First edition
2007-06-15

Vibration in hand-held tools — Vibration measurement methods for grinders — Evaluation of round-robin test

Vibration des machines à moteur portatives — Méthodes de mesure des vibrations des meuleuses — Évaluation d'essais Round Robin

Reference number
ISO/TR 27609:2007(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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/TR 27609 was prepared by Technical Committee ISO/TC 118, *Compressors and pneumatic tools, machines and equipment*, Subcommittee SC 3, *Pneumatic tools and machines*.

Introduction

At the time of publication of this Technical Report, it was intended that ISO 8662-4, which deals with hand-held grinders, be revised and harmonized with ISO 20643. The latter International Standard requires, among other provisions, that the vibration emission measurements be made in three directions, with the declared values related to the upper quartile of real-use vibration.

A round-robin test was made to gain an idea of the upper limits of real-use vibration and to establish a test method fulfilling the three-direction requirement. Four grinders of different sizes — both with, and without, auto-balancing units — were measured by seven laboratories. Measurements were made according to detailed test instructions. The laboratories were manufacturers and health and safety authorities in Europe.

Two methods were evaluated by the round-robin test: one using a redesigned unbalance disc and the other by grinding on mild steel using standard type 27 grinding wheels.

The result shows that the unbalance disc test method can be used for estimating the real-use vibration as long as the grinder is not fitted with an auto-balancing unit. If such a unit is fitted, the real-use vibration is underestimated by that method. Methods for estimating the real-use vibration level for grinders fitted with auto-balancing units are not discussed in this Technical Report.

A real grinding test is not suitable for obtaining a declared value, as the spread for this method is large. Furthermore, in order to obtain enough data to handle the large spread, the time consumption is unreasonably high.