SLOVENSKI STANDARD

SIST EN 60900:2004

september 2004

Delo pod napetostjo – Ročna orodja za uporabo pri izmeničnih napetostih do največ 1000 V in enosmernih napetostih do 1500 V

Live working - Hand tools for use up to 1 000 V a.c. and 1 500 V d.c.

ICS 13.260

Referenčna številka
SIST EN 60900:2004(en)

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60900

May 2004

ICS 29.260.99; 13.260; 29.240.20

Supersedes EN 60900:1993 + A1:1995 + A11:1997 + A2:2002

English version

Live working – Hand tools for use up to 1 000 V a.c. and 1 500 V d.c. (IEC 60900:2004)

Travaux sous tension –
Outils à main pour usage jusqu'à 1 000 V en courant alternatif et 1 500 V en courant continu
(CEI 60900:2004)

Arbeiten unter Spannung -
Handwerkzeuge zum Gebrauch bis AC 1 000 V und DC 1 500 V
(IEC 60900:2004)

This European Standard was approved by CENELEC on 2004-03-16. 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 60900:2004 E

Foreword

The text of document 78/547/FDIS, future edition 2 of IEC 60900, prepared by IEC TC 78, Live working, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60900 on 2004-03-16.

This European Standard supersedes EN 60900:1993 + A1:1995 + A11:1997 + A2:2002.

This new EN 60900

– adds requirements concerning interchangeable tools, where the used components are from different manufacturers;

– adds requirements and test values concerning insulating tools;

– includes bit-screwdrivers;

– includes screwdrivers with screw retaining devices;

– enlarges conditioning and test possibilities of the dielectric test;

– clarifies questions concerning quality assurance and

– includes the number of the standard with the year of publication (four digits) into the marking requirements.

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) 2005-01-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2007-04-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60900:2004 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60743	NOTE	Harmonized as EN 60743:2001 (not modified).
ISO 9001	NOTE	Harmonized as EN ISO 9001:2001 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE Where an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60060-1 + corr. March	1989 1990	High-voltage test techniques Part 1: General definitions and test requirements	HD 588.1 S1	1991
IEC 60212	1971	Standard conditions for use prior to and during the testing of solid electrical insulating materials	HD 437 S1	1984
IEC 60417	database	Graphical symbols for use on equipment	-	-
IEC 61318	2003	Live working - Quality assurance plans applicable to tools, devices and equipment	-	-
IEC 61477	2001	Live working - Minimum requirements for the utilization of tools, devices and equipment	EN 61477	2002
A1	2002		A1	2002
ISO 1174-1	1996	Assembly tools for screw and nuts - Driving squares Part 1: Driving squares for hand socket tools	-	-
ISO 9654	1989	Pliers and nippers for electronics - Single-purpose nippers - Cutting nippers	-	-
ISO 9655	1989	Pliers and nippers for electronics - Single-purpose nippers - Pliers for gripping and manipulating	-	-
ISO 9656	1989	Pliers and nippers for electronics - Test methods	-	-
ISO 9657	1989	Pliers and nippers for electronics - General technical requirements	-	-

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60900

Deuxième édition
Second edition
2004-01

Travaux sous tension – Outils à main pour usage jusqu'à 1 000 V en courant alternatif et 1 500 V en courant continu

Live working – Hand tools for use up to 1 000 V a.c. and 1 500 V d.c.

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LIVE WORKING – HAND TOOLS FOR USE UP TO 1 000 V AC AND 1 500 V DC

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60900 has been prepared by IEC technical committee 78: Live working. This second edition

– cancels and replaces the first edition, published in 1987, and its two amendments published in 1995 and in 2002;
– adds requirements concerning interchangeable tools, where the used components are from different manufacturers;
– adds requirements and test values concerning insulating tools;
– includes bit-screwdrivers;
– includes screwdrivers with screw retaining devices;
– enlarges conditioning and test possibilities of the dielectric test;
– clarifies questions concerning quality assurance and
– includes the number of the standard with the year of publication (four digits) into the marking requirements.

The text of this standard is based on the following documents:

FDIS	Report on voting
78/547/FDIS	78/554/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

INTRODUCTION

This International Standard has been prepared in accordance with the requirements of IEC 61477 where applicable.

LIVE WORKING – HAND TOOLS FOR USE UP TO 1 000 V AC AND 1 500 V DC

1 Scope

This International Standard is applicable to insulated and insulating hand tools used for working live or close to live parts at nominal voltages up to 1 000 V a.c. and 1 500 V d.c.

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.

IEC 60060-1:1989, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60212:1971, *Standard conditions for use prior to and during the testing of solid electrical insulating materials*

IEC 60417-DB:2002[1], *Graphical symbol for use on equipment*

IEC 61318:2003 *Live working – Quality assurance plans applicable to tools, devices and equipments*

IEC 61477:2001, *Live working – Minimum requirements for the utilization of tools, devices and equipment*
Amendment 1 (2002)[2]

ISO 1174-1:1996, *Assembly tools for screw and nuts – Driving squares – Part 1: Driving squares for hand socket tools*

ISO 9654:1989, *Pliers and nippers for electronics – Single-purpose nippers – Cutting nippers*

ISO 9655:1989, *Pliers and nippers for electronics – Single-purpose nippers – Pliers for gripping and manipulating*

ISO 9656:1989, *Pliers and nippers for electronics – Test methods*

ISO 9657:1989, *Pliers and nippers for electronics – General technical requirements*

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[1] "DB" refers to the IEC on-line database.

[2] There exists a consolidated edition 1.1 (2002) that includes edition 1 and its amendment.

3 Terms and definitions

For the purpose of this document, the following terms and definitions and those of IEC 61318 apply.

NOTE For the definitions of general terms in this document, reference should be made to IEC 60050 or to special definitions laid down in IEC 60743. Nomenclature of hand tools are found in the relevant ISO standards such as ISO 1703, ISO 5742 and ISO 8979.

3.1
hand tool (in live working)
insulated or insulating tool designed to be used with the insulating glove working method at low voltage

NOTE These tools are generally ordinary tools such as screwdrivers, pliers, wrenches or knives.

[IEV 651-01-27]

3.2
insulated hand tool
hand tool made of conductive materials, fully or partially covered by insulating materials

[Definition 2.3.1 of IEC 60743 and IEV 651-01-25, modified]

3.3
insulating hand tool
hand tool made totally or essentially from insulating materials except for inserts made from conductive materials used for reinforcement, but with no exposed conductive parts

[Definition 2.3.2 of IEC 60743 and IEV 651-01-26, modified]

4 Requirements

4.1 General requirements

4.1.1 Safety

Insulated hand tools shall be manufactured and dimensioned in such a way that they protect the user from electric shock and, when fully covered by insulating materials and used in the correct manner, minimize the risk of short-circuits between two parts at different potentials.

Insulating hand tools shall be manufactured and dimensioned in such a way that they protect the user from electric shock and they avoid short-circuits between two parts at different potentials when used in the correct manner.

4.1.2 Performance under load

The mechanical specifications for insulated hand tools shall comply with the corresponding ISO Standards, or, where no ISO standard exists, with a standard specified by the manufacturer or the customer, (for example a national standard). The mechanical specifications for the working parts of the tools shall be retained even after application of an insulating layer.

Insulating tools specially designed for live working may have lower stress resistance than insulated tools, but they shall withstand the expected work loads without failing due to remaining deformation or breaking. These tools can be equipped with devices, that limit the workloads that can be applied with them, for example by overload slipping clutches (see also Annex A).

4.1.3 Double-ended tools

Double-ended tools, such as box wrenches, keys for hexagonal socket screws, double-ended socket-wrenches, double-head open-end wrenches, etc., are not allowed for insulated tools but are allowed for insulating tools.

4.1.4 Marking

All markings shall be clearly identifiable by persons with normal or corrected sight without further magnification. Each tool and/or tool component shall be legibly and permanently marked with the following inscriptions:

- on the insulating material layer or on the metal part:
  - marking of the origin (manufacturer's name or trade mark);
- on the insulating material layer:
  - model/type reference;
  - year of manufacture (at least the last two digits of the year);
  - symbol IEC-60417-5216 (DB:2002-10) – Suitable for live working; double triangle, with indication 1 000 V (i.e. the electrical working limit for alternating current). The symbol shall be at least 3 mm high; the letter and the figures shall be at least 2 mm (see Figure 1);

  NOTE For the symbol, the exact ratio of the height of the figure to the base of the triangle is 1,43. For the purpose of convenience, this ratio can be between the values of 1,4 and 1,5.

  - number of the relevant IEC standard immediately adjacent to the symbol with year of publication (four digits), (IEC 60900:2004). Where there is a lack of space on the product itself, it is permissible to limit this marking to the number of the standard. In such a case, the complete marking including the year of publication shall appear with the smallest packaging for shipping;

  - for tools designed for use at extremely low temperature: letter “C” (see 4.2.2);
  - additional marking for tools capable of being assembled and designed to be interchangeable between different manufacturers (see Figure 2);
  - additional marking where specified by the customer (for example ownership mark).

The tools shall bear no voltage marking apart from those described above.

NOTE For example, the indication of test voltage may lead to the assumption that the tool is suitable for work at that voltage.

4.1.5 Separating of covers

If tools have conductive elements (for example: torque adjusting screws, operating direction switches, etc.) which are insulated with covers of insulating materials, these covers shall be well fastened, so that they don't come off during normal use (see 5.7.5).

4.1.6 Instructions for use

In the case of tools which require assembly or adjustment, the proper method shall be stated in the instructions for use, in accordance with the general provisions given in IEC 61477.

NOTE Other instructions, such as verification before use and test methods, should be given by the manufacturer or the user (see Annex B).