

**Akustika. Mehhanismide ja seadmete
tekitatava müra väärtuste deklareerimine ja
kontrollimine**

Acoustics - Declaration and verification of noise
emission values of machinery and equipment

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 4871:1999 sisaldab Euroopa standardi EN ISO 4871:1996 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 23.11.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 4871:1999 consists of the English text of the European standard EN ISO 4871:1996.</p> <p>This document is endorsed on 23.11.1999 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
--	---

<p>Käsitlusala: See standard: - annab infot tekitatud müra väärtuste deklareerimiseks, - kirjeldab akustilist ja tooteinfot, mis tuleb esitada tehnilistes dokumentides müraemissiooni deklareerimiseks, - ja määrab kindlaks meetodi deklareeritud müranäitajate kontrollimiseks.</p>	<p>Scope:</p>
---	----------------------

ICS 17.140.20

Võtmesõnad: akustika, mehhanismid, märgistamine, müra (heli)

ICS 17.140.20

Descriptors: Noise measurement, noise emission values, machinery.

English version

Acoustics

**Declaration and verification of noise emission values
for machinery and equipment
(ISO 4871:1996)**

Acoustique – Déclaration et vérification
des valeurs d'émission sonore des
machines et équipements (ISO 4871:1996)

Akustik – Angabe und Nachprüfung von
Geräuschemissionswerten von Maschinen
und Geräten (ISO 4871:1996)

This European Standard was approved by CEN on 1996-09-27 and is identical to the ISO Standard as referred to.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

International Standard

ISO 4871 : 1996 Acoustics – Declaration and verification of noise emission values for machinery and equipment, which was prepared by ISO/TC 43 'Acoustics' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 211 'Acoustics', the Secretariat of which is held by DS, as a European Standard.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of the relevant EU Directive.

For relationship with this directive, see Annex ZA.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by June 1997 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 4871 : 1996 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZB (normative).

Introduction

Information on the acoustic noise emitted by machinery and equipment is needed by users, planners, manufacturers and authorities. This information is required for comparing the noise emitted by different products, for assessing noise emissions against noise limits, for planning workplace noise levels, as well as for checking noise reduction achievements, and may be used for estimating requirements for workplace noise immission.

In order for machinery noise emission data to be useful, uniform methods of measurement and declaration are necessary to achieve the following purposes.

a) **Measurement of noise emission**

The ISO 3740 series specifies methods for determining the sound power levels of noise sources from sound pressure level measurements; the ISO 9614 series specifies methods for determining the sound power levels from sound intensity level measurements; the ISO 11200 series describes methods for determining emission sound pressure levels at specified positions in the vicinity of machinery and equipment. Many other standards give test codes for the measurement of the noise emissions of individual types of machinery which are based on these methods.

b) **Determination of the noise emission value to be declared**

The ISO 7574 series gives methods for determining declared noise emission values which are based primarily on the sound power levels of noise sources. For a complete presentation of declared noise emission values, it is necessary to state the sound pressure levels at specified positions as well as the sound power level. Because of the possible confusion in terminology with respect to sound pressure levels used to define noise immission, the term "emission sound pressure level" is used in this International Standard.

c) **Presentation of declared noise emission values**

It is of prime importance to declare sound power levels. It is recognized, however, that information on emission sound pressure levels is sometimes required. It is recommended, therefore, that both kinds of quantity be declared, unless otherwise specified. Noise emission declarations can take the form of either a single-number or dual-number presentation; the choice is made in the noise test code appropriate to the particular family.

d) **Verification of declared noise emission values**

The ISO 7574 series gives procedures for the verification of a declared noise emission value. In that International Standard, the procedures are applied to verification of declared sound power levels. The procedures of this International Standard are applied to the verification of

both sound power levels and emission sound pressure levels. The information in this International Standard on the verification of declared noise emission values may be used both by a buyer of equipment to compare the relative noise levels of various products, and by a manufacturer as part of a statistical quality control programme.

Requirements on the declaration of noise emission values are given in clause 4.

As the declaration of noise emission of machinery and equipment is the responsibility solely of the manufacturer or supplier, guidelines concerning the declaration are found in annex A.

Requirements on the presentation of declared noise emission values are given in clause 5 and annex B, and those on verification are given in clause 6 and annex C.

1 Scope

Guidelines for determining declared noise emission values are given in annex A.

This International Standard

- gives information on the declaration of noise emission values,
- describes acoustical and product information to be presented in technical documents for the purposes of noise emission declaration, and
- specifies a method for verifying the noise emission declaration.

It is applicable to machinery and equipment.

The values to be used for the purposes of noise emission declaration are either declared single-number noise emission values, L_d , or declared dual-number noise emission values, L and K . L is a noise emission value determined directly from measurements and K is the uncertainty associated with those measurements. L_d is the sum of L and K and represents an upper limit which values from repeated measurements are unlikely to exceed at a given confidence level; L_d corresponds to the stated or labelled value, L_c , defined in ISO 7574-1.

The two forms of noise declaration are alternative means of representing any or all of the A-weighted sound power level, L_{WA} , the A-weighted emission sound pressure level at specified positions, L_{pA} , and the C-weighted peak emission sound pressure level at specified positions, $L_{pC,peak}$. The choice as to which of the two forms is used in a particular case depends upon the requirements to be fulfilled. This selection is made, and guidance on the values of K is given, in the appropriate noise test code.

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 3740:1980, *Acoustics — Determination of sound power levels of noise sources — Guidelines for the use of basic standards and for the preparation of noise test codes*.

ISO 3741:—¹⁾, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Precision methods for reverberation rooms*.

ISO 3743-1:1994, *Acoustics — Determination of sound power levels of noise sources — Engineering methods for small, movable sources in reverberant fields — Part 1: Comparison method for hard-walled test rooms*.

ISO 3743-2:1994, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering methods for small, movable sources in reverberant fields — Part 2: Methods for special reverberation test rooms*.

1) To be published. (Revision of ISO 3741:1988 and ISO 3742:1988)

ISO 3744:1994, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane.*

ISO 3745:1977, *Acoustics — Determination of sound power levels of noise sources — Precision methods for anechoic and semi-anechoic rooms.*

ISO 3746:1995, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane.*

ISO 3747:1987, *Acoustics — Determination of sound power levels of noise sources — Survey method using a reference sound source.*

ISO 7574-1:1985, *Acoustics — Statistical methods for determining and verifying stated noise emission values of machinery and equipment — Part 1: General considerations and definitions.*

ISO 7574-2:1985, *Acoustics — Statistical methods for determining and verifying stated noise emission values of machinery and equipment — Part 2: Methods for stated values for individual machines.*

ISO 7574-4:1985, *Acoustics — Statistical methods for determining and verifying stated noise emission values of machinery and equipment — Part 4: Methods for stated values for batches of machines.*

ISO 9614-1:1993, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 1: Measurement at discrete points.*

ISO 9614-2:1996, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 2: Measurement by scanning.*

ISO 11200:1995, *Acoustics — Noise emitted by machinery and equipment — Guidelines for the use of basic standards for the determination of emission sound pressure levels at a work station and at other specified positions.*

ISO 11201:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane.*

ISO 11202:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Survey method in situ.*

ISO 11203:1995, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions from the sound power level.*

ISO 11204:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Method requiring environmental corrections.*

IEC 651:1979, *Sound level meters, and Amendment 1:1993.*

IEC 804:1985, *Integrating-averaging sound level meters, and Amendment 1:1989 and Amendment 2:1993.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 machinery and equipment: An assembly of linked parts or components with the appropriate actuators, control and power circuits, etc., joined together for a specific application. Also included in this definition is an assembly of machines which, in order to achieve the same end, are arranged and controlled so that they function as a whole.

3.2 family of machinery or equipment: Machinery or equipment of similar design or type, intended to perform the same functions.

3.3 batch (lot) of equipment: A number of units of machinery or equipment of the same family produced in quantity, manufactured to the same technical specifications and characterized by the same declared noise emission values.

NOTE 1 The batch may be either an entire production series or a portion thereof.

3.4 operating mode: A condition in which the machinery or equipment is performing its intended function for the purpose of determining its noise emission values.

3.5 emission: Airborne sound radiated by a well-defined noise source (e.g. the machine under test) under specified operating and mounting conditions.

NOTE 2 Emission values may be incorporated in a product label and/or product specification. The basic noise emission quantities are the sound power level of the source itself and the emission sound pressure levels at a work