

**Kantavad käeshoitavad ajamiga tööriistad.
Vibratsiooni mõõtmine käepidemetal. Osa 5:
Sillutiselõhkurid ja ehitustöödel kasutatavad
vasarad**

Hand-held portable power tools - Measurement of
vibrations at the handle - Part 5: Pavement
breakers and hammers for construction work

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 28662-5:1999 sisaldab Euroopa standardi EN 28662-5:1994+A1:1995 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 23.11.1999 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 28662-5:1999 consists of the English text of the European standard EN 28662-5:1994+A1:1995.

This standard is ratified with the order of Estonian Centre for Standardisation dated 23.11.1999 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

The standard is available from Estonian standardisation organisation.

ICS 13.160, 25.140.01, 25.140.10

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EUROPEAN STANDARD

EN 28662-5

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 1994

UDC (622.232.3+621.926.2)-182.4:534.1.08

Descriptors: Power-operated tools, portable equipment, portable electric machine tools, pneumatic drills, concrete breakers, handles, vibration tests, measurements, vibration

English version

Hand-held portable power tools - Measurement of vibrations at the handle - Part 5: Pavement breakers and hammers for construction work (ISO 8662-5:1992)

Machines à moteur portatives - Mesurage des vibrations au niveau des poignées - Partie 5: Brise-béton, marteaux démolition et marteaux piqueurs (ISO 8662-5:1992)

Handgehaltene motorbetriebene Maschinen - Messung mechanischer Schwingungen am Handgriff - Teil 5: Aufbruchhämmer und Spatenhämmer (ISO 8662-5:1992)

This European Standard was approved by CEN on 1994-05-20. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

According to Resolution 13/1992, taken in April 1992 at the third meeting of CEN/TC 231 "Mechanical vibration and shock", the International Standard

ISO 8662-5:1992 Hand-held portable power tools; Measurement of vibrations at the handle;
Part 5: Pavement breakers and hammers for construction work

was submitted under the Unique Acceptance Procedure for approval as European Standard.

The result of the Formal Vote was positive.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 1994, and conflicting national standards shall be withdrawn at the latest by November 1994.

In accordance with the CEN/CENELEC Internal Regulations, following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of the International Standard ISO 8662-5:1992 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in annex ZA (normative).

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Annex ZA (normative)
Normative references to international publications
with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
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	EN 28662-1	1992

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ICS 13.160; 25.140.10

Descriptors: tools, power-operated tools, portable equipment, portable electric machine tools, pneumatic equipment, hydraulic equipment, hand tools, concrete breakers, pick hammers, vibration, tests, vibration tests

English version

**Hand-held portable power tools - Measurement of
vibrations at the handle - Part 5: Pavement
breakers and hammers for construction work
(ISO 8662-5:1992)**

Machines à moteur portatives - Mesurage des
vibrations au niveau des poignées - Partie 5:
Brise-béton, marteaux démolition et marteaux
piqueurs (ISO 8662-5:1992)

Handgehaltene motorbetriebene Maschinen -
Messung mechanischer Schwingungen am Handgriff
- Teil 5: Aufbruchhämmer und Spatenhämmer
(ISO 8662-5:1992)

This amendment 1 modifies the European Standard EN 28662-5:1994. This amendment was approved by CEN on 1995-05-18. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

The text of this Amendment EN 28662-5:1994/A1:1995 to the European Standard EN 28662-2:1994 has been prepared by the Technical Committee CEN/TC 231 "Mechanical vibration and chock" the secretariat of which is held by DIN.

This Amendment to the European Standard EN 28662-5:1994 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

This Amendment to the European Standard EN 28662-5:1994 shall be given the status of a National Standard, either by publication of an identical text or by endorsement, at the latest by February 1996, and conflicting national standards shall be withdrawn at the latest by February 1996.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

Endorsement Notice

The text of the International Standard ISO 8662-5:1992 has been approved by CEN as a European Standard with the following common modifications:

The following common modifications have to be made to EN 28662-5:1994.

- In the title and the text, replace *Hammers for construction work* by *Pick hammers*
- Replace the last paragraph of the scope by the following:
It is intended that the results obtained can be used to compare different power tools or different models of the same type of power tools.
- Subclause 5.1, delete the 2nd sentence, note 3 and the corresponding annex A.
- Figure 1, modify the title into: *Position and example of fastening of the transducer and measurement direction*
- Figures 2 and 3, delete the drawing of the energy absorber.
- Subclause 6.2, modify the 2nd paragraph and note 4 as follows:
The energy absorber consists of a steel tube which is firmly mounted on a rigid base plate having a mass according to table 1 to prevent the tool from jumping, and filled with balls of hardened steel. At the top of the steel tube, resting on the balls, is inserted a test tool on which the power tool works. The test tool should be preferably made in one part but it is acceptable for vibration measurements to have this tool made of two parts as shown in figure 4. The steel tube shall have a hardness of 60 HRC \pm 2 HRC, the anvil and test tool shall have a hardness of 55 HRC \pm 2 HRC and the steel balls shall have a hardness of 62 HRC \pm 3 HRC.

NOTE 4 — A cooling device may be provided with the energy absorber.

- Table 1, replace by the following:

Nominal shank diameter d mm	Steel tube diameter D mm ± 1	Nominal steel ball diameter mm	Ball column height H mm ± 4	Minimum mass of the base kg
$d < 23$	40	3,96 or 4	100	200
$d \geq 23$	60	3,96 or 4	150	300

- Subclause 6.2, delete the 4th paragraph (under table 1).
- Replace figure 4 by the following:

Dimensions in millimetres

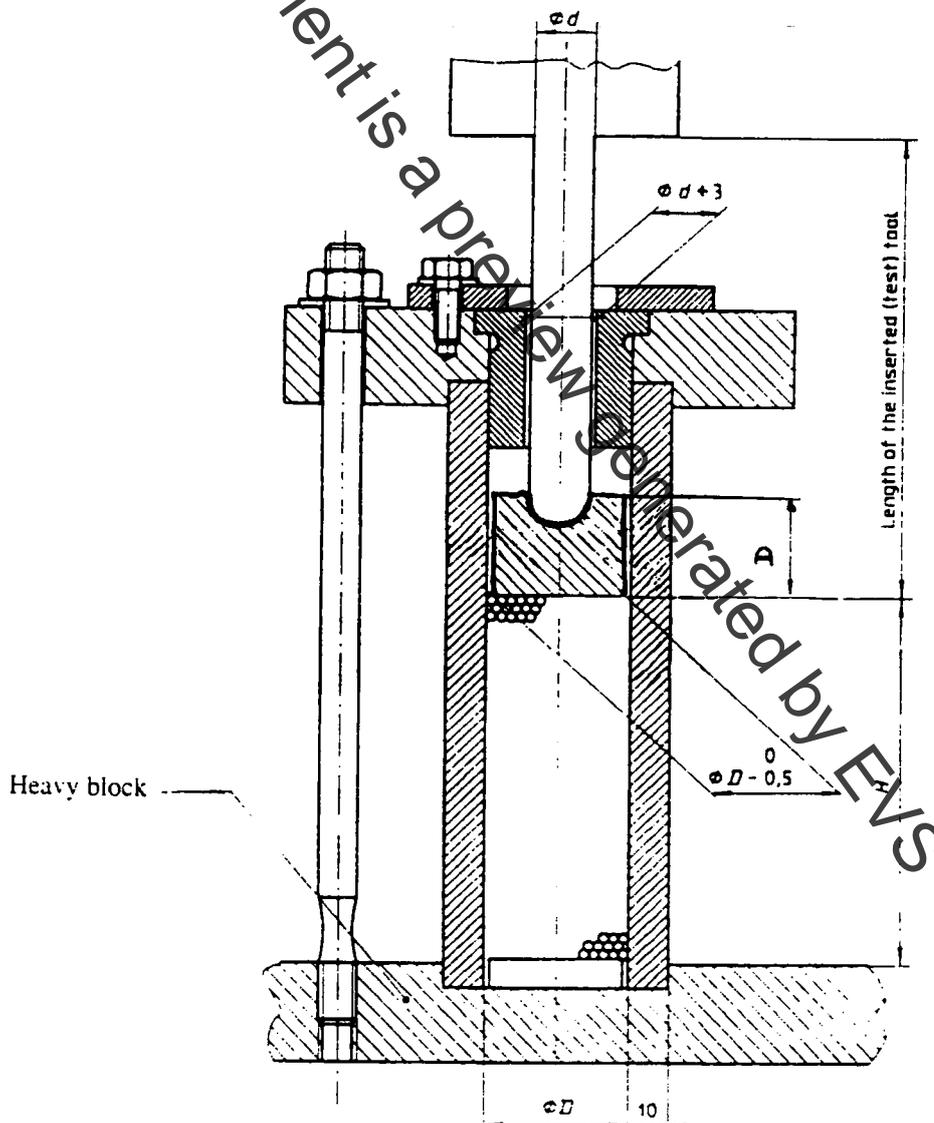


Figure 4 — Steel ball energy absorber

- Delete figure 5 and any reference to that figure.
- Subclause 6.3, replace the 2nd sentence of the 2nd paragraph by the following: *The feed force shall not be greater than 200 N and shall be maintained within a tolerance of $\pm 10\%$ of the chosen value.*
- Subclause 7.2, 2nd paragraph, replace 8 s by 16 s.
- Add a new subclause 7.5 as follows:

7.5 Evaluation of results

The base for declaration is the arithmetic mean of the mean value obtained for each of the three operators.

Annex ZA (normative)

Normative references to international publications with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 8662-1	1988	Hand-held portable power tools – Measurement of vibrations at the handle – Part 1: General	EN 28662-1	1992

Annex ZB (informative)

Bibliography

- ENV 25349 Mechanical vibration – Guidelines for the measurement and the assessment of human exposure to hand-transmitted vibration (ISO 5349:1986)

INTERNATIONAL STANDARD

ISO
8662-5

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

Part 5: Pavement breakers and hammers for construction work

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

Partie 5: Brise-béton, marteaux de démolition et marteaux piqueurs



Reference number
ISO 8662-5:1992(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 8662-5 was prepared by Technical Committee ISO/TC 118, *Compressors, pneumatic tools and pneumatic machines*, Sub-Committee 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 4: *Grinding machines*
- Part 5: *Pavement breakers and hammers for construction work*
- Part 6: *Impact drills*
- Part 7: *Impact wrenches*
- Part 8: *Orbital sanders*

Annex A forms an integral part of this part of ISO 8662. Annexes B and C are for information only.

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Introduction

This part of ISO 8662 specifies how a type test for the measurement of vibrations at the handles of pavement breakers and hammers for construction work shall be performed. It supplements ISO 8662-1 which gives the general specifications for the measurement of vibrations at the handles of hand-held portable power tools. It specifies the operation of the tool under type test and other requirements for the performance of the type test.

The principle of the operation of these power tools is that a driving medium causes a piston to transmit energy periodically to a moil point or other type of tool. The piston also generates a reaction force on the housing of the power tool, which makes it necessary to apply a certain minimum static force on the tool to produce a stationary operating condition.

The reproducibility determined from a great number of tests in which these tools were operated in typical work situations (i.e. breaking concrete) was found to be poor and the possibility of improving it is small. It was therefore concluded that the type test must be carried out using a dummy load, so chosen that the values measured correspond to those found in typical work situations. The reproducibility of the proposed method has been found to be good.

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

Part 5:

Pavement breakers and hammers for construction work

1 Scope

This part of ISO 8662 specifies a laboratory method for measuring the vibrations at the handles of hand-held power driven pavement breakers and hammers for construction work. It is a type test procedure for establishing the magnitude of vibration in the handle of a power tool operating under a specified load.

The power tools covered by this part of ISO 8662 may be electrically, pneumatically or hydraulically driven, or driven by means of an internal combustion engine.

It is intended that the results obtained can be used to compare different power tools or different models of the same power tool. Although the levels measured are obtained in a simulated work operation they give an estimation of the levels 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

The quantities to be measured are as follows:

- the root-mean-square (r.m.s.) acceleration in accordance with ISO 8662-1:1988, subclause 3.1, presented as a weighted acceleration in accordance with ISO 8662-1:1988, subclause 3.3, and as a frequency analysis in accordance with ISO 8662-1:1988, subclause 3.2;

NOTE 1 The frequency analysis may be omitted if the absence of d.c.-shift can be proved by other means.

- the supply voltage, and the air or hydraulic pressure;
- the blow frequency;
- the feed force.

4 Instrumentation

4.1 General

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

4.2 Transducer

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

NOTE 2 For light handles, for example made of plastic, care must be taken not to load the handle with too large