
**Hand-held non-electric power tools —
Noise measurement code — Engineering
method (grade 2)**

*Machines à moteur portatives non électriques — Code pour le mesurage
du bruit — Méthode d'expertise (classe de précision 2)*



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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 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15744 was prepared by Technical Committee ISO/TC 118, *Compressors, pneumatic tools and pneumatic machines*, Subcommittee SC 3, *Pneumatic tools and machines*.

Annexes A, B and C of this International Standard are for information only.

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Introduction

The noise test code presented by this International Standard gives methods for determining and declaring the noise emission values of hand-held non-electric power tools: i.e. the total noise level from the power tool expressed as sound power level and as the emission sound pressure level at the work station. These methods have been designed to give results that make it possible to compare the acoustic performance of various power tools.

The power tools are either run at no load, when this gives a representative value, or in an on-load condition but with the process noise muffled so that it is well below the noise level of the power tool. The methods were chosen to give a satisfactory reproducibility of results and are based on present practice in industry.

For many power tools in a real work situation the noise from the process dominates the total noise emission in actual use. The process noise varies within very wide limits and cannot be predicted. Users are cautioned that the emission sound pressure level as determined by this code may not be representative of actual operator exposure levels, which are unique characteristics of individual applications and environmental factors beyond the control of the manufacturers of the equipment covered by this International Standard, and are under the exclusive control (and therefore the responsibility) of the users of the equipment.

This International Standard was prepared with the assistance of both PNEUROPE, the European body representing manufacturers of compressors, vacuum pumps, pneumatic tools, pneumatic machines and allied equipment, and CAGI, the compressed air and gas institute, in the United States.

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Hand-held non-electric power tools — Noise measurement code — Engineering method (grade 2)

1 Scope

This International Standard specifies methods for the measurement, determination and declaration of the noise emission from hand-held non-electric power tools. It prescribes the loading and working conditions under which can be determined

- a) the noise emission, under specified load conditions, expressed as the sound power level, and
- b) the emission sound pressure level at the work station under specified load conditions.

This International Standard is applicable to typical hand-held non-electric power tools including rotary tools, orbital and random orbital sanders, rotary and non-rotary reciprocating and percussive tools and a variety of assembly tools. It is not applicable to cartridge-operated tools, fastener driving tools (e.g. nailers, staplers) or any tool powered by an internal combustion engine, nor is it applicable to breakers or other power tools which, when placed on the market, are required to meet the provisions of legislation specifying test methods and imposing limits on noise emission from, for example, equipment used outdoors.

NOTE This noise measurement code could also be applied to other equipment such as winches, pneumatic motors, auto-feed drills and tappers, pumps, hydraulic motors and screw feed systems, provided their principles of operation were in accordance with those of pneumatic and hydraulic equipment.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 2787:1984, *Rotary and percussive pneumatic tools — Performance tests*

ISO 3744:1994, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane*

ISO 4871:1996, *Acoustics — Declaration and verification of noise emission values of machinery and equipment*

ISO 5391, *Pneumatic tools and machines — Vocabulary*

ISO 8662-2, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 2: Chipping hammers and riveting hammers*

ISO 8662-3, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 3: Rock drills and rotary hammers*

ISO 8662-7, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 7: Wrenches, screwdrivers and nut runners with impact, impulse or ratchet action*

ISO 8662-8, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 8: Polishers and rotary, orbital and random orbital sanders*

ISO 8662-14, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 14: Stone-working tools and needle scalars*

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*

IEC 60651, *Sound level meters*

IEC 60804, *Integrating-averaging sound level meters*

EN 292-2:1991, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles and specifications*

3 Terms, definitions and symbols

For the purposes of this International Standard, the terms and definitions given in ISO 5391 and the following apply. For the symbols, see Table 1.

3.1 declared dual-number noise emission value

L, K

measured noise emission value, L , and its associated uncertainty K , both rounded to the nearest decibel

[ISO 4871:1996]

3.2 emission

airborne sound radiated by a well-defined noise source (e.g. the machine under test)

[ISO 11203:1995]

NOTE Emission values may be incorporated in a product label or published in a product specification, or both these. The basic noise emission descriptors are the sound power level of the product itself and the emission sound pressure levels at the work station and at other specified positions (if any) in the vicinity of the product.

3.3 emission sound pressure

p

sound pressure, at a specified position near a noise source, when the source is in operation under specified operating and mounting conditions on a reflecting plane surface, excluding the effects of background noise as well as the effects of reflections other than those from the plane or planes permitted for the purpose of the test; expressed in pascals

[ISO 11203:1995]

3.4 emission sound pressure level

L_p

ten times the logarithm to the base 10 of the ratio of the square of the emission sound pressure, $p^2(t)$, to the square of the reference sound pressure, p_0^2 , measured with a particular time weighting and a particular frequency weighting selected from those defined in IEC 60651; expressed in decibels

NOTE 1 The reference sound pressure is 20 μ Pa.

NOTE 2 Adapted from ISO 11203:1995.