

**Masinate ohutus. Lasertööluseseadmed. Osa 3:
Lasertööluspinkide, käeshoitavate
lasertööluseseadmete ja seonduvate abiseadmete müra
vähendamine ja müra mõõtmismeetodid (2. täpsusklass)**

**Safety of machinery - Laser processing machines - Part
3: Noise reduction and noise measurement methods for
laser processing machines and hand-held processing
devices and associated auxiliary equipment (accuracy
grade 2) (ISO 11553-3:2013)**

EESTI STANDARDI EESSÕNA

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ICS 13.110, 31.260

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English Version

Safety of machinery - Laser processing machines - Part 3: Noise reduction and noise measurement methods for laser processing machines and hand-held processing devices and associated auxiliary equipment (accuracy grade 2) (ISO 11553-3:2013)

Sécurité des machines - Machines à laser - Partie 3:
Méthodes de mesure et de réduction du bruit des machines
à laser, des dispositifs de traitement portatifs et des
équipements auxiliaires connexes (classe de précision 2)
(ISO 11553-3:2013)

Sicherheit von Maschinen - Laserbearbeitungsmaschinen -
Teil 3: Lärminderungs- und Geräuschmessverfahren für
Laserbearbeitungsmaschinen und handgeführte
Laserbearbeitungsgeräte sowie zugehörige
Hilfseinrichtungen (Genauigkeitsklasse 2) (ISO 11553-
3:2013)

This European Standard was approved by CEN on 1 March 2013.

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN ISO 11553-3:2013) has been prepared by Technical Committee ISO/TC 172 "Optics and photonics" in collaboration with Technical Committee CEN/TC 123 "Lasers and photonics" 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of an identical text or by endorsement, at the latest by September 2013, and conflicting national standards shall be withdrawn at the latest by September 2013.

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

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

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 11553-3:2013 has been approved by CEN as EN ISO 11553-3:2013 without any modification.

Annex ZA (informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the Essential Requirement on noise of that Directive and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

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Introduction

The Machinery Safety Directive issued by the Council of the EU outlines essential and mandatory requirements that must be met in order to ensure that machinery is safe. In response, CEN/CENELEC initiated a programme to produce safety standards for machines and their applications. This part of ISO/IEC 11553 is one in that series. It has been prepared as a harmonized standard to provide a means of conforming with the essential safety requirements of the Machinery Directive and associated EFTA Regulations.

This document is a type B standard as stated in ISO 12100. The provision of this document may be supplemented or modified by a type C standard.

For machines which are covered by the scope of a type C standard and which have been designed and built according to the provision of that standard, the provisions of that type C standard take precedence over the provisions of this type B standard.

It is applicable to machines using laser radiation to process materials. The purpose of this part of ISO/IEC 11553 is to prevent injuries to persons by

- listing potential hazards generated by machines containing lasers,
- specifying safety measures and verifications necessary for reducing the risk caused by specific hazardous conditions,
- providing references to pertinent standards, and
- specifying the information which is to be supplied to the users so that they can establish proper procedures and precautions.

Safety of machinery — Laser processing machines —

Part 3:

Noise reduction and noise measurement methods for laser processing machines and hand-held processing devices and associated auxiliary equipment (accuracy grade 2)

1 Scope

This part of ISO/IEC 11553 describes the requirements to deal with noise hazards and specifies all the information necessary to carry out efficiently and under standardized conditions the determination, declaration and verification of airborne noise emission from laser processing machines and hand-held laser processing devices within the scope of ISO/IEC 11553-1 and ISO/IEC 11553-2. It specifies the safety requirements relating to noise hazards. It specifies noise measurement methods, installation and operating conditions to be used for the test, together with the information to be supplied by manufacturers of such equipment.

This part of ISO/IEC 11553 applies to those laser processing machines and hand-held laser processing devices included in the scope of ISO/IEC 11553-1 and ISO/IEC 11553-2.

Noise emission characteristics include emission sound pressure levels at work stations and the sound power level. Declared noise emission values permit comparison of laser processing machines and hand-held laser processing devices on the market.

The use of this noise test code (see [Annex A](#)) ensures the reproducibility of the determination of the characteristic noise emission values within specific limits. These limits are determined by the accuracy grade of the noise emission measuring method used. Noise emission measurements specified by this part of ISO/IEC 11553 meet the requirements of an engineering method (accuracy grade 2).

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

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

ISO 4871, *Acoustics — Declaration and verification of noise emission values of machinery and equipment*

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

ISO 11201, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections*

ISO 11202, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections*

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, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections*

ISO/IEC 11553-1, *Safety of machinery — Laser processing machines — Part 1: General safety requirements*

ISO/IEC 11553-2, *Safety of machinery — Laser processing machines — Part 2: Safety requirements for hand-held laser processing devices*

ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

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

EN 352-1, *Hearing protectors — General requirements — Part 1: Ear-Muffs*

3 Noise hazards

Noise generated by laser processing machines and hand-held laser processing devices can result in, for example:

- a) permanent hearing loss;
- b) tinnitus;
- c) tiredness, stress, headaches;
- d) other effects such as loss of balance, loss of awareness;
- e) interference with speech communication;
- f) inability to hear acoustic warning signals.

4 Safety requirements and measures

4.1 General requirements for noise reduction

Noise reduction shall be an integral part of the design process by specifically taking into account the measures at source as suggested in ISO/TR 11688-1. The success of the applied noise reduction measures is assessed on the basis of the actual noise emission values according to the noise test code specified within this part of ISO/IEC 11553 in relation to other laser processing machines of a similar application.

4.2 Noise reduction measures

Appropriate noise reduction measures shall be applied.

Particular considerations can be given to:

- a) selecting low noise level pumps rather than enclosing the pumps;
- b) releasing of pneumatic energy (To conserve energy, unnecessary releases should be avoided. Silencers or exhaust filters should be considered.);
- c) stabilizing vibrating pipelines by special fastenings to reduce noise created by such movements;
- d) the laser power generation noise source by selection of low noise components such as fans or by resilient mounting or absorber;
- e) damping measures to be applied at the cooling and fume exhaust systems;