NSAI Standards

Irish Standard
I.S. EN ISO 11691:2009

# Acoustics - Measurement of insertion loss of ducted silencers without flow - Laboratory survey method (ISO 11691:1995)

# I.S. EN ISO 11691:2009

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**I.S. EN ISO 11691:2009**

EUROPEAN STANDARD

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# EN ISO 11691

August 2009

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Supersedes EN ISO 11691:1995

English Version

## Acoustics - Measurement of insertion loss of ducted silencers without flow - Laboratory survey method (ISO 11691:1995)

Acoustique - Détermination de la perte d'insertion de silencieux en conduit sans écoulement - Méthode de mesurage en laboratoire (ISO 11691:1995)

Akustik - Messung des Einfügungsdämpfungsmaßes von Schalldämpfern in Kanälen ohne Strömung - Laborverfahren der Genauigkeitsklasse 3 (ISO 11691:1995)

This European Standard was approved by CEN on 3 August 2009.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: Avenue Marnix 17, B-1000 Brussels**



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# Contents

Page

# Foreword

The text of ISO 11691:1995 has been prepared by Technical Committee ISO/TC 43 “Acoustics” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 11691:2009 by Technical Committee CEN/TC 211 “Acoustics” the secretariat of which is held by DS.

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of an identical text or by endorsement, at the latest by January 2010, and conflicting national standards shall be withdrawn at the latest by January 2010.

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 11691:1995.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directives.

For relationship with EC Directives, see informative Annexes ZA and ZB, which are integral parts of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**Endorsement notice**

The text of ISO 11691:1995 has been approved by CEN as a EN ISO 11691:2009 without any modification.

# Annex ZA
(informative)

## Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 98/37/EC, amended by 98/79/EC on machinery.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

**WARNING -** Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

# Annex ZB
(informative)

# Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

**WARNING —** Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

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I.S. EN ISO 11691:2009

INTERNATIONAL STANDARD

# ISO 11691

First edition
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1995-12-01

# Acoustics — Measurement of insertion loss of ducted silencers without flow — Laboratory survey method

*Acoustique — Détermination de la perte d'insertion de silencieux en conduit sans écoulement — Méthode de mesurage en laboratoire*

Reference number
ISO 11691:1995(E)

# 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.

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.

International Standard ISO 11691 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

Annex A of this International Standard is for information only.



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# Introduction

The insertion loss of absorbent silencers is generally not affected by the air flow, provided that the flow velocity does not exceed approximately 20 m/s in the narrowest cross-section of the silencer. In practice, non-uniform flow distributions must be considered, therefore the limit velocity of 20 m/s corresponds to a design velocity of 10 m/s to 15 m/s.

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# Acoustics — Measurement of insertion loss of ducted silencers without flow — Laboratory survey method

## 1 Scope

### 1.1 General

This International Standard specifies a laboratory substitution method to determine the insertion loss without flow of ducted, mainly absorbent, circular and rectangular silencers, as well as other duct elements for use in ventilating and air-conditioning systems.

NOTE 1 Laboratory measurement procedures for ducted silencers with superimposed flow are described in ISO 7235.

This International Standard is applicable to silencers where the design velocity does not exceed 15 m/s. As the method does not include self-generated flow noise, this International Standard is not suitable for tests on silencers where this type of noise is of great importance for the evaluation of the silencer performance.

The insertion loss determined according to this International Standard in a laboratory will not necessarily be the same as the insertion loss that will be obtained in an installation in the field. Different sound and flow fields in the duct will yield different results. As this International Standard requires regular test ducts, the results may include some flanking transmission via structural vibrations in the duct walls, that sets an upper limit to the insertion loss that can be determined.

NOTE 2 ISO 7235 gives methods for determining this limit.

This International Standard is intended to be used for circular silencers with diameters of 80 mm to 2 000 mm or rectangular silencers with cross-sectional areas within the same range.

### 1.2 Measurement uncertainty

Exact information on the precision of the method cannot be given at this time. Therefore this International Standard is denoted a survey standard.

Interlaboratory tests are necessary for the determination of the standard deviation of reproducibility, $\sigma_R$, of the method (relevant terms and methods are given in ISO 5725-1). It is, however, estimated that this method will have a $\sigma_R$ which is comparable to that of ISO 7235. See table 1.

**Table 1 — Estimated values of the standard deviation of reproducibility**

| Midband frequencies of one-third-octave band<br>Hz | Standard deviation of reproducibility, $\sigma_R$<br>dB |
|---|---|
| 50 to 1 250 | 2 |
| 1 600 to 10 000 | 3 |

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3741:1988, *Acoustics — Determination of sound power levels of noise sources — Precision methods for broad-band sources in reverberation rooms.*