

SLOVENSKI STANDARD
oSIST prEN ISO 17201-1:2017
01-oktober-2017

Akustika - Hrup strelskih poligonov - 1. del: Določanje poka strelnih orožij z merjenjem (ISO/DIS 17201-1:2017)

Acoustics - Noise from shooting ranges - Part 1: Determination of muzzle blast by measurement (ISO/DIS 17201-1:2017)

Akustik - Geräusche von Schießplätzen - Teil 1: Bestimmung des Mündungsknalls durch Messung (ISO/DIS 17201-1:2017)

Acoustique - Bruit des stands de tir - Partie 1: Détermination de l'énergie sonore en sortie de bouche (ISO/DIS 17201-1:2017)

Ta slovenski standard je istoveten z: prEN ISO 17201-1

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

oSIST prEN ISO 17201-1:2017

en

DRAFT INTERNATIONAL STANDARD

ISO/DIS 17201-1

ISO/TC 43/SC 1

Secretariat: DIN

Voting begins on:
2017-08-16Voting terminates on:
2017-11-07

Acoustics — Noise from shooting ranges —

Part 1: Determination of muzzle blast by measurement

*Acoustique — Bruit des stands de tir —**Partie 1: Détermination de l'énergie sonore en sortie de bouche*

ICS: 95.020; 17.140.20; 97.220.10

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

SIST EN ISO 17201-1:2019<https://standards.iteh.ai/catalog/standards/sist/d9c5bc95-4c8a-4c89-9240-b6c2f6deccda0/sist-en-iso-17201-1-2019>

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING



Reference number
ISO/DIS 17201-1:2017(E)

© ISO 2017

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

SIST EN ISO 17201-1:2019

<https://standards.iteh.ai/catalog/standards/sist/d9c5bc95-4c8a-4c89-9240-b6c2f6deccda0/sist-en-iso-17201-1-2019>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword.....	iv
Introduction.....	v
1 Scope	1
2 Normative references	1
3 Terms and definitions.....	1
4 Gun and ammunition.....	5
4.1 General	5
4.2 Gun	5
4.3 Ammunition.....	6
4.4 Ballistic Parameters	7
4.5 Test situation	8
4.6 Other features	8
5 Basic concept for measurement and analysis	8
5.1 General	8
5.2 Quantity to be measured.....	10
5.3 Angular source energy distribution level.....	10
5.4 Interpolated angular source energy distribution level.....	11
5.5 Source energy level.....	11
5.6 Directivity.....	11
6 Measurement site	11
6.1 Site.....	11
6.2 Weather conditions.....	12
7 Measurement planning.....	12
7.1 General remarks	12
7.2 Gun	12
7.3 Measurement position.....	12
7.4 Measurement Equipment	13
7.5 Dealing with projectile sound	13
8 Calibration and Validation	14
9 Measurement procedures	14
9.1 General	14
9.2 Ground reflection correction	14
10 Control of measurement layout.....	14
11 Measurement uncertainty	15
11.1 General	15
11.2 Empirical part	15
12 Report	16
Annex A (informative) Small arms Glossary	18
Annex B (informative) Example.....	32
Annex C (informative) Guidance on the measurement uncertainty.....	40
Bibliography	43

ISO/DIS 17201-1:2017(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.

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 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.

The committee responsible for this document is 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.

The content of ISO 17201-1 Technical Corrigendum 1 has been incorporated, references were updated and Annex B (informative) has been technically revised.

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

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 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.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[SIST EN ISO 17201-1:2019](https://standards.iteh.ai/catalog/standards/sist/d9c5bc95-4c8a-4c89-9240-b6c2f6decda0/sist-en-iso-17201-1-2019)

<https://standards.iteh.ai/catalog/standards/sist/d9c5bc95-4c8a-4c89-9240-b6c2f6decda0/sist-en-iso-17201-1-2019>

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.

IEC 60942:2016, *Electroacoustics — Sound calibrators*

IEC 61672-1:2013, *Electroacoustics — Sound level meters – Part 1: Specifications*

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:

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

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 1 to entry: The instantaneous sound pressure is expressed in pascals.

ISO/DIS 17201-1:2017(E)

3.2**sound pressure level** L_p

ten times the logarithm to the base of 10 of the square of the ratio of a given root-mean-square sound pressure to the reference sound pressure

Note 1 to entry: The reference sound pressure is 20 µPa.

Note 2 to entry: The sound pressure level is expressed in decibels.

Note 3 to entry: The sound pressure level can be frequency weighted and time weighted.

3.3**peak sound pressure** p_{peak}

maximum absolute value of the instantaneous sound pressure during a stated time interval

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

3.4**peak sound pressure level** L_{peak}

ten times the logarithm to the base of 10 of the square of the ratio of the peak sound pressure to the reference sound pressure of 20 µPa

Note 1 to entry: The peak sound pressure level is expressed in decibels.

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. [17201-1:2019](https://standards.iteh.ai/catalog/standards/sist/d9c5bc95-4c8a-4c89-9240-b6c2f6deccda0/sist-en-iso-17201-1-2019)

<https://standards.iteh.ai/catalog/standards/sist/d9c5bc95-4c8a-4c89-9240-b6c2f6deccda0/sist-en-iso-17201-1-2019>

3.6**sound exposure** E

time integral of frequency-weighted squared instantaneous sound pressure

$$E = \int_T p^2(t) dt \quad (1)$$

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

3.7**sound exposure level** L_E

ten times the logarithm to the base 10 of the ratio of the sound exposure, E , to the reference sound exposure, E_0 , the sound exposure being the time integral of the time-varying square of the frequency-weighted instantaneous sound pressure over a stated time interval, T , or an event

$$L_E = 10 \lg \left[\frac{E}{E_0} \right] \text{ dB} \quad (2)$$

Note 1 to entry: E_0 is equal to the square of the reference sound pressure of 20 μPa multiplied by the time interval of 1 s ($400 \mu\text{Pa}^2 \cdot 1\text{s}$).

3.8

source energy

Q

total sound source energy of the event

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

3.9

source energy level

L_Q

ten times the logarithm to the base 10 of the ratio of source energy, Q , to the reference source energy, Q_0

$$L_Q = 10 \lg \left(\frac{Q}{Q_0} \right) \text{ dB} \quad (3)$$

where

$$Q_0 = 10^{-12} \text{ J}$$

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

3.10

angular source energy distribution

$S_q(\alpha)$

acoustic energy radiated from the source into the far field, per unit solid angle

Note 1 to entry: The acoustic energy radiated by the source within a narrow cone centred on the direction α is:

$$S_q(\alpha) = \frac{dQ}{d\Omega} \quad (4)$$

Note 2 to entry: Ω is the solid angle expressed in steradians.

Note 3 to entry: The angular source energy distribution $S_q(\alpha)$ is expressed in joules per steradians (J sr^{-1}).

Note 4 to entry: Rotational symmetry is assumed around the line with $\alpha = 0$.

3.11

interpolated angular source energy distribution

$\bar{S}_q(\alpha)$

continuous function in α of the source energy distribution $S_q(\alpha)$, derived by using a defined interpolation method

Note 1 to entry: The interpolated angular source energy distribution, $\bar{S}_q(\alpha)$, is expressed in joules per steradians (J sr^{-1}).

ISO/DIS 17201-1:2017(E)

3.12**angular source energy distribution level** $L_q(\alpha)$ angular source energy distribution as a level relative to 10^{-12} J

$$L_q(\alpha) = 10 \lg \left(\frac{S_q(\alpha)}{S_{q_0}(\alpha)} \right) \text{ dB} \quad (5)$$

where

$$S_{q_0}(\alpha) = 10^{-12} \text{ J s r}^{-1}$$

Note 1 to entry: The angular source energy distribution level, $L_q(\alpha)$, is expressed in decibels.**3.13****interpolated angular source energy distribution level** $\overline{L}_q(\alpha)$ continuous function in α of the angular source energy distribution level, $L_q(\alpha)$, derived by using a defined interpolation method

Note 1 to entry: The interpolated angular source energy distribution level is expressed in decibels.

3.14**angle alpha** α

angle between the line of fire and a line from the muzzle to the receiver (see Figure 3)

Note 1 to entry: The angle alpha is expressed in radians in all formulae.

3.15**angle beta** β

angle describing the rotation around the line of fire, anticlockwise from the view of the shooter, as the angle between the horizontal plane intersecting the muzzle from the right-hand side (see Figure 3)

Note 1 to entry: The angle beta is expressed in radians in all formulae.

3.16**angle gamma** γ

angle describing the inclination of the line of fire from the horizontal plane (see Figure 3)

Note 1 to entry: The angle gamma is expressed in radians in all formulae.

3.17**angle delta** δ angle constituted by the projection of angle α on the horizontal plane (see Figure 3)

Note 1 to entry: The angle delta is expressed in radians in all formulae.

3.18**directivity** **$D(\alpha)$**

difference between the angular source energy distribution level of the source under test and the source energy distribution level of a monopole source with the same acoustic source energy

Note 1 to entry: The directivity is expressed in decibels.

3.19**muzzle distance** **r_m**

distance measured from the muzzle to the microphone point (see Figure 3)

Note 1 to entry: The distance is expressed in metres.

4 Gun and ammunition**4.1 General**

The information given in 4.2 to 4.6 is needed to unambiguously define the weapon plus ammunition combination for which the sound exposure level of the muzzle blast is estimated (items marked by an asterisk are mandatory). All terms have the meanings given in Reference [10] and Annex A.

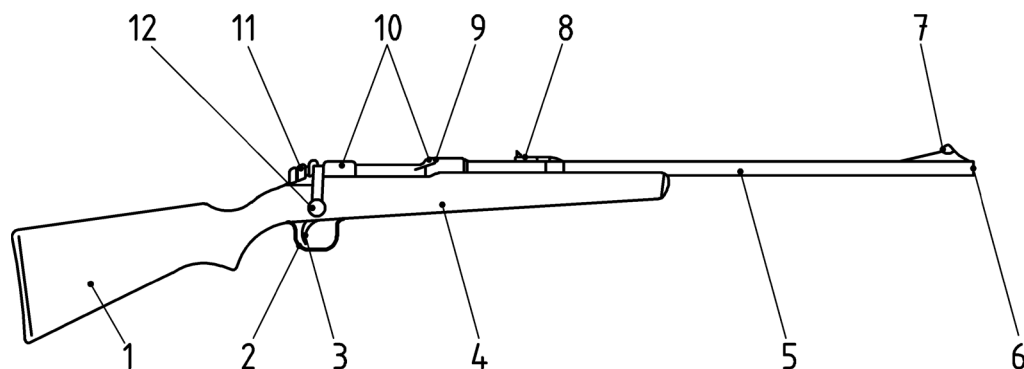
4.2 Gun

The following features shall be stated:

- *description or brand name;
- *type of gun (shot gun, rifle, revolver, pistol, etc.);
- number, type and disposition of barrels (side-to-side, superposed, drilling, etc.);
- calibre;
- *barrel bore;
- *barrel length.

Figure 1 is a schematic view and gives the main terms used to describe the gun.

ISO/DIS 17201-1:2017(E)

**Key**

1	stock	7	front sight
2	trigger guard	8	rear sight
3	trigger	9	bolt
4	magazine (inside)	10	receiver
5	barrel	11	safety lock
6	muzzle	12	bolt handle

Figure 1 — Main terms used to describe the gun (schematic view)

The main parts of smooth-bore barrel and a rifled barrel are given in Annex A.

Special features such as:

- choke,
- reload system,
- *flame shield and
- *muzzle brake

should be mentioned.

4.3 Ammunition

The following information is needed:

- *description or brand name;
- *projectile calibre;
- type and mass or chemical energy of propellant;
- type of projectile (ball, pellets or blank);
- *projectile mass.

In case of shot guns:

- total length of the cartridge;