

**Acoustics - Noise from shooting ranges -  
Part 1: Determination of muzzle blast by  
measurement**

Acoustics - Noise from shooting ranges - Part 1:  
Determination of muzzle blast by measurement

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 17201-1:2005 sisaldab Euroopa standardi EN ISO 17201-1:2005 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 25.10.2005 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 17201-1:2005 consists of the English text of the European standard EN ISO 17201-1:2005.</p> <p>This document is endorsed on 25.10.2005 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>
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<p><b>Käsitlusala:</b></p> <p>This part of ISO 17201 specifies a method to determine the acoustic source energy of the muzzle blast for calibres of less than 20 mm or explosive charges of less than 50 g TNT equivalent.</p>	<p><b>Scope:</b></p> <p>This part of ISO 17201 specifies a method to determine the acoustic source energy of the muzzle blast for calibres of less than 20 mm or explosive charges of less than 50 g TNT equivalent.</p>
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English Version

**Acoustics - Noise from shooting ranges - Part 1: Determination  
of muzzle blast by measurement (ISO 17201-1:2005)**

Acoustique - Bruit des stands de tir - Partie 1: Mesurage de  
l'énergie sonore en sortie de bouche (ISO 17201-1:2005)

Akustik - Geräusche von Schießplätzen - Teil 1:  
Bestimmung des Mündungsknalls durch Messung (ISO  
17201-1:2005)

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## Foreword

This document (EN ISO 17201-1:2005) has been prepared by Technical Committee ISO/TC 43 "Acoustics" in collaboration with 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of an identical text or by endorsement, at the latest by February 2006, and conflicting national standards shall be withdrawn at the latest by February 2006.

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## Endorsement notice

The text of ISO 17201-1:2005 has been approved by CEN as EN ISO 17201-1:2005 without any modifications.

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**Acoustics — Noise from shooting  
ranges —**

**Part 1:  
Determination of muzzle blast by  
measurement**

*Acoustique — Bruit des stands de tir —*

*Partie 1: Mesurage de l'énergie sonore en sortie de bouche*



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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 17201-1 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

ISO 17201 consists of the following parts, under the general title *Acoustics — Noise from shooting ranges*:

- *Part 1: Determination of muzzle blast by measurement*
- *Part 2: Estimation of muzzle blast and projectile sound by calculation*
- *Part 4: Prediction of projectile sound*

The following parts are under preparation:

- *Part 3: Guidelines for sound propagation calculation*
- *Part 5: Noise management*

The initiative to prepare a standard on impulse noise from shooting ranges was taken by AFEMS, the Association of European Manufacturers of Sporting Ammunition, in April 1996, by the submission of a formal proposal to CEN. After consultation in CEN in 1998, CEN/TC 211, *Acoustics*, asked ISO/TC 43/SC 1, *Noise*, to prepare the ISO 17201 series.



## Introduction

To obtain reliable data for the prediction of shooting sound levels at a reception point, the energy of sound emission produced by the muzzle blast is needed. The muzzle blast is produced by the propellant gas expelled from the barrel of a weapon; in most cases the gas has a supersonic fluid speed. Close to the muzzle, the sound pressure is very high and cannot be described with linear acoustics. For the purposes of this part of ISO 17201, the non-linear region is defined by the observation of a peak sound pressure level of 154 dB or more. This part of ISO 17201 defines how the sound source energy and directivity of the muzzle blast can be obtained from the measurement of sound exposure levels and how these measurements are to be carried out. The source energy, its directivity and spectral structure may be used as input for sound propagation models for environmental noise assessment. This cannot be used for calculations of sound exposure levels close to the weapon, for instance to estimate injury to people or animals.



# Acoustics — Noise from shooting ranges —

## Part 1: Determination of muzzle blast by measurement

### 1 Scope

This part of ISO 17201 specifies a method to determine the acoustic source energy of the muzzle blast for calibres of less than 20 mm or explosive charges of less than 50 g TNT equivalent. It is applicable at distances where peak pressures less than 1 kPa (equivalent to a peak sound pressure level of 154 dB) are observed. The source energy, directivity of the source and their spectral structure determined by this procedure can be used as input data to sound propagation programmes, enabling prediction of shooting noise in the neighbourhood of shooting ranges. Additionally, the data can be used to compare sound emission from different types of guns or different types of ammunition used with the same gun.

This part of ISO 17201 is applicable to guns used in civil shooting ranges but it can also be applied to military guns. It is not applicable to the assessment of hearing damage or sound levels in the non-linear region.

### 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 9613-1, *Acoustics — Attenuation of sound during propagation outdoors — Part 1: Calculation of the absorption of sound by the atmosphere*

IEC 60942:2003, *Electroacoustics — Sound calibrators*

IEC 61672-1:2002, *Electroacoustics — Sound level meters — Part 1: Specifications* <sup>1)</sup>

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1

##### instantaneous sound pressure

$p$

total instantaneous pressure at a point, in the presence of a sound wave, minus the atmospheric pressure at that point

NOTE The instantaneous sound pressure is expressed in pascals.

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1) Amalgamated revision of IEC 60651 and IEC 60804.