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First edition
2005-01-15

Mechanical vibration — Hand-held and hand-guided machinery — Principles for evaluation of vibration emission

Vibration mécanique — Machines tenues et guidées à la main — Évaluation d'émission de vibration



Reference number
ISO 20643:2005(E)

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Published in Switzerland

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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 20643 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 118, *Compressors, pneumatic tools and pneumatic machines*, Subcommittee SC 3, *Pneumatic tools and machines*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, read "...this European Standard..." to mean "...this International Standard...".

For the purposes of this International Standard, the CEN annex regarding fulfilment of European Council Directives has been removed.

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Foreword

This document (EN ISO 20643:2005) has been prepared by Technical Committee CEN/TC 231 "Mechanical vibration and shock", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 118 "Compressors, pneumatic tools and pneumatic machines".

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 July 2005, and conflicting national standards shall be withdrawn at the latest by July 2005.

This document supersedes EN 1033:1995.

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 EC Directive(s).

For relationship with EC Directive(s), see informative Annex ZA, which is an integral part of this document.

This document provides concrete rules for the application of EN 12786 in relation to vibration test codes. It is complementary to EN 12096.

New or revised vibration test codes in the standards series EN 28662/EN ISO 8662 for portable hand-held machines will be based on this document. All currently existing parts of EN 28662/EN ISO 8662, however, are based on EN 28662-1:1993. It is envisaged that EN 28662-1:1993 will be withdrawn when all parts of the series EN 28662/EN ISO 8662 have been revised in accordance with 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

Human exposure to mechanical vibration from hand-held or hand-guided machinery can interfere with comfort, working efficiency and, in some circumstances, health and safety. According to EN ISO 12100-2 the risks created by vibrating machinery need to be minimized and the residual risk from vibration need to be noted in the relevant instruction handbook. This, ideally, will be based on the vibration emission magnitude reported in accordance with this document or the relevant vibration test code, but additional information for use may be required (see Clause 6 in EN ISO 12100-2:2003).

It is possible that the type test method may not identify all the mechanisms that generate vibration when the machine is used in the real operational environment. Factors such as the workpiece, the process and the operator can have an important influence on the vibration magnitudes. For this reason the type test measurements cannot replace field measurements to evaluate vibration exposure at the workplace, but should be sufficiently representative to be able to be used for preliminary assessment of risk.

Vibration magnitudes in type tests shall be within the range of measurements made in the field, but with less variability. Type tests require accurate and reproducible conditions. It is essential that different laboratories obtain the same results within specified limits. This requires that the process or way in which the machine is measured is precisely defined. The operating conditions should be well defined, they should preferably be a real process, typical of that for which the machine is designed. If it is intended to be used for a variety of tasks and the vibration is affected significantly by the task, then more than one task might be used in determination of vibration emission. In some cases an artificial process may be used which is not in line with the typical use of the machine in the field but which provides equivalent data. If two machines produce significantly different magnitudes of vibration under real conditions, then the test should be capable of demonstrating this difference.

This document is intended to assist technical standardization committees responsible for specific types of machinery in preparing vibration test codes to ensure that such vibration test codes:

- enable users to make comparisons and to check the declared vibration emission values;
- are as homogeneous as possible with each individual test code having the same basic structure;
- are in full accordance with basic type-B standards on measurement of vibration emissions;
- reflect the latest technical knowledge of methods of determining the vibration emissions from the specific family of machinery under consideration.

A vibration test code for a family of machinery prepared in accordance with this document:

- a) produces vibration emission data which allow the determination of the vibration state-of-the-art for a family of machinery and the identification of a machine which has significantly greater or smaller vibration emission;
- b) produces vibration emission values and uncertainties suitable for comparing the emissions of machinery of the same type irrespective of the date or location of the testing;
- c) produces vibration emission values and uncertainties corresponding to the upper quartile of vibration magnitudes resulting from intended uses of the machinery;
- d) specifies the operating conditions of the machine during testing that are, so far as practicable, representative of normal use;
- e) identifies parameters that have a significant influence on the vibration emission of the machinery;
- f) specifies installation and mounting conditions of transducers, measurement positions and measurement directions;

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- g) prescribes equipment used during testing and
- h) requires recording of the values of machinery operating parameters that may influence vibration emission.

This document can be used, in the absence of an agreed vibration test code, as a guide to determine vibration emission values and to define test parameters that may influence vibration emission to be recorded.

This document is a type-B standard as stated in EN ISO 12100-1.

The provisions of this document may be supplemented or modified by a type-C standard. However, for machines which are covered by the scope of a type-C standard and which have been designed and built according to the provisions of that standard, the provisions of that type-C standard take precedence over the provisions of this type-B standard.