
**Hand-held portable power tools —
Measurement of vibrations at the handle —
Part 13:
Die grinders**

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

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Partie 13: Meuleuses d'outillage

ISO 8662-13:1997

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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.

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.

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International Standard ISO 8662-13 was prepared by Technical Committee ISO/TC 118, *Compressors, pneumatic tools and pneumatic machines*, Subcommittee SC 3, *Pneumatic tools and machines*.

ISO 8662 consists of the following parts, under the general title *Hand-held portable power tools — Measurement of vibrations at the handle*:
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- *Part 1: General*
- *Part 2: Chipping hammers and riveting hammers*
- *Part 3: Rock drills and rotary hammers*
- *Part 4: Grinders*
- *Part 5: Pavement breakers and hammers for construction work*
- *Part 6: Impact drills*
- *Part 7: Wrenches, screwdrivers and nut runners with impact, impulse or ratchet action*
- *Part 8: Polishers and rotary, orbital or random sanders*

- *Part 9: Rammers*
- *Part 10: Nibblers and shears*
- *Part 11: Fastener driving tools (nailers)*
- *Part 12: Saws and files with reciprocating action and saws with oscillating or rotating action*
- *Part 13: Die grinders*
- *Part 14: Stone-working tools and needle scalers*

Annex A of this part of ISO 8662 is for information only.

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Introduction

This part of ISO 8662 specifies how a type test for the measurement of vibration at the handle of portable die grinders shall be performed. It supplements ISO 8662-1, which gives the general specifications for the measurement of vibration at the handles of hand-held power tools. It specifies the operation of the tool under type test and other requirements for the performance of the type test.

It has been found that vibrations generated by a die grinder grinding on a workpiece vary considerably. The variance is partly due to differences in the unbalance of the die grinder together with its burr or mounted point. The unbalance also changes when the mounted point is used for grinding. In order to provide a method which gives good measurement reproducibility, the procedure adopted in this part of ISO 8662 uses a test device of known unbalance, mounted in a power tool and running free. Although the values measured are not obtained when grinding, there is a good correlation between the values obtained when the die grinder is running free at nominal working speed with a test device mounted and those obtained when grinding.

The principle of the operation of a die grinder is that the driving medium causes an output spindle to rotate. The spindle is adapted to carry a cutting or an abrasive device for material removal.

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Hand-held portable power tools — Measurement of vibrations at the handle —

Part 13: Die grinders

1 Scope

This part of ISO 8662 specifies a laboratory method for measuring the vibration at the handles of power-driven die grinders where the inserted tool is mounted in a collet. It is a type-test procedure for establishing the vibration value at the handles of the die grinder when fitted with a specified test device.

This part of ISO 8662 applies to die grinders which are pneumatically driven. A typical die grinder is shown in figure 1.

It is intended that the results be used to compare different models of the same power tool, i.e. those power tools intended to be used with the same burr or mounted point (same diameter and same maximum peripheral speed).

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Dimensions in millimetres

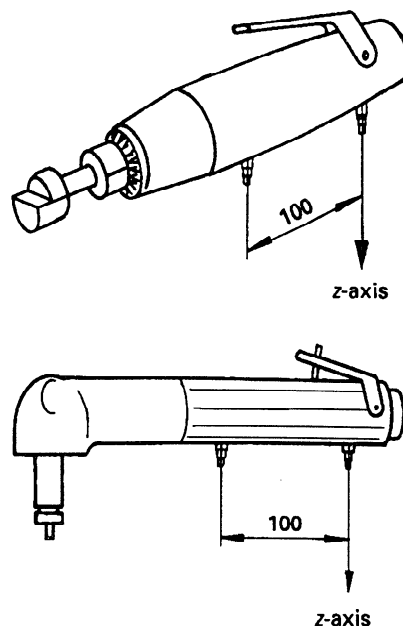


Figure 1 — Typical die grinders — Measurement direction and example of position of transducers

2 Normative references

The following standards provide provisions which, through reference in this text, constitute provisions of this part of ISO 8662. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this part of ISO 8662 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

ISO 8662-1:1988, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 1: General*.

3 Quantities to be measured

Quantities to be measured are as follows:

- a) the root-mean-square (r.m.s.) acceleration in accordance with ISO 8662-1:1988, 3.1, presented as a weighted acceleration in accordance with ISO 8662-1:1988, 3.3;
- b) the air pressure;
- c) the rotational frequency.

4 Instrumentation

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4.1 General

The specifications for the instrumentation given in ISO 8662-1:1988, 4.1 to 4.6 apply.
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4.2 Transducer

The specification for the transducers given in ISO 8662-1:1988, 4.1 applies.

4.3 Mechanical filters

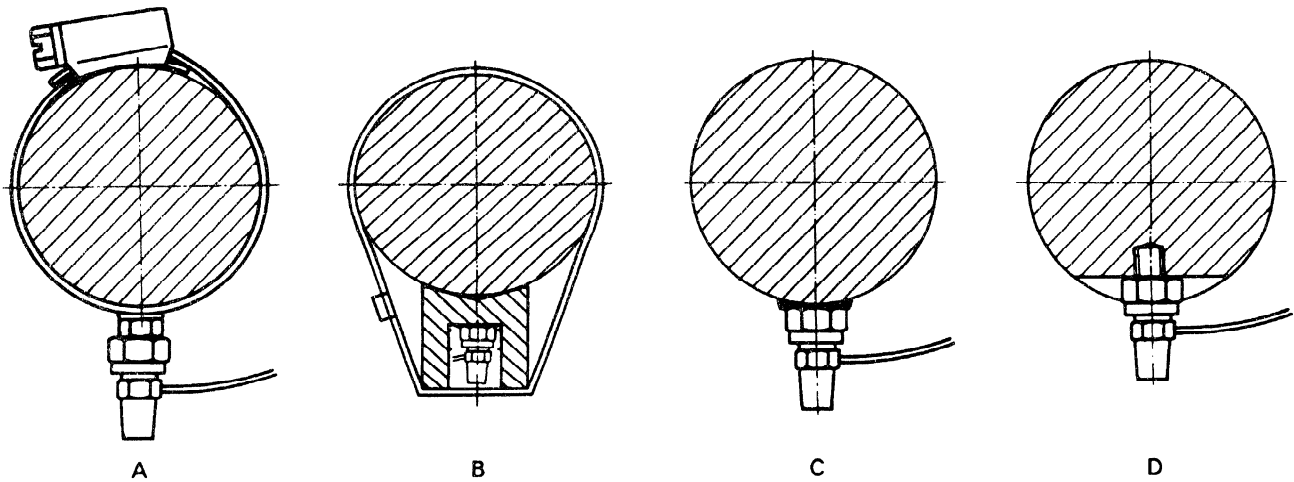
It is normally not necessary to use a mechanical filter for measurements in accordance with this part of ISO 8662 (see ISO 8662-1:1988, 4.3).

4.4 Fastening of the transducer

Fastening of the transducers on the power tool handle shall be in accordance with ISO 8662-1:1988, 4.2. Small transducers may be affixed by using a suitable adhesive wax on a flat surface. In all cases the fastening of the transducers shall be in accordance with the transducer manufacturer's instructions (see figure 2).

If the handle has a soft resilient cover, a clamp, on which the transducer is mounted, shall be tightened securely around it. Alternatively a special adaptor may be used, see ISO 8662-1:1988, 4.2.

NOTE — The test report should state the action taken, i.e. solid clamping or use of an adaptor.



The transducer may be mounted in four ways:

- A: Using a hose clip to which a block is brazed or welded;
- B: Using an adaptor to which the transducer is screwed; the adaptor is mounted with the use of plastic straps;
- C: Using a suitable adhesive wax on a flat surface;
- D: Grinding a flat surface and drilling and tapping a hole.

Figure 2 — Options for the fastening of transducers

4.5 Auxiliary equipment

The supply air pressure shall be measured using a precision class pressure gauge in accordance with ISO 2787.

The rotational frequency can be measured using a tachometer with an accuracy of at least $\pm 1\%$. The rotational frequency can also be determined using the signal from the vibration transducer.

4.6 Calibration

Calibration shall be carried out in accordance with ISO 8662-1:1988, 4.8.

5 Measurement direction and measurement location

5.1 Measurement direction

Measurements shall be made on the handle in one direction only, perpendicular to the rotational axis for straight die grinders and parallel to the output rotational axis for angle die grinders (see figure 1).

5.2 Measurement location

Measurements shall be made on the handle where the operator normally holds the power tool. For die grinders with a support handle, measurements shall be made at this handle as well.

The positions of the transducers shall be at the front of and behind the hand holding the power tool (see figure 1) and preferably attached to the underside of the handle. The distance between the transducers shall be 100 mm.

If the grip length is less than 100 mm, then the transducers shall be mounted at the extremities of the grip surface, and the positions noted in the test report.