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Irish Standard
I.S. EN ISO 28927-6:2009

Hand-held portable power tools - Test methods for evaluation of vibration emission - Part 6: Rammers (ISO 28927 -6:2009)

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EUROPEAN STANDARD

NORME EUROPÉENNE

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EN ISO 28927-6

December 2009

ICS 13.160; 25.140.10

Supersedes EN ISO 8662-9:1996

English Version

Hand-held portable power tools - Test methods for evaluation of vibration emission - Part 6: Rammers (ISO 28927-6:2009)

Machines à moteur portatives - Méthodes d'essai pour l'évaluation de l'émission de vibrations - Partie 6: Marteaux fouloirs (ISO 28927-6:2009)

Handgehaltene motorbetriebene Maschinen - Messverfahren zur Ermittlung der Schwingungsemission - Teil 6: Stampfer (ISO 28927-6:2009)

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Foreword

This document (EN ISO 28927-6:2009) has been prepared by Technical Committee ISO/TC 118 "Compressors and pneumatic tools, machines and equipment" in collaboration with Technical Committee CEN/TC 231 “Mechanical vibration and shock” the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by June 2010, and conflicting national standards shall be withdrawn at the latest by June 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 8662-9:1996.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directives.

For relationship with EU Directives, see informative Annex ZA and ZB, which are integral parts of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 28927-6:2009 has been approved by CEN as a EN ISO 28927-6:2009 without any modification.

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Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC, amended by Directive 98/79/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 98/37/EC, Machinery, amended by Directive 98/79/EC.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive, except ER 1.7.4 d) and 2.2, and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

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Annex ZB
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide one means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirement of that Directive, except ER 2.2.1.1, and associated EFTA regulations.

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INTERNATIONAL STANDARD

ISO 28927-6

First edition
2009-12-15

Hand-held portable power tools — Test methods for evaluation of vibration emission —

Part 6: Rammers

Machines à moteur portatives — Méthodes d'essai pour l'évaluation de l'émission de vibrations —

Partie 6: Marteaux fouloirs

Reference number
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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 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.

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 28927-6 was prepared by Technical Committee ISO/TC 118, *Compressors and pneumatic tools, machines and equipment*, Subcommittee SC 3, *Pneumatic tools and machines*.

This first edition of ISO 29827-6 cancels and replaces ISO 8662-9:1996, of which it constitutes a technical revision. The most important changes are

— vibration measurement in three axes and at both hand positions,

— new transducer positions, and

— improved definition of transducer positions and orientation.

ISO 28927 consists of the following parts, under the general title *Hand-held portable power tools — Test methods for evaluation of vibration emission*:

— *Part 1: Angle and vertical grinders*[1)]

— *Part 2: Wrenches, nutrunners and screwdrivers*[2)]

— *Part 3: Polishers and rotary, orbital and random orbital sanders*[3)]

— *Part 4: Straight grinders*[4)]

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1) Together with Part 4, replaces ISO 8662-4, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 4: Grinders*.

2) Replaces ISO 8662-7, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 7: Wrenches, screwdrivers nut runners with impact, impulse and ratcheting action.* All screwdrivers and nutrunners except for one-shot tools now covered.

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

4) Together with Part 1, replaces ISO 8662-4, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 4: Grinders*.

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— *Part 5: Drills and impact drills*[5)]

— *Part 6: Rammers*

— *Part 7: Nibblers and shears*[6)]

— *Part 8: Saws, polishing and filing machines with reciprocating action and small saws with oscillating or rotating action*[7)]

— *Part 9: Scaling hammers and needle scalers*[8)]

— *Part 10: Percussive drills, hammers and breakers*[9)]

— *Part 11: Stone hammers*[10)]

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5) Replaces ISO 8662-6, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 6: Impact drills.* Non-impacting drills now covered.

6) Replaces ISO 8662-10, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 10: Nibblers and shears.*

7) Replaces ISO 8662-12, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 12: Saws and files with reciprocating action and saws with oscillating or rotating action.*

8) Together with Part 11, replaces ISO 8662-14, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 14: Stone-working tools and needle scalers.*

9) Replaces 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*, and ISO 8662-5, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 5: Pavement breakers and hammers for construction work.* Chipping and riveting hammers, rock drills and rotary hammers all covered.

10) Together with Part 9, replaces ISO 8662-14, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 14: Stone-working tools and needle scalers.*

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Introduction

This document is a type-C standard as stated in ISO 12100.

When requirements of this type-C standard are different from those which are stated in type-A or -B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

The vibration test codes for portable hand-held machines given in ISO 28927 are based on ISO 20643, which gives general specifications for the measurement of the vibration emission of hand-held and hand-guided machinery. ISO 28927 specifies the operation of the machines under type-test conditions and other requirements for the performance of type tests. The structure/numbering of its clauses follows that of ISO 20643.

The basic principle for transducer positioning first introduced in the EN 60745 series of European standards is followed, representing a deviation from ISO 20643 for reasons of consistency. The transducers are primarily positioned next to the hand in the area between the thumb and the index finger, where they give the least disturbance to the operator gripping the machine.

It has been found that vibrations generated by rammers vary considerably in typical use. For rammers, the percussion action is the source of vibration, and the variation is largely due to variations in the handling of the rammer and the damping characteristics of the material worked on.

In order to provide a method that gives good measurement reproducibility, this part of ISO 28927 uses a working process where the rammer is used on an energy absorber, thereby giving damping characteristics that will be constant over time. The procedures of ISO 5349 are required whenever exposure at the workplace is to be assessed.

The values obtained are type-test values intended to be representative of the average of the upper quartile of typical vibration magnitudes in real-world use of the machines. However, the actual magnitudes will vary considerably from time to time and depend on many factors, including the operator, the task and the inserted tool or consumable. The state of maintenance of the machine itself might also be of importance. Under real working conditions the influences of the operator and process can be particularly important at low magnitudes. It is therefore not recommended that emission values below 2,5 m/s^2 be used for estimating the vibration magnitude under real working conditions. In such cases, 2,5 m/s^2 is the recommended vibration magnitude for estimating the machine vibration.

If accurate values for a specific work place are required, then measurements (according to ISO 5349) in that work situation could be necessary. Vibration values measured in real working conditions can be either higher or lower than the values obtained using this part of ISO 28927.

Higher vibration magnitudes can easily occur in real work situations, caused by an improper combination of butt and rammed material.

The vibration test codes given in ISO 28927 supersede those given in ISO 8662, whose parts have been replaced by the corresponding parts of ISO 28927 (see Foreword).

NOTE ISO 8662-11, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 11: Fastener driving tools*, and ISO 8662-13, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 13: Die grinders*, could be replaced by future parts of ISO 28927.

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Hand-held portable power tools — Test methods for evaluation of vibration emission —

Part 6:
Rammers

1 Scope

This part of ISO 28927 specifies a laboratory method for measuring hand-transmitted vibration emission at the handles of hand-held, power-driven rammers. It is a type-test procedure for establishing the magnitude of vibration in the gripping areas of a machine run under specified test conditions. It is intended that the results be used to compare different models of the same type of machine.

This part of ISO 28927 is applicable to rammers, back-fill rammers, pawing rammers, sand rammers and stampers (see Clause 5), driven pneumatically or by other means, intended for use in foundries, on building sites, etc., and with, for example, butts or peens made of cast iron or rubber, used for ramming of casting sand or in stamping work.

NOTE To avoid confusion with the terms “power tool” and “inserted tool”, *machine* is used for the former throughout this document.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 5349:2001 (all parts), *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration*

ISO 5391:2003, *Pneumatic tools and machines — Vocabulary*

ISO 17066:2007, *Hydraulic tools — Vocabulary*

ISO 20643:2005, *Mechanical vibration — Hand-held and hand-guided machinery — Principles for evaluation of vibration emission*

EN 12096:1997, *Mechanical vibration — Declaration and verification of vibration emission values*

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