



NSAI
Standards

Irish Standard
I.S. EN 60900:2012

Live working - Hand tools for use up to
1000 V a.c. and 1500 V d.c. (IEC
60900:2012 (EQV))

I.S. EN 60900:2012

Incorporating amendments/corrigenda issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

<i>This document replaces:</i> EN 60900:2004	<i>This document is based on:</i> EN 60900:2012 EN 60900:2004	<i>Published:</i> 24 August, 2012 13 May, 2004
This document was published under the authority of the NSAI and comes into effect on: 11 September, 2012		ICS number: 13.260 29.240.20 29.260.99
NSAI 1 Swift Square, Northwood, Santry Dublin 9	T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie W NSAI.ie	Sales: T +353 1 857 6730 F +353 1 857 6729 W standards.ie
Údarás um Chaighdeáin Náisiúnta na hÉireann		

I.S. EN 60900:2012

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60900

August 2012

ICS 13.260; 29.240.20; 29.260.99

Supersedes EN 60900:2004

English version

Live working -
Hand tools for use up to 1000 V a.c. and 1500 V d.c.
(IEC 60900:2012)

Travaux sous tension -
Outils à main pour usage jusqu'à 1000 V
en courant alternatif et 1500 V en courant
continu
(CEI 60900:2012)

Arbeiten unter Spannung -
Handwerkzeuge zum Gebrauch bis AC
1000 V und DC 1500 V
(IEC 60900:2012)

This European Standard was approved by CENELEC on 2012-07-19. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

I.S. EN 60900:2012

EN 60900:2012

- 2 -

Foreword

The text of document 78/947/FDIS, future edition 3 of IEC 60900, prepared by IEC/TC 78 "Live working" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60900:2012.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-04-19
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-07-19

This document supersedes EN 60900:2004.

EN 60900:2012 includes the following significant technical changes with respect to EN 60900:2004:

- general review of the requirements and test provisions;
- preparation of the elements of evaluation of defects, and general application of EN 61318:2008;
- deletion of Annexes D and E, not applicable according to EN 61318;
- introduction of a new normative Annex D on chronology of type tests;
- introduction of a new normative Annex F on classification of defects.

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

Endorsement notice

The text of the International Standard IEC 60900:2012 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60743 NOTE Harmonized as EN 60743.

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

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

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60060-1	-	High-voltage test techniques - Part 1: General definitions and test requirements	EN 60060-1	-
IEC 60212	-	Standard conditions for use prior to and during the testing of solid electrical insulating materials	EN 60212	-
IEC 61318	-	Live working - Conformity assessment applicable to tools, devices and equipment	EN 61318	-
IEC 61477	-	Live working - Minimum requirements for the utilization of tools, devices and equipment	EN 61477	-
IEC 60417	Data base	Graphical symbols for use on equipment	-	-
ISO 1174-1	-	Assembly tools for screw and nuts - Driving squares - Part 1: Driving squares for hand socket tools	-	-
ISO 9654	-	Pliers and nippers for electronics - Single- purpose nippers - Cutting nippers	-	-
ISO 9655	-	Pliers and nippers for electronics - Single- purpose nippers - Pliers for gripping and manipulating	-	-
ISO 9656	-	Pliers and nippers for electronics - Test methods	-	-
ISO 9657	-	Pliers and nippers for electronics - General technical requirements	-	-

This page is intentionally left BLANK.

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	8
4 Requirements	9
4.1 General requirements.....	9
4.1.1 Safety.....	9
4.1.2 Performance under load	9
4.1.3 Multiple-ended hand tools.....	10
4.1.4 Marking	10
4.1.5 Separating of covers.....	11
4.1.6 Instructions for correct adjustment and assembly	11
4.2 Requirements concerning insulating materials	11
4.2.1 General	11
4.2.2 Thermal stability	11
4.3 Additional requirements.....	11
4.3.1 Hand tools capable of being assembled.....	11
4.3.2 Screwdrivers	14
4.3.3 Wrenches – uninsulated areas.....	15
4.3.4 Adjustable wrenches.....	15
4.3.5 Pliers, strippers, cable scissors, cable-cutting hand tools	16
4.3.6 Scissors	19
4.3.7 Knives	20
4.3.8 Tweezers.....	21
5 Tests	22
5.1 General.....	22
5.2 Visual check.....	23
5.3 Dimensional check	23
5.4 Impact tests.....	23
5.4.1 Type test	23
5.4.2 Alternative means in case of insulated and insulating hand tools having completed the production phase	26
5.5 Dielectric tests	26
5.5.1 General requirements	26
5.5.2 Conditioning (for type test only)	26
5.5.3 Dielectric testing of insulated hand tools.....	27
5.5.4 Dielectric testing of insulating hand tools.....	30
5.6 Indentation test (for insulated hand tools).....	31
5.6.1 Type test	31
5.6.2 Alternative means in case of insulated hand tools having completed the production phase	32
5.7 Test for adhesion of the insulating material coating (for insulated hand tools)	32
5.7.1 Conditioning	32

5.7.2	Type test	33
5.7.3	Alternative means in case of insulated hand tools having completed the production phase	38
5.7.4	Test of adhesion of insulating covers of conductive adjusting or switching elements	39
5.8	Mechanical tests	39
5.8.1	Insulated hand tools	39
5.8.2	Insulating hand tools	40
5.8.3	Tweezers.....	40
5.8.4	Retaining force test	40
5.9	Durability of marking	42
5.10	Flame retardancy test.....	42
5.10.1	Type test	42
5.10.2	Alternative means in case of hand tools having completed the production phase	43
6	Conformity assessment of hand tools having completed the production phase	44
7	Modifications	44
Annex A (informative)	Mechanical strength of insulating hand tools	45
Annex B (normative)	Suitable for live working; double triangle (IEC 60417-5216:2002-10).....	47
Annex C (informative)	Recommendation for use and in-service care	48
Annex D (normative)	General type test procedure.....	49
Annex E (normative)	Examples of calculation of the unwinded length of coating and acceptable leakage current	50
Annex F (normative)	Classification of defects and tests to be allocated	51
Bibliography.....		52
Figure 1	– Marking of the electrical working limit adjacent to the symbol double triangle	10
Figure 2	– Description of the insulating overlapping element and different assembly configurations for hand tools capable of being assembled with square drives	12
Figure 3	– Marking symbol for hand tools capable of being assembled and designed to be interchangeable between different manufacturers	13
Figure 4	– Illustration of insulation of typical hand tools	14
Figure 5	– Insulated adjustable wrench	16
Figure 6	– Insulation of pliers.....	17
Figure 7	– Insulation of multiple slip joint pliers.....	17
Figure 8	– Insulation of pliers with a functional area below the joint	18
Figure 9	– Illustration of insulation of pliers and nippers for electronics.....	19
Figure 10	– Insulation of scissors.....	20
Figure 11	– Insulation of knives	21
Figure 12	– Example of insulation of the handles of tweezers	22
Figure 13	– Example of test arrangement for the impact test – Method A	24
Figure 14	– Example of test arrangement for the impact test – Method B	25
Figure 15	– Dielectric testing arrangement for insulated hand tools	28
Figure 16	– Description of dummies for dielectric tests for hand tools capable of being assembled with square drives	29
Figure 17	– Dielectric testing arrangement for insulating hand tools.....	30

Figure 18 – Indentation test	32
Figure 19 – Principle of the testing device for checking adhesion of the insulating coating on conductive parts of the insulated hand tools – Test on the working head – Method A	34
Figure 20 – Principle of the testing device for checking adhesion of the insulating coating on conductive parts of the insulated hand tools – Test on the working head – Method B	35
Figure 21 – Testing device for checking adhesion of the insulating coating of screwdrivers on conductive parts and the handle	36
Figure 22 – Example of mountings for checking stability of adhesion of the insulation of the entire hand tool.....	38
Figure 23 – Dummies for testing locking systems used with square drives nominal size 12,5 mm of ISO 1174	41
Figure 24 – Dummies for testing locking systems used with square drives nominal size 10 mm of ISO 1174	41
Figure 25 – Example of a flame retardancy test arrangement.....	43
Table 1 – Dimensions and tolerances of the insulating overlapping element	13
Table 2 – Dimensions and tolerances for dummies to be used for dielectric tests	29
Table A.1 – Torque values for insulating screwdrivers	45
Table D.1 – Sequential order for performing type tests ^a	49
Table F.1 – Classification of defects and associated requirements and tests	51

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60900 has been prepared by IEC technical committee 78: Live working.

This third edition cancels and replaces the second edition, published in 2004. This edition constitutes a technical revision.

It includes the following significant technical changes with regard to the previous edition:

- general review of the requirements and test provisions;
- preparation of the elements of evaluation of defects, and general application of IEC 61318:2007 (Ed.3);
- deletion of Annexes D and E, not applicable according to IEC 61318 Ed.3;
- introduction of a new normative Annex D on chronology of type tests;
- introduction of a new normative Annex F on classification of defects.

I.S. EN 60900:2012

– 6 –

60900 © IEC:2012

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

FDIS	Report on voting
78/947/FDIS	78/953/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 the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

I.S. EN 60900:2012

60900 © IEC:2012

– 7 –

INTRODUCTION

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

The product covered by this standard may have an impact on the environment during some or all stages of its life cycle. These impacts can range from slight to significant, be of short-term or long-term, and occur at the global, regional or local level.

This standard does not include requirements and test provisions for the manufacturers of the product, or recommendations to the users of the product for environmental improvement. However, all parties intervening in its design, manufacture, packaging, distribution, use, maintenance, repair, reuse, recovery and disposal are invited to take account of environmental considerations.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-