ILNAS

Institut luxembourgeois de la normalisation
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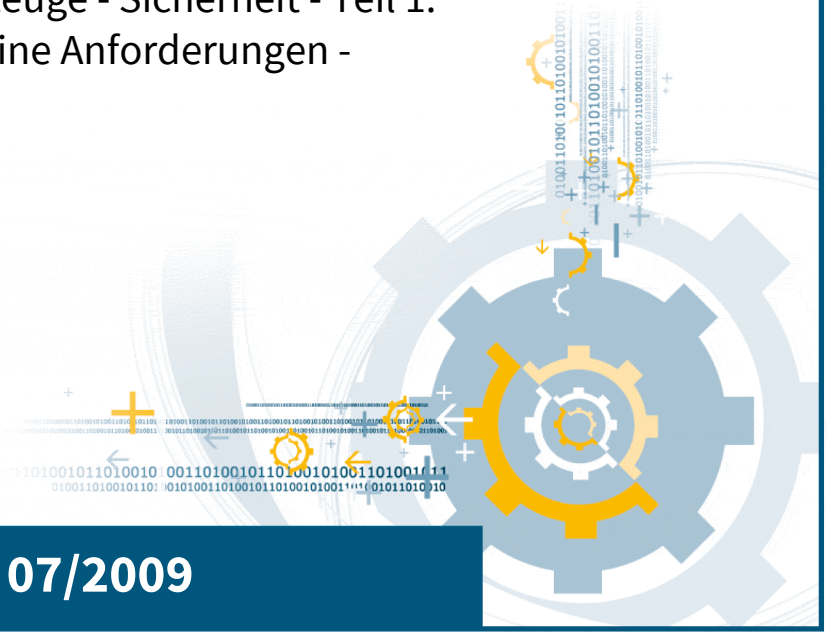
ILNAS-EN 60745-1:2009

Hand-held motor-operated electric tools - Safety - Part 1: General requirements

Outils électroportatifs à moteur - Sécurité - Partie 1: Règles générales

Handgeführte motorbetriebene Elektrowerkzeuge - Sicherheit - Teil 1: Allgemeine Anforderungen -



07/2009

National Foreword

This European Standard EN 60745-1:2009 was adopted as Luxembourgish Standard ILNAS-EN 60745-1:2009.

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- Participate in the design of standards
- Foresee future developments
- Participate in technical committee meetings

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EUROPEAN STANDARD **EN 60745-1**

NORME EUROPÉENNE

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Supersedes EN 60745-1:2006
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English version

Hand-held motor-operated electric tools - Safety - Part 1: General requirements
(IEC 60745-1:2006, modified)

Outils électroportatifs à moteur - Sécurité - Partie 1: Règles générales (CEI 60745-1:2006, modifiée)

Handgeführte motorbetriebene Elektrowerkzeuge - Sicherheit - Teil 1: Allgemeine Anforderungen (IEC 60745-1:2006, modifiziert)

This European Standard was approved by CENELEC on 2009-03-01. CENELEC 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.

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

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC
European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 60745-1:2009 E

Foreword

The text of document 61F/632/FDIS, future edition 4 of IEC 60745-1, prepared by SC 61F, Safety of hand-held motor-operated electric tools, of IEC TC 61, Safety of household and similar electrical appliances, was submitted to the IEC-CENELEC parallel vote.

A draft amendment, prepared by the Technical Committee CENELEC TC 61F, Safety of hand-held and transportable motor-operated electric tools, was submitted to the formal vote.

The combined texts were approved by CENELEC as EN 60745-1 on 2006-06-01.

Two draft amendments (prAB and prAC), prepared by the Technical Committee CENELEC TC 61F (transformed into CENELEC TC 116, Safety of hand-held motor-operated electric tools), were submitted to the Unique Acceptance Procedure.

The text of EN 60745-1:2006 together with that of the draft amendments prAB and prAC were approved by CENELEC as a new edition of EN 60745-1 on 2009-03-01.

This European Standard supersedes EN 60745-1:2006.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2009-12-29
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	-

This European Standard has been prepared under a mandate given to CEN and CENELEC by the European Commission and the European Free Trade Association and supports the essential health and safety requirements of the Machinery Directive 2006/42/EC.

This European Standard is divided into two parts:

Part 1: General requirements which are common to most hand-held electric motor operated tools (for the purpose of this standard referred to simply as tools) which could come within the scope of this standard;

Part 2: Requirements for particular types of tools which either supplement or modify the requirements given in Part 1 to account for the particular hazards and characteristics of these specific tools.

Compliance with the relevant clauses of Part 1 together with a relevant Part 2 of this standard provides one means of conforming with the essential health and safety requirements of the Directive concerned.

A relevant Part 2 is one in which the type of the tool or an accessory which is to be used with the tool is within the scope of that Part 2.

When a relevant Part 2 does not exist, Part 1 can help to establish the requirements for the tool, but will not by itself provide a means of conforming to the relevant essential health and safety requirements of the Machinery Directive.

Other standards referred to in this European Standard are also listed in Annex ZA, which gives the valid edition of those documents at the time of issue of this EN.

CEN Technical Committees have produced a range of standards dealing with a similar range of non-electrically powered tools. Where necessary, normative references are made to these standards in the relevant Part 2.

This European Standard follows the overall requirements of EN ISO 12100-1 and EN ISO 12100-2.

Subclauses, tables and figures which are additional to those in IEC 60745-1 are prefixed “Z”.

NOTE 1 In this standard the following print types are used:
- requirements proper; in roman type
- *test specifications: in italic type;*
- explanatory matter: in smaller roman type.

NOTE 2 In Annexes B, K, L and M, subclauses which are additional to those in the main body of the text are numbered starting from 201.

The contents of the corrigendum of December 2009 have been included in this copy.

Endorsement notice

The text of the International Standard IEC 60745-1:2006 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

1 Scope

Add *to the 6th paragraph:*

- tools intended to be used with cosmetics or pharmaceutical products;

2 Normative references

Add *the following normative references:*

CR 1030-1:1995, *Hand-arm vibration - Guidelines for vibration hazards reduction - Part 1: Engineering methods by design of machinery*

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

EN 27574-4:1988, *Acoustics - Statistical methods for determining and verifying stated noise emission values of machinery and equipment - Part 4: Methods for stated values for batches of machines* (ISO 7574-4:1985)

EN ISO 8041:2005, *Human response to vibration - Measuring instrumentation* (ISO 8041:2005)

EN ISO 3744:1995, *Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering method in an essentially free field over a reflecting plane* (ISO 3744:1994)

EN ISO 4871:1996, *Acoustics - Declaration and verification of noise emission values of machinery and equipment* (ISO 4871:1996)

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

EN 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* (ISO 11203:1995)

EN ISO 11688-1:1998, *Acoustics - Recommended practice for the design of low-noise machinery and equipment - Part 1: Planning* (ISO/TR 11688-1:1995)

EN ISO 11690-3:1998, *Acoustics - Recommended practice for the design of low-noise workplaces containing machinery - Part 3: Sound propagation and noise prediction in workrooms* (ISO/TR 11690-3:1997)

ISO 5347 (all parts), *Methods for the calibration of vibration and shock pick-ups*

ISO 16063-1:1998, *Methods for the calibration of vibration and shock transducers - Part 1: Basic concepts*

***Replace** the existing Clause 6 - Void, by the following:*

6 Environmental requirements

6.1 Noise

6.1.1 Noise reduction

Noise reduction at tools is an integral part of the design process and shall be achieved by particularly applying measures at source to control noise, see for example EN ISO 11688-1. The success of the applied noise reduction measures is assessed on the basis of the actual noise emission values in relation to other machines of the same type with comparable non acoustical technical data.

The major sound sources of tools are: motor, fan, gear.

6.1.2 Noise test code (grade 2)

6.1.2.1 General

Noise emission values like the emission sound pressure level L_{pA} and the sound power level L_{WA} to be quoted in the user instructions as required by 8.12.2 Za)1) shall be measured according to the test procedure described in 6.1.2.1 to 6.1.2.6.

The noise emission may be determined by using the measurements from a machine which has design and technical specifications replicating the machine concerned.

The overall noise can be divided into the pure machine noise and the noise of processing the workpiece. Both are influenced by the method of operation, however for percussive tools the noise emission of the workpiece can be dominant. The load conditions for particular tools are therefore specified in the relevant Part 2.

Noise emission values obtained under these measurement conditions will not necessarily correspond to the noise levels produced under the operational conditions of practical use.

NOTE It is not possible to simulate all conditions of practical use. A statement of process noise could therefore
- be misleading and cause faulty assessment of the risk in individual cases,
- discourage the development of more silent machines,
- lead to low repeatability of measurements and thus cause problems when verifying declared noise values,
- make the comparison of the noise emission from different tools difficult.

6.1.2.2 Sound power level determination

The sound power level shall be measured according to EN ISO 3744, where the acoustic environment, instrumentation, quantities to be measured, quantities to be determined, and the measurement procedure are specified.

The sound power level shall be given as A-weighted sound power level in dB reference 1 pW. The A-weighted sound pressure levels, from which the sound power is to be determined, shall be measured directly, and not calculated from frequency band data. Measurements shall be made in an essentially free field over a reflecting plane.

For all hand-held electric power tools, the sound power level shall be determined by using a hemispherical / cylindrical measurement surface according to Figure Z2.

The hemispherical / cylindrical measurement surface is described by a hemisphere standing on a cylindrical pedestal (see Figure Z2). Five microphone positions shall be located 1 m from the geometric centre of the power tool. Four positions shall be spaced at regular intervals on a plane defined as passing through the geometric centre of the power tool and parallel to the reflecting plane; the fifth position shall be located at a distance of 1 m above geometric centre of the power tool.

The A-weighted sound power level, L_{WA}, shall be calculated, in accordance with Subclause 8.6 of EN ISO 3744 as follows:

$$L_{WA} = \overline{L_{pfA}} + 10\lg\left(\frac{S}{S_0}\right), \text{ in dB} \qquad (Z1)$$

with $\overline{L_{pfA}}$ determined from

$$\overline{L_{pfA}} = 10\lg\left[\frac{1}{5}\sum_{i=1}^{5} 10^{0,1L'_{pA,i}}\right] - K_{1A} - K_{2A}$$

where

$\overline{L_{pfA}}$ A-weighted surface sound pressure level according to EN ISO 3744

$L'_{pA,i}$ A-weighted sound pressure level measured at the i^{th} microphone position, in dB

K_{1A} background noise correction, A-weighted

K_{2A} environmental correction, A-weighted

S area of the measurement surface, in m^2

S_0 = 1 m^2

For the hemispherical / cylindrical measurement surface shown in Figure Z2, the area S of the measurement surface is calculated as follows:

$$S = 2\pi(R^2 + Rd), \text{ in } m^2. \qquad (Z2)$$

where

d = 1 m is the height of the distance of the geometrical centre of the power tool above the reflecting plane

and

R = 1 m is the radius of the hemisphere and of the cylinder which comprise the measurement surface.

Therefore,

$$S = 4\pi\ m^2,$$

so, from equation (Z1)

$$L_{WA} = \overline{L_{pfA}} + 11, \text{ in dB.} \qquad (Z3)$$

6.1.2.3 Emission sound pressure level determination

The A-weighted emission sound pressure level at the work station, L_{pA}, shall be determined in accordance with EN ISO 11203 as follows:

$$L_{pA} = L_{WA} - Q \text{, in dB} \quad \text{(Z4)}$$

where

Q = 11, in dB

NOTE 1 This value of Q has been determined, during experimental investigations, to be applicable to hand-held power tools. The resulting A-weighted emission sound pressure level at the workstation is equivalent to the value of the surface sound pressure level at a distance of 1 m from the power tool. This distance has been chosen to give satisfactory reproducibility of results, and to permit comparison of the acoustic performance of different hand-held power tools which do not, in general, have uniquely defined work stations. Under free field conditions, where it may be required to estimate the emission sound pressure level, L_{pA1}, at a distance r_1 in m from the geometric centre of the power tool, this may be done by applying the formula:

$$L_{pA1} = L_{pA} + 20 \lg\left(\frac{1}{r_1}\right) \text{, in dB}$$

NOTE 2 At any given position in relation to a particular machine, and for given mounting and operating conditions, the emission sound pressure levels determined by the method of this European Standard will in general be lower than the directly measured sound pressure levels for the same machine in the typical workroom where it is used. This is due to the influence of sound reflecting surfaces in the workroom compared to the free field conditions of the test specified here. A method of calculating the sound pressure levels in the vicinity of a machine operating alone in a workroom is given in EN ISO 11690-3. Commonly observed differences are 1 dB to 5 dB, but in extreme cases the difference may be even greater.

If required, the C-weighted peak emission sound pressure level L_{pCpeak} shall be measured at each of the five measurement positions specified in 6.1.2.2. The C-weighted peak emission sound pressure level at the work station is the highest C-weighted peak sound pressure level measured at any of the five microphone positions; no corrections are permitted.

6.1.2.4 Installation and mounting conditions of the power tools during noise tests

The installation and mounting conditions shall be the same for the determination of both sound power level and emission sound pressure level at the work station.

The power tool under test shall be new and equipped with accessories which affect the acoustic properties, as recommended by the manufacturer. Prior to commencing testing, the power tool (including any required ancillary equipment) shall be set up in a stable condition in accordance with the manufacturer's instructions for safe use.

The tool is held by the operator or suspended in such a way as to correspond to normal use, as specified in the relevant Part 2.

If the power tool is used horizontally, it shall be positioned so that its axis is at 45° between the microphone positions 1 – 4 and 2 – 3; its geometrical centre shall be 1 m above the ground (reflecting plane). If these requirements are impracticable or the tool is not used horizontally, the adopted positions shall be recorded and described in the test report.

The operator shall not be positioned directly between any microphone position and the power tool.

6.1.2.5 Operating conditions

The operating conditions shall be identical for the determination of both sound power level and emission sound pressure level at the work station.

Measurements shall be carried out on a new tool.