This part of ISO 3743 describes a method of accuracy grade 2 (engineering grade) as defined in ISO 12001. For applications where greater accuracy is required, reference can be made to ISO 3741<sup>[2]</sup> or an appropriate part of ISO 9614<sup>[15][17]</sup>. If the relevant criteria for the measurement environment specified in this part of ISO 3743 are not met, it might be possible to refer to another standard from this series, or to an appropriate part of ISO 9614<sup>[15][17]</sup>.