INTERNATIONAL STANDARD

ISO 8662-9

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

Part 9: Rammers

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

Partie 9: Marteaux fouloirs

Reference number
ISO 8662-9:1996(E)

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.

International Standard ISO 8662-9 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*:

— *Part 1: General*

— *Part 2: Chipping hammers and riveting hammers*

— *Part 3: Rock drills and rotary hammers*

— *Part 3: 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 and random orbital sanders*

— *Part 9: Rammers*

— *Part 10: Nibblers and shears*

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— *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.

Introduction

This part of ISO 8662 specifies how a type test for the measurement of vibrations, at the handles of rammers shall be performed. It supplements ISO 8662-1, which gives the general specifications for the measurement of vibrations at the handles of handheld power-driven tools. It specifies the operation of the tool under type test and other requirements for the performance of the type test.

Vibration measurements made on rammers operating in typical work situations, e.g. ramming sand, have been found to be relatively reproducible. However, the use of foundry sand as a load for a type test is cumbersome because the sand has to be mixed after each trial. It has therefore been concluded that the type test shall be made on an artificial load (neoprene materials) so designed that acceleration values measured correspond to those found in typical work situations. The reproducibility of the proposed method has been found to be good.

The principle of the operation of a rammer is that the driving medium causes a piston, extended by a rod on the end of which a ramming plate is fixed, to move back and forth. The piston also generates a reaction force on the housing of the machine, which is the cause of vibration.

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

Part 9:
Rammers

1 Scope

This part of ISO 8662 specifies a laboratory method of measuring the vibrations at the handles of rammers, backfill-rammers, pawing rammers and sand rammers for use in foundries, on building sites, etc. It is a type test procedure for establishing the magnitude of vibrations at the handles of the power tool when operating on the specified load.

It is intended that the results obtained be used to compare different power tools or different models of the same type of power tool. Although the magnitudes measured are obtained in an artificial operation, they will give an indication of the values that would be found in a real work situation.

2 Normative references

The following standards contain 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:

a) acceleration according to ISO 8662-1:1988, 3.1, presented as weighted acceleration according to ISO 8662-1:1988, 3.3;

NOTE — Frequency analysis can be omitted if the absence of d.c. shift can be proved by other means.

b) feed force;

c) air or hydraulic pressure;

d) blow frequency.

4 Instrumentation

4.1 General

For specification of instrumentation see ISO 8662-1:1988, 4.1 to 4.6.

4.2 Transducer

For specification of transducer see ISO 8662-1:1988, 4.1.

4.3 Mechanical filter

Normally it is necessary to use a mechanical filter for measurements according to this part of ISO 8662 (see ISO 8662-1:1988, 3.2).

4.4 Fastening of transducer

Fastening of transducer and mechanical filter shall be according to figure 1 and ISO 8662-1:1988, 4.2.

4.5 Calibration

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

4.6 Auxiliary equipment

The air or hydraulic pressure shall be measured using a manometer of precision class.

The blow frequency of the tool during measurement can be determined from a narrow-band analysis of the vibration signal or using a frequency counter.

The feed force can be measured with a scale (see 6.3).

5 Measurement direction and measurement location

5.1 Measurement direction

Measurements shall be made in a direction parallel with the percussive direction, the y-direction (see figure 2).

5.2 Measurement location

Measurements shall be made at all gripping zones, where the operator normally holds the tool and applies the feed force.

If it can be proved that all the gripping zones have the same vibration value, measurement in the main gripping zone alone is acceptable.

The normal position of the transducer shall be halfway along the length of the gripping zone, except in the case where the trigger is placed so as to make this unsuitable (see figure 2).

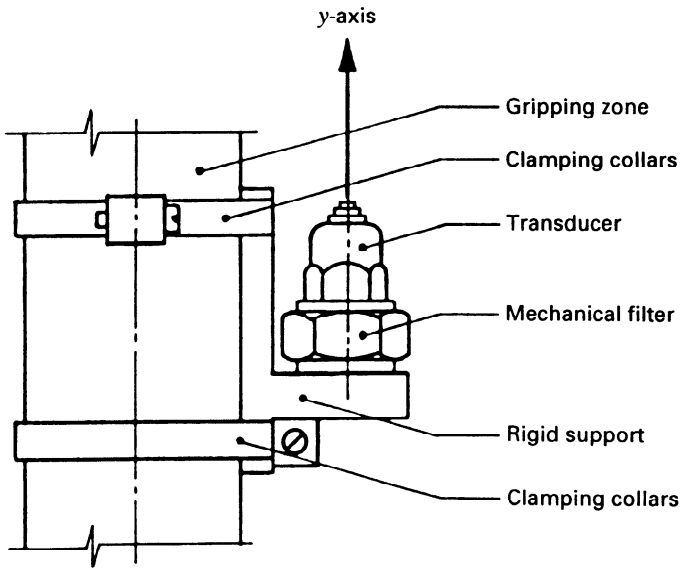


Figure 1 — Example of fastening of transducer

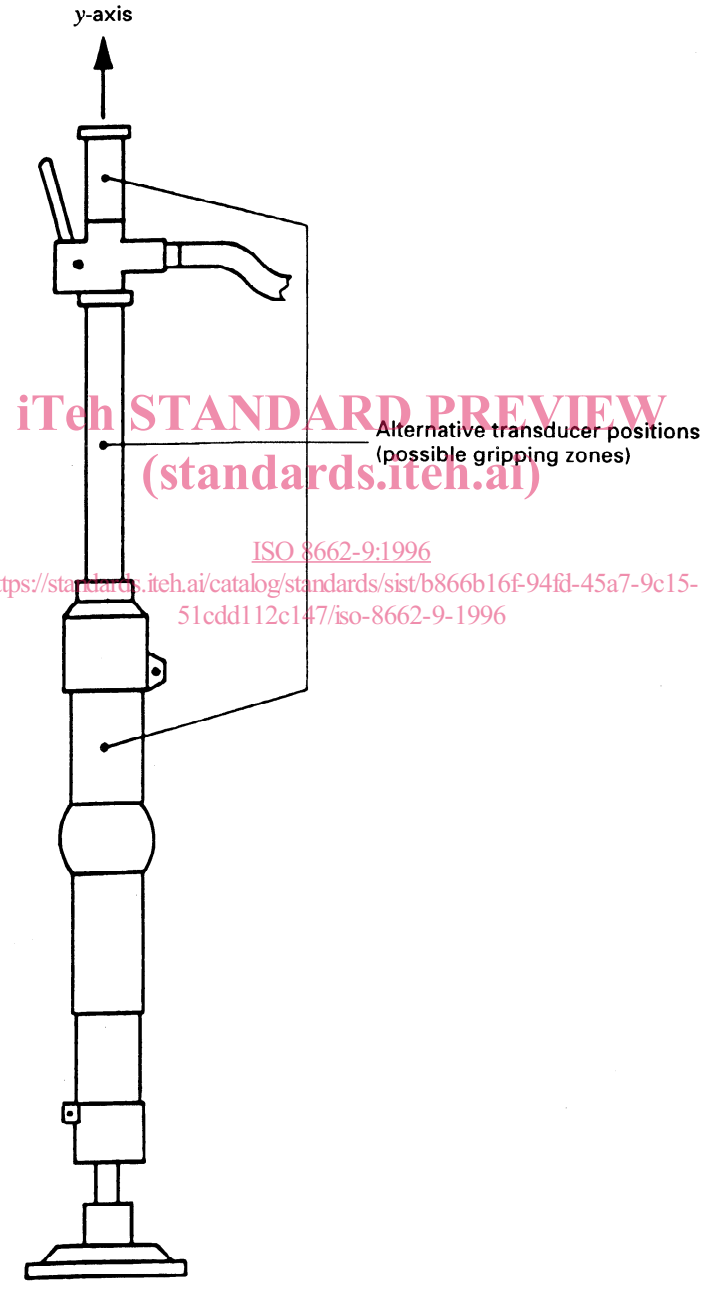


Figure 2 — Rammer — Measuring direction and alternative transducer positions

6 Determination of working procedure

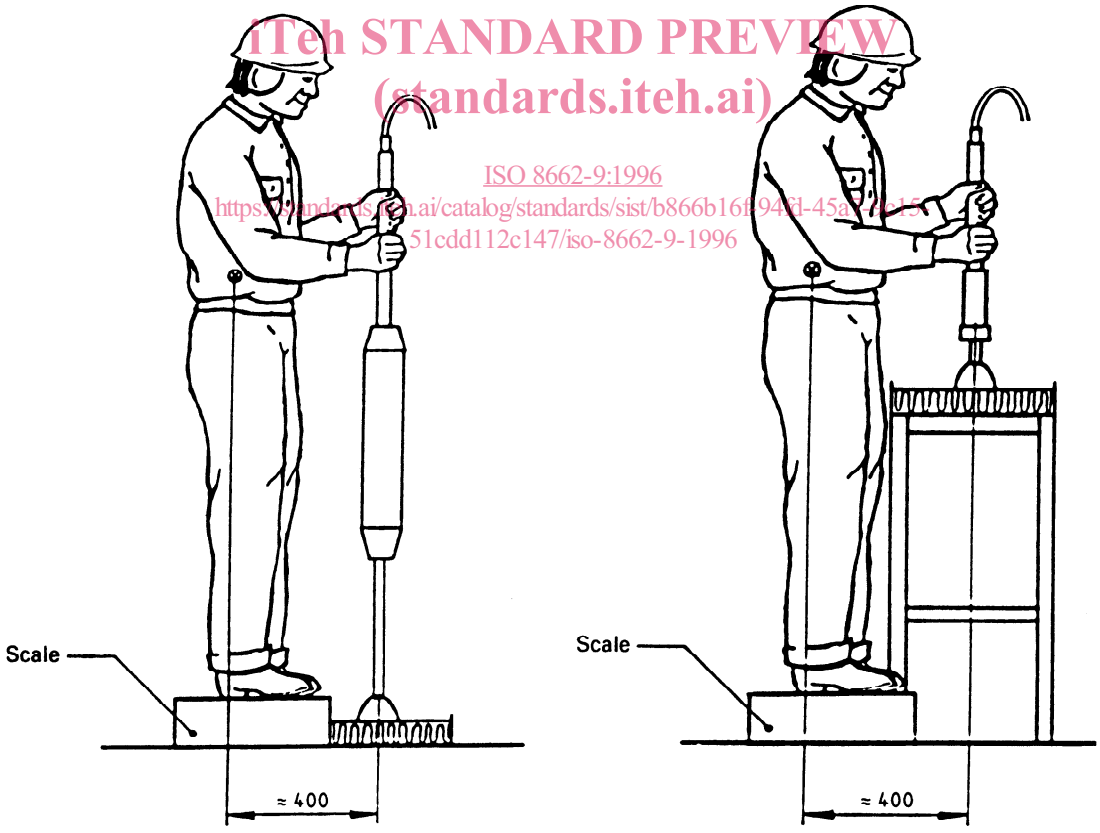
6.1 General

Measurements shall be carried out on a new, properly serviced and lubricated power tool.

During test the power tool shall operate at rated pressure and be used according to the manufacturer's specifications. The operation shall be stable and smooth (see 6.3).

During the test the energy absorber shall be arranged so that the operator can have an upright posture and work the power tool vertically downwards while performing the test. The operator shall be able to hold the machine comfortably during work (see figure 3).

Dimensions in millimetres



a) Rammer with extended handle

b) Table rammer

Figure 3 — Working position of operator

6.2 Energy absorber

The energy absorber to be used consists of a 500 mm × 500 mm steel box of wall thickness ≈ 3 mm containing a neoprene foam energy-absorbing material which has a hardness of 40 Shore A to 50 Shore A and a thickness of 20 mm (see figure 4).

NOTE — Such a box has been found to give an appropriate absorption of the shock wave and consistent reflection waves back to the power tool, as would be found in a normal working situation.

6.3 Feed force

The feed force to be applied, in addition to the weight of the power tool, shall ensure that the rammer operates at its normal level of performance, giving a smooth and stable operation.

This is achieved by a feed force, F_A, which, expressed in newtons, is approximately 10 times the value of the mass, in kilograms, of the power tool. The chosen feed force shall be maintained within the range of ± 10 %.

NOTE — As an example, if the power tool has a mass of 3,5 kg, then the feed force should be approximately 35 N.

For vibration-controlled rammers, the feed force to be used shall be decided in a pre-test.

The feed force F_A can be monitored during the test by letting the operator stand on a scale. The feed force is then the operator's own mass minus the reading on the scale.

Dimensions in millimetres

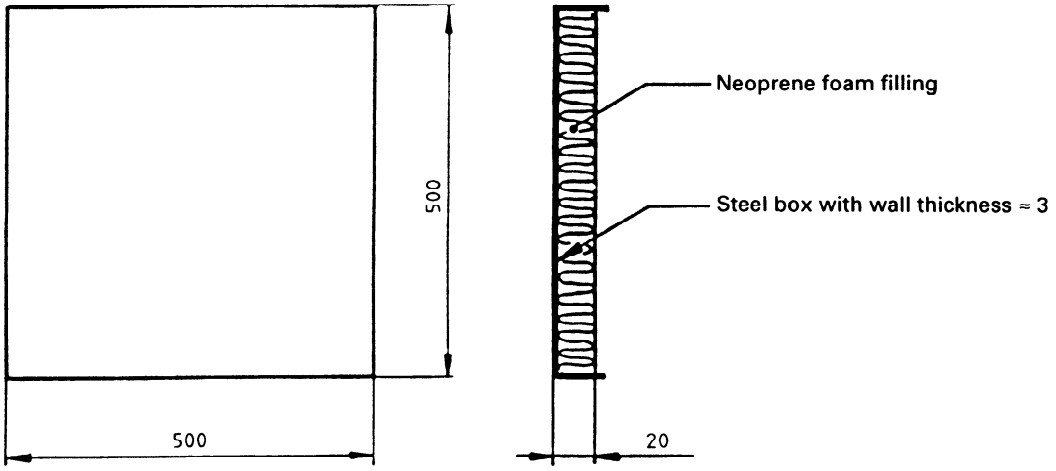


Figure 4 — Energy absorber (steel box filled with neoprene foam)