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**Forestry and gardening machinery —  
Vibration test code for portable  
hand-held machines with internal  
combustion engine — Vibration at the  
handles**

**iTECH STANDARDS**  
*Machines forestières et machines de jardin — Code d'essai des  
vibrations pour machines portatives tenues à la main à moteur à  
combustion interne — Vibrations au niveau des poignées*  
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## Contents

Page

<b>Foreword</b>	iv
<b>Introduction</b>	v
<b>1 Scope</b>	1
<b>2 Normative references</b>	1
<b>3 Terms and definitions</b>	1
<b>4 Vibration quantities to be measured and determined</b>	2
<b>5 Instrumentation</b>	2
5.1 General	2
5.2 Accelerometer	2
5.3 Fastening of accelerometer	2
5.4 Calibration	2
5.5 Speed indicator	3
<b>6 Measurement direction and location</b>	3
<b>7 Test and operating conditions of machine</b>	3
<b>8 Measurement and calculation</b>	4
8.1 General	4
8.2 Validity of measured data	5
<b>9 Information to be reported</b>	5
<b>10 Declaration and verification of vibration values</b>	6
<b>Annex A (normative) Chain-saws</b>	8
<b>Annex B (normative) Brush-cutters, grass-trimmers and hand-held edgers</b>	12
<b>Annex C (normative) Pole-mounted powered pruners</b>	16
<b>Annex D (normative) Hedge trimmers</b>	19
<b>Annex E (normative) Garden blowers/vacuums</b>	24
<b>Annex F (informative) Summary of results from interlaboratory tests (2007-2008) on a chain-saw, brush saw and grass-trimmer</b>	28
<b>Bibliography</b>	29

## 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](http://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](http://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 of 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 [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 17, *Manually portable forest machinery*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 144, *Tractors and machinery for agriculture and forestry*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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This third edition cancels and replaces the second edition (ISO 22867:2011), which has been technically revised.

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

- the scope has been expanded to include hand-held edgers;
- [Clause 9](#) (Information to be reported) has been amended to include “method used for in situ check of the instrumentation system”;
- the accelerometer position for pole-mounted powered pruners and long-reach hedge trimmers has been newly defined to better reflect handling of the machine in use;
- the engine speed tolerance for the operation mode “full load” for chain-saws has been broadened from  $3,5\text{ s}^{-1}$  to  $4,5\text{ s}^{-1}$ , to account for feasibility when cutting wood;
- hand-held edgers have been included in [Annex B](#);
- the definition of the position of the accelerometer on the front handle of pole mounted pruners in [Annex C](#) has been improved and [Figure C.1](#) has been modified accordingly;
- the definition of the position of the accelerometer on the front handle of long reach hedge trimmers in [Annex D](#) has been improved and [Figure D.3](#) has been modified accordingly.

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](http://www.iso.org/members.html).

## Introduction

This document is a type-C standard as stated in ISO 12100:2010.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organisations, market surveillance, etc.)

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e. g. for maintenance (small, medium and large enterprises);
- consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document. The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

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 code specified in this document is based on ISO 20643:2008, which gives general specifications for the measurement of the vibration emission of hand-held machinery. It differs from ISO 20643:2008 in the number of operators required to be involved in the test, with ISO 20643:2008 requiring at least three operators and this document only one. Another difference is that this document primarily positions the transducers next to the hand in the area between the thumb and the index finger, where they present the least disturbance to the operator gripping the machine.

The determination of vibration characteristics is primarily used for

- manufacturer's declarations,
- comparing data between machines in the machine family concerned,
- development work at the design stage, and
- the estimation of the vibration risk considering the specific conditions (parameters).

The use of this vibration test code ensures reproducibility of the determination of the vibration characteristics. Measurements made during particular operating modes are of interest for assessment of the vibration exposure, for example, over a typical working day.

The work cycles chosen for this test code are based on the following considerations of application:

- a) chain-saws with an engine displacement of  $< 80 \text{ cm}^3$  are used for various operations, including felling, bucking and delimiting;
- b) chain-saws with an engine displacement of  $\geq 80 \text{ cm}^3$  are normally used for felling and bucking.

Delimiting causes the saw to run at racing speed; therefore, racing is included only for saws with an engine displacement  $< 80 \text{ cm}^3$ .