SLOVENSKI STANDARD
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Ročna prenosna električna orodja - Preskusne metode za vrednotenje oddajanja vibracij - 13. del: Orodja za pritrjevanje/zabijanje (ISO/DIS 28927-13:2019)

Hand-held portable power tools - Test methods for evaluation of vibration emission - Part 13: Fastener driving tools (ISO/DIS 28927-13:2019)

Handgehaltene motorbetriebene Maschinen - Messverfahren zur Ermittlung der Schwingungsemission - Teil 13: Eintreibgeräte (ISO/DIS 28927-13:2019)

Machines à moteur portatives - Mesurage des vibrations au niveau des poignées - Partie 13: Machines à enfoncer les fixations (ISO/DIS 28927-13:2019)

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13.160	Vpliv vibracij in udarcev na ljudi	Vibration and shock with respect to human beings
25.140.01	Ročna orodja na splošno	Hand-held tools in general

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Hand-held portable power tools — Test methods for evaluation of vibration emission —

Part 13:
Fastener driving tools

Machines à moteur portatives — Mesurage des vibrations au niveau des poignées —

Partie 13: Machines à enfoncer les fixations

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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 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 Technical Committee ISO/TC 118, *Compressors and pneumatic tools, machines and equipment*, Subcommittee SC 3, *Pneumatic tools and machines.*

This first edition of ISO 28927-13 cancels and replaces ISO 8662-11:1999 and ISO 8662-11 AMD 1:2001, of which it constitutes a technical revision. The most important changes are

— vibration measurement in three axes and at both hand positions,

— new transducer positions,

— improved definition of transducer positions and orientation.

A list of all the parts in the ISO 28927- series can be found on the ISO website.

Introduction

This document is a type-C standard as stated in ISO 12100.

When requirements of this type-C standard are different from those which are stated in type-A or -B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

The vibration test codes for portable hand-held machines given in ISO 28927 are based on ISO 20643, which gives general specifications for the measurement of the vibration emission of hand-held and hand-guided machinery. ISO 28927 specifies the operation of the machines under type-test conditions and other requirements for the performance of type tests. The structure/numbering of its clauses follows that of ISO 20643.

The basic principle for transducer positioning first introduced in the EN 60745 series of European standards is followed, representing a deviation from ISO 20643 for reasons of consistency. The transducers are primarily positioned next to the hand in the area between the thumb and the index finger, where they give the least disturbance to the operator gripping the machine.

In order to provide a method that gives good measurement reproducibility, this part of ISO 28927 adopts a procedure for testing impact and impulse machines using a test device based on break blocks acting on the outer diameter of a test socket, and a free running test for other machines. The procedures of ISO 5349 are required whenever exposure at the workplace is to be assessed.

The values obtained are type-test values intended to be representative of the average of the upper quartile of typical vibration magnitudes in real-world use of the machines. However, the actual magnitudes will vary considerably from time to time and depend on many factors, including the operator, the task and the inserted tool or consumable. The state of maintenance of the machine itself might also be of importance. Under real working conditions the influences of the operator and process can be particularly important at low magnitudes. It is therefore not recommended that emission values below 2,5 m/s2 be used for estimating the vibration magnitude under real working conditions in such cases, 2,5 m/s2 is the recommended vibration magnitude for estimating the machine vibration.

If accurate values for a specific work place are required, then measurements (according to ISO 5349) in that work situation could be necessary. Vibration values measured in real working conditions can be either higher or lower than the values obtained using this part of ISO 28927.

The vibration test codes given in ISO 28927 supersede those given in ISO 8662, whose parts have been replaced by the corresponding parts of ISO 28927 (see Foreword).

Hand-held portable power tools — Test methods for evaluation of vibration emission —

Part 13: Fastener driving tools

1 Scope

This document specifies a laboratory method for measuring the vibration at the handle of continuous operating fastener driving tools. It is a type test procedure for establishing the vibration value on the handle of a hand-held power tool operating under a specified load.

This document is applicable for fastener driving tools, driven pneumatically or by other means (see Figure 1). This document is applicable to fasteners comprising nails, staples, pins, etc.

2 Normative references

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.

ISO 5349 (all parts), *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration*

ISO 5391, *Pneumatic tools and machines — Vocabulary*

ISO 17066, *Hydraulic tools — Vocabulary*

ISO 20643, *Mechanical vibration — Hand-held and hand-guided machinery — Principles for evaluation of vibration emission*

EN 12096, *Mechanical vibration — Declaration and verification of vibration emission values*

ISO/TS 15694, *Mechanical vibration and shock — Measurement and evaluation of single shocks transmitted from hand-held and hand-guided machines to the hand-arm system*

3 Terms, definitions and symbols

For the purposes of this document, the terms and definitions given in ISO 5391, ISO 17066 and ISO 20643, and the following terms, definitions and symbols, apply.

3.1
fastener driving tool
stapler
power tool for driving nails/staples with one or more strokes

3.1.2
continuous operation
is the operating state according to ISO 11148-13:2017, 3.2.7, 3.2.8, 3.2.9 and 3.2.10

4 Symbols

Symbol	Description	Unit
a_{hw}	root-mean-square (r.m.s.) single-axis acceleration value of the frequency-weighted hand-transmitted vibration	m/s^2
a_{hv}	vibration total value of frequency-weighted r.m.s. acceleration; root sum of squares of a_{hw} values for the three measured axes of vibration	m/s^2
$\overline{a_{hv}}$	arithmetic mean value of a_{hv} values of runs for one operator for one hand position	m/s^2
$a_{hv,\,3s}$	is the time averaged weighted single event vibration value normalised to one operation each three seconds	m/s^2
$a_{hv,\,max}$	is the time averaged weighted single for maximum **Continuous operating**	m/s^2
a_h	arithmetic mean value of $\overline{a_{hv}}$ values for all operators for one hand position	m/s^2
$\overline{a_h}$	arithmetic mean value of a_h values for one hand position on several machines	m/s^2
a_{hd}	declared vibration emission value	m/s^2
s_{n-1}	standard deviation for a test series (for a sample, s)	m/s^2
σ_R	standard deviation of reproducibility (for a population, σ)	m/s^2
C_v	coefficient of variation for a test series	
N_{max}	maximum possible drive sequence	1/s
K	Uncertainty	m/s^2

5 Basic standards and vibration test code

This document is based on the requirements of ISO 20643 and corresponds to its structure in respect of clause subjects and numbering except for the annexes.

Annex A presents a model test report and Annex B the means for determining the uncertainty, K.

6 Description of the family of machines

This document applies to hand-held machines intended for fastener driving tools.

Figures 1 to 5 show examples of typical fastener driving tools covered by this document.

Figure 1 — Gas fastener driving tool

Figure 2 — Battery fastener Driving tool

Figure 3 — Electric fastener driving tool

Figure 4 — Pneumatic fastener driving tool