

# INTERNATIONAL STANDARD

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AMENDMENT 1  
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## Acoustics — Measurement of airborne noise emitted by information technology and telecommunications equipment

AMENDMENT 1: Noise measurement  
specification for CD/DVD-ROM drives

Acoustique — Mesurage du bruit aérien émis par les équipements liés  
aux technologies de l'information et aux télécommunications

AMENDMENT 1: Spécifications relatives au mesurage du bruit pour  
les lecteurs de CD/DVD-ROM

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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.

Amendment 1 to ISO 7779:1999 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.



## Acoustics — Measurement of airborne noise emitted by information technology and telecommunications equipment

### AMENDMENT 1: Noise measurement specification for CD/DVD-ROM drives

#### *Page 2: Normative references*

Correct the title of ISO 11201:1995 as follows:

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*

#### *Page 10: 6.6.1*

In the 2nd paragraph, replace “ISO 3741:1999, Clause 8” by “Annex A of ISO 3741:1999”.

In the 3rd paragraph, between the parentheses, replace “Clause 8 of ISO 3741:1999” by “Annex A of ISO 3741:1999”.

#### *Page 23: 9.1.3 h)*

Replace “7.7.8” by “7.8”.

#### *Page 24: 9.2*

In Note 1, replace “1 B = 10” by “1 B = 10 dB”.

#### *Page 30: C.1*

Add the following as the next line after C.18:

C.19 CD-ROM and DVD-ROM drives

#### *Page 42: C.9.1*

Add the following Note:

NOTE For CD-ROM and DVD-ROM drives, see C.19.

Page 42, C.9.2

In the second sentence, replace “shall be tested” by “shall be installed”.

Page 49: Figure C.4

At the lower end of arrow which indicates 0,25 m distance, add a symbol for another microphone as for the other four microphone positions.

Page 53: C.18.5

Correct the title as follows:

### **C.18.5 Calculation of the system A-weighted sound power level and system A-weighted sound pressure level from sub-assembly sound levels**

In the explanation of symbols after the equation, replace “ $L_{PWA,sys}$ ” by “ $L_{WA,sys}$ ”.

Page 54: after C.18.6

Add the following new clauses:

## **C.19 Equipment category: CD-ROM and DVD-ROM drives**

### **C.19.1 Description**

This category covers equipment for reading electronic information from a rotating read-only optical disc (for example, CD-ROM or DVD-ROM) or other optical media operated in a substantially sequential access manner.

### **C.19.2 Installation**

#### **C.19.2.1 General**

Installation shall be according to 5.1 and 8.5. A drive that forms part of a personal computer or rack-mounted equipment shall be installed according to C.15 or C.18 as appropriate. A drive that is tested as a sub-assembly shall be installed as a sub-assembly according to 5.1.7.

#### **C.19.2.2 Media**

The unbalance  $U_d$  of test media, defined in the following equation, shall be  $2,5 \text{ g}\cdot\text{mm} \pm 10 \%$ :

$$U_d = m_d \cdot r$$

where

$m_d$  is the mass of the disc, in grams (g);

$r$  is the distance between the centre of gravity and the geometrical centre of the disc, in millimetres (mm).

NOTE 1 More detailed and specific information on the disc media is available from reference [8].

It is recommended to use a dedicated test media which has the unbalance specified above, since

- the measurement of unbalance is not an objective of this International Standard,
- test media satisfying this requirement are commercially available from several sources<sup>1)</sup>, and
- it is not possible for most users of this International Standard to adjust media to meet the criteria for unbalance, since they can only measure the value.

NOTE 2 This media unbalance requirement is based on several considerations as follows.

Clause C.1 requires that the operation be “typical of average end use”. Conditions are to be “specified with a view to facilitate the operation of the equipment and to enhance the reliability of the acoustical measurements”. The disc unbalance of  $2,5 \text{ g}\cdot\text{mm} \pm 10\%$  is specified as “typical of average end use” and is also consistent with reliable acoustical measurements, since this degree of unbalance avoids causing some drives to slow down. Technical details justifying this are contained in reference [9].

### C.19.3 Operation

#### C.19.3.1 Idle mode

Except for short-duration transients, idle modes are considered non-rotational and inaudible. Therefore measurement of the idle mode is not required.

In cases where the drive under test incorporates cooling assemblies for its normal operation, the cooling noise shall be measured as a part of noise of the drive.

#### C.19.3.2 Operating mode

**C.19.3.2.1** For units having a single drive, the drive shall be operating as specified in C.19.3.2.3.

**C.19.3.2.2** For units with multiple drives, the number of drives that are simultaneously operable by the host CPU shall be operated as specified in C.19.3.2.3. All other drives shall be in the idle mode, typical of normal use for the system.

**C.19.3.2.3** Start the sequential read at the inner radius of the disc (or media) such that the disc spins continuously at the fastest speed sustainable with the specified media. Repeat this process until the measurement duration specified in C.19.4 has elapsed.

### C.19.4 Measurement duration

The time-average sound pressure level shall be measured for at least the duration specified in 6.7.2 or 7.7.2.

1) For instance, Almedio, 2-32-13 Sakae-cho, Higashimurayama, Tokyo, Japan, offers such discs (<http://www.almedio.co.jp>).

This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of this product.

Page 57: Annex D

Correct the equation in the 7th line of D.6 as follows:

$$f_0 = \sqrt{f_1 \times f_2}$$

Page 61: Bibliography

Add the following references:

- [8] *Recordable Compact Disc Systems, Part III: CD-RW, Version 2.0. System Description*, August, 1998, SONY/PHILIPS
- [9] KIMIZUKA I. Development of ISO 7779 Amendment 1, "Noise measurement specification for CD/DVD-ROM drives". *Proc. INTER-NOISE 02, N575, Dearborn, MI*, 2002