

SLOVENSKI STANDARD
SIST EN ISO 17201-1:2019**01-marec-2019****Nadomešča:****SIST EN ISO 17201-1:2005****SIST EN ISO 17201-1:2005/AC:2009**

Akustika - Hrup s strelišč - 1. del: Določanje poka potisnih plinov iz ustja strelnih orožij z merjenjem (ISO 17201-1:2018)

Acoustics - Noise from shooting ranges - Part 1: Determination of muzzle blast by measurement (ISO 17201-1:2018)

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Akustik - Geräusche von Schießplätzen - Teil 1: Bestimmung des Mündungsknalls durch Messung (ISO 17201-1:2018) (standards.itteh.ai)

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Acoustique - Bruit des stands de tir - Partie 1: Mesurage de l'énergie sonore en sortie de bouche (ISO 17201-1:2018)

Ta slovenski standard je istoveten z: EN ISO 17201-1:2018**ICS:**

17.140.20	Emisija hrupa naprav in opreme	Noise emitted by machines and equipment
95.020	Vojaštvo na splošno	Military in general
97.220.10	Športni objekti	Sports facilities

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Acoustics - Noise from shooting ranges - Part 1: Determination of muzzle blast by measurement (ISO 17201-1:2018)

Acoustique - Bruit des stands de tir - Partie 1:
Mesurage de l'énergie sonore en sortie de bouche (ISO
17201-1:2018)

Akustik - Geräusche von Schießplätzen - Teil 1:
Bestimmung des Mündungsknalls durch Messung (ISO
17201-1:2018)

This European Standard was approved by CEN on 12 November 2018.

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European foreword

This document (EN ISO 17201-1:2018) 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 DIN.

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of an identical text or by endorsement, at the latest by June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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INTERNATIONAL
STANDARD

ISO
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Second edition
2018-11

**Acoustics — Noise from shooting
ranges —**

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

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Acoustique — Bruit des stands de tir —
(standards.iteh.ai) 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html. (standards.iteh.ai)

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

This second edition cancels and replaces the first edition (ISO 17201-1:2005), which has been technically revised. It also incorporates the Technical Corrigendum ISO 17201-1:2005/Cor 1:2009.

The main changes compared to the previous edition are as follows:

- the complete document has been editorially revised;
- [5.1](#), especially [Figure 3](#) and the attached formula have been technically revised;
- [Annex A](#) (informative) "Small arms glossary" has been revised editorially;
- [Annex B](#) (informative) has been technically revised;
- references have been updated.

A list of all parts in the ISO 17201 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

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.

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 purpose of this document, the non-linear region is defined by the observation of a peak sound pressure level of 154 dB or more. This document 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 can 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.

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Acoustics — Noise from shooting ranges —

Part 1:

Determination of muzzle blast by measurement

1 Scope

This document 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 the 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 document 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.

Suppressors and silencers are not taken into consideration in this document.

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2 Normative references (standards.iteh.ai)

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60942, *Electroacoustics — Sound calibrators*

IEC 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications*

ISO/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 sound pressure

p

difference between instantaneous total pressure and static pressure

Note 1 to entry: The sound pressure is expressed in pascals (Pa).

Note 2 to entry: Static pressure is the pressure that exists in the absence of sound waves.

Note 3 to entry: This definition applies to a medium allowing a non-zero mean flow in the atmosphere.

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Note 4 to entry: This definition is technically in accordance with ISO 80000-8:—¹⁾, item 8-2.2.

Note 5 to entry: For the definition of "static pressure" see ISO 80000-8:—, item 8-2.1, with the difference of allowing non-zero mean flow.

3.2 sound pressure level

L_p
ten times the logarithm to the base 10 of the ratio of the square of the root-mean-squared sound pressure, p_{rms} , to the square of a reference value, p_0

$$L_p = 10 \lg \frac{p_{\text{rms}}^2}{p_0^2} \text{ dB} \quad (1)$$

Note 1 to entry: The sound pressure level is expressed in decibels (dB).

Note 2 to entry: The sound pressure is expressed in pascals (Pa).

Note 3 to entry: For sound in air and other gases, the reference sound pressure is given by $p_0 = 20 \mu\text{Pa}$.

Note 4 to entry: The sound pressure level can be frequency weighted and time weighted.

Note 5 to entry: This definition is technically in accordance with ISO 80000-8:—, item 8-15.

[SOURCE: ISO/TR 25417:2007, 2.2, modified — “the sound pressure, p ” has been replaced with “the root-mean-squared sound pressure, p_{rms} ”; the wording “where the reference value, p_0 , is $20 \mu\text{Pa}$ ” has been removed; the original NOTE 1 and 2 have been removed; Note 1, 2, 3, 4 and 5 to entry have been added.]

3.3 peak sound pressure

p_{peak}
maximum absolute *sound pressure* (3.1) during a stated time interval

Note 1 to entry: The peak sound pressure is expressed in pascals (Pa).

[SOURCE: ISO/TR 25417:2007, 2.4, modified — The word “greatest” has been replaced with “maximum”; the word “certain” has been replaced with “stated”; NOTE 2 has been removed.]

3.4 peak sound pressure level

$L_{p,\text{peak}}$
ten times the logarithm to the base of 10 of the ratio of the square of the *peak sound pressure*, p_{peak} (3.3) to the square of the reference value, p_0

$$L_{p,\text{peak}} = 10 \lg \frac{p_{\text{peak}}^2}{p_0^2} \text{ dB} \quad (2)$$

Note 1 to entry: The reference value is given by $p_0 = 20 \mu\text{Pa}$.

Note 2 to entry: The peak sound pressure level is expressed in decibels (dB).

Note 3 to entry: Peak sound pressure should be determined with a detector as defined in IEC 61672-1; IEC 61672-2 only specifies the accuracy of a detector using C-weighting.

[SOURCE: ISO/TR 25417:2007, 2.5, modified — The wording “where the reference value, p_0 , is $20 \mu\text{Pa}$ ” has been removed; the original NOTE has been removed; Note 1, 2 and 3 to entry have been added.]

1) Under preparation.

3.5 event duration

T

stated time interval, long enough to encompass all significant sound of a stated event

Note 1 to entry: The event duration is expressed in seconds (s).

3.6 sound exposure

E_T

integral of the square of the *sound pressure*, p (3.1), over a stated time interval or *event duration*, T (3.5), starting at t_1 and ending at t_2

$$E_T = \int_{t_1}^{t_2} p^2(t) dt \quad (3)$$

Note 1 to entry: The sound exposure is expressed in pascal-squared seconds (Pa²s).

[SOURCE: ISO/TR 25417:2007, 2.6, modified — The original NOTE 1 to 4 have been removed; Note 1 to entry has been added.]

3.7 sound exposure level

$L_{E,T}$

ten times the logarithm to the base 10 of the ratio of the sound exposure, E_T (3.6), to a reference value, E_0

$$L_{E,T} = 10 \lg \frac{E_T}{E_0} \text{ dB} \quad (4)$$

Note 1 to entry: The sound exposure level is expressed in decibels (dB).

Note 2 to entry: For sound in air and other gases, the reference value is given by $E_0 = 400 \mu\text{Pa}^2\text{s}$.

Note 3 to entry: This definition is technically in accordance with ISO 80000-8:—, item 8-17.

[SOURCE: ISO/TR 25417:2007, 2.7, modified — The original NOTE 1 to 3 have been removed; Note 1, 2 and 3 to entry have been added.]

3.8 source energy

Q

total sound source energy of the event

Note 1 to entry: The source energy is expressed in joules (J).

3.9 source energy level

L_Q

ten times the logarithm to the base 10 of the ratio of *source energy*, Q (3.8), to the reference source energy, Q_0

$$L_Q = 10 \lg \left(\frac{Q}{Q_0} \right) \text{ dB} \quad (5)$$

Note 1 to entry: The source energy level is expressed in decibels (dB).

Note 2 to entry: The reference value is given by $Q_0 = 10^{-12}$ J.