



NSAI
Standards

Irish Standard
I.S. EN 60974-1:2012

Arc welding equipment -- Part 1: Welding power sources (IEC 60974 -1:2012 (EQV))

I.S. EN 60974-1:2012

Incorporating amendments/corrigenda issued since publication:

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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
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Arc welding equipment -
Part 1: Welding power sources
(IEC 60974-1:2012)

Matériel de soudage à l'arc -
Partie 1: Sources de courant de soudage
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Lichtbogenschweißeinrichtungen -
Teil 1: Schweißstromquellen
(IEC 60974-1:2012)

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 26/472/FDIS, future edition 4 of IEC 60974-1, prepared by IEC/TC 26, "Electric welding" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60974-1:2012.

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) 2013-04-17
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-07-17

This document supersedes EN 60974-1:2005.

EN 60974-1:2012 includes the following significant technical changes with respect to EN 60974-1:2005:

- the heating test shall be carried out at ambient temperature of 40 °C (see 5.1);
- new Figure 1 summarizes example of insulation requirements;
- creepage distances for pollution degree 4 are no longer valid (see Table 2);
- insulation requirements for Class II equipment are defined (see Table 3);
- dielectric test voltage interpolation restriction lower limit is changed to 220 V and interpolation for control and welding circuit is clarified (see Table 4);
- water test is clarified by suppression of visual inspection (see 6.2.1);
- isolation requirements of the supply circuit and the welding circuit are moved in protection against electric shock in normal service (see 6.2.4);
- touch current in normal service and in single fault condition requirements are changed (see 6.2.5, 6.2.6 and 6.3.6);
- maximum temperature for insulation systems are reviewed in accordance with current edition of EN 60085 (see Table 6);
- limits of temperature rise for external surfaces are updated depending of unintentional contact period as defined in EN ISO 13732-1 (see Table 7);
- loading test is completed by a dielectric test (see 7.4);
- conformity test for tolerance to supply voltage fluctuation is clarified (see 10.1);
- marking of terminals is limited to external protective conductor and three-phase equipment terminals (see 10.4);
- usage of hazard reducing device is clarified (see 11.1);
- requirements for control circuits are changed (see Clause 12);
- impact test is clarified (see 14.2.2);
- environmental parameters are completed (see Annex M).

In this standard, the following print types are used:

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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.

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC)

Endorsement notice

The text of the International Standard IEC 60974-1:2012 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 60038:2009	NOTE	Harmonized as EN 60038:2011 (modified).
IEC 60085	NOTE	Harmonized as EN 60085.
IEC 60204-1	NOTE	Harmonized as EN 60204-1.
IEC 60309-1	NOTE	Harmonized as EN 60309-1.
IEC 60950-1	NOTE	Harmonized as EN 60950-1.
IEC 60974-6	NOTE	Harmonized as EN 60974-6.
IEC 60974-10	NOTE	Harmonized as EN 60974-10.
IEC 60974-12	NOTE	Harmonized as EN 60974-12.
IEC 61558-1	NOTE	Harmonized as EN 61558-1.
IEC 62079	NOTE	Harmonized as EN 62079.
ISO 13732-1	NOTE	Harmonized as EN ISO 13732-1

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 60050-151	2001	International Electrotechnical Vocabulary (IEV) - Part 151: Electrical and magnetic devices	-	-
IEC 60050-851	2008	International Electrotechnical Vocabulary - Part 851: Electric welding	-	-
IEC 60245-6	-	Rubber insulated cables - Rated voltages up to and including 450/750 V - Part 6: Arc welding electrode cables	-	-
IEC 60417	Data-base	Graphical symbols for use on equipment	-	-
IEC 60445	-	Basic and safety principles for man-machine interface, marking and identification - Identification of equipment terminals, conductor terminations and conductors	EN 60445	-
IEC 60529	-	Degrees of protection provided by enclosures - (IP Code)	-	-
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60664-3	-	Insulation coordination for equipment within low-voltage systems - Part 3: Use of coating, potting or moulding for protection against pollution	EN 60664-3	-
IEC 60695-11-10	-	Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods	EN 60695-11-10	-
IEC 60974-7	-	Arc welding equipment - Part 7: Torches	EN 60974-7	-
IEC 61140	-	Protection against electric shock - Common aspects for installation and equipment	EN 61140	-
IEC 61558-2-4	-	Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V - Part 2-4: Particular requirements and tests for isolating transformers and power supply units incorporating isolating transformers	EN 61558-2-4	-

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<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61558-2-6	-	Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V - Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers	EN 61558-2-6	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ARC WELDING EQUIPMENT –

Part 1: Welding power sources

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 60974-1 has been prepared by IEC technical committee 26: Electric welding.

This fourth edition cancels and replaces the third edition published in 2005 and constitutes a technical revision.

The significant changes with respect to the previous edition are the following:

- the heating test shall be carried out at ambient temperature of 40 °C (see 5.1);
- new Figure 1 summarizes example of insulation requirements;
- creepage distances for pollution degree 4 are no longer valid (see Table 2);
- insulation requirements for Class II equipment are defined (see Table 3);
- dielectric test voltage interpolation restriction lower limit is changed to 220 V and interpolation for control and welding circuit is clarified (see Table 4);
- water test is clarified by suppression of visual inspection (see 6.2.1);

- isolation requirements of the supply circuit and the welding circuit are moved in protection against electric shock in normal service (see 6.2.4);
- touch current in normal service and in single fault condition requirements are changed (see 6.2.5, 6.2.6 and 6.3.6);
- maximum temperature for insulation systems are reviewed in accordance with current edition of IEC 60085 (see Table 6);
- limits of temperature rise for external surfaces are updated depending of unintentional contact period as defined in ISO 13732-1 (see Table 7);
- loading test is completed by a dielectric test (see 7.4);
- conformity test for tolerance to supply voltage fluctuation is clarified (see 10.1);
- marking of terminals is limited to external protective conductor and three-phase equipment terminals (see 10.4);
- usage of hazard reducing device is clarified (see 11.1);
- requirements for control circuits are changed (see Clause 12);
- impact test is clarified (see 14.2.2);
- environmental parameters are completed (see Annex M).

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

FDIS	Report on voting
26/472/FDIS	26/479/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.

In this standard, the following print types are used:

- *conformity statements*: in italic type.

A list of all parts of the IEC 60974 series can be found, under the general title *Arc welding equipment*, on the IEC website.

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.

ARC WELDING EQUIPMENT –

Part 1: Welding power sources

1 Scope

This part of IEC 60974 is applicable to power sources for arc welding and allied processes designed for industrial and professional use, and supplied by a voltage not exceeding 1 000 V, or driven by mechanical means.

This part of IEC 60974 specifies safety and performance requirements of welding power sources and plasma cutting systems.

This part of IEC 60974 is not applicable to welding power sources for manual metal arc welding with limited duty operation which are designed mainly for use by laymen and designed in accordance with IEC 60974-6.

This part of IEC 60974 is not applicable to testing of power sources during periodic maintenance or after repair.

NOTE 1 Typical allied processes are electric arc cutting and arc spraying.

NOTE 2 AC systems having a nominal voltage between 100 V and 1 000 V are given in Table 1 of IEC 60038:2009.

NOTE 3 This part of IEC 60974 does not include electromagnetic compatibility (EMC) requirements.

2 Normative references

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.

IEC 60050-151:2001, *International Electrotechnical Vocabulary (IEV) – Part 151: Electrical and magnetic devices*

IEC 60050-851:2008, *International Electrotechnical Vocabulary (IEV) – Part 851: Electric welding*

IEC 60245-6, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 6: Arc welding electrode cables*

IEC 60417-DB:2011¹, *Graphical symbols for use on equipment*

IEC 60445, *Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

¹ “DB” refers to the IEC on-line database.

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