



ANSI/IEC 60974-1: 2008

**American National Standard
for Arc Welding Equipment**

Part 1: Welding Power Sources

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*Arc Welding Equipment—
Part 1: Welding Power Sources*

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FOREWORD FOR U.S. ADOPTION

This American National Standard is an adoption of IEC 60974-1 edition 3, *Arc Welding Equipment – Part 1: Welding power sources*, and was developed and approved in accordance with procedures set forth by the American National Standards Institute. It is envisioned that this document will ultimately supersede ANSI/UL 60974-1, which was an adoption of IEC 60974-1, edition 2 and its amendment 1.

This standard contains all the original text as-is from IEC 60974-1, edition 3, in addition to a number of U.S. Differences to the IEC standard that were identified by Accredited Standards Committee W1, *Requirements for Apparatus Designed for Use in Arc Welding, Plasma Arc Cutting, and Allied Processes*. Each U.S. Difference is found both in a compilation of U.S. differences following this foreword, and inserted in the appropriate place(s) in the standard relating to the difference. Each insertion is in red text and is marked by three lines on its left (two thin, one thick). Each Difference is identified with the following format:

[Clause/Subclause Number]DV[Number of Difference for the Given Clause/Subclause]

Following this format, the example 17.1DV.3 signifies that it is the third U.S. Difference to subclause 17.1.

Suggestions for the improvement of this standard are welcome and should be submitted to the Secretariat of Accredited Standards Committee W1 as follows:

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This standard was processed and approved by the Accredited Standards Committee W1. Committee approval does not necessarily imply that all Committee members voted for its approval. At the time this standard was published, Accredited Standards Committee W1 consisted of the following members:

John Freudenberg, Chairman Wayne Hoffman, Vice Chairman Greg Winchester, Secretary	
<i>Organization Represented</i>	<i>Name of Representative</i>
American Welding Society	Andrew Davis – principal Dick Holdren – alternate
CenterLine (Windsor) Limited	David Beneteau
CSA International	Andrew Krumins
ESAB Welding and Cutting	Charles Aimar
Hypertherm Inc.	Tony Zeller – principal Bill Lynn – alternate
Lincoln Electric Company	Frank Stupczy – principal Gary Mikitin – alternate
Miller Electric Manufacturing Company	David Werba – principal Terry Christianson – alternate
Northeast Product Safety Society	John Freudenberg
Wayne Hoffman – Consultant / U.S. Technical Advisor, IEC TC 26	Wayne Hoffman

The effective date for all new product submittals to this Standard is three (3) years after the publication date of this Standard. This effective date is established by the ANSI Accredited Standards Committee W1 and is not part of this Standard. This Standard cancels and replaces the first edition of ANSI/UL 60974-1 (published March 17, 2005) on the effective date.

The requirements in this Standard should be used for new product submittals made after the publication date of this Standard. If this Standard is used, a product will be evaluated under all of the requirements of this Standard. If a product within the scope of this Standard was listed to ANSI/UL 60974-1 or ANSI/UL 551, compliance with all the requirements in this Standard will be required as a condition of continued Listing after June 30, 2023.

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 third edition cancels and replaces the second edition published in 1998, amendment 1 (2000) and amendment 2 (2003) and constitutes a technical revision.

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

- The scope includes relationship to other parts of IEC 60974.
- Environmental conditions were changed (see 4.a and 4.e).
- Conformity of components is given (see 5.3).
- Sequence of type test was changed (see 5.4).
- More precise requirements for measuring the no-load voltage during routine test are given (see 5.5d).

- Creepage values for printed circuit boards are implemented (see Table 2).
- Requirements for enclosures are changed (see 6.2.1).
- Requirements for primary leakage current are included (see 6.3.7 and Annex N).
- Requirements for engine driven power sources are changed (see 7.1.2 and 7.3.2).
- Requirements for supply circuit terminals are changed (see 10.4.3 and 10.4.4).
- Requirements for cable anchorage are changed (see 10.5).
- Requirements for coupling devices are changed (see 10.9).
- Standard characteristic for plasma welding is included (11.2.6).
- Requirements for welding cables are added (see 11.7).
- Requirements for plastic material used as enclosure materials are added (see 14.2.1).
- Requirements for manual handling are added (see 14.3.2).
- Taken care of existing ISO symbols and labels (see 15.3 and 17.2).

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

FDIS	Report on voting
26/307/FDIS	26/311/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.

IEC 60974 consists of the following parts, under the general title *Arc welding equipment*:

- Part 1: Welding power sources
- Part 2: Liquid cooling systems
- Part 3: Arc striking and stabilizing devices
- Part 4: Safety, maintenance and inspection of arc welding equipment in use ¹
- Part 5: Wire feeders
- Part 6: Limited duty manual metal arc welding power sources
- Part 7: Torches
- Part 8: Gas consoles for welding and plasma cutting systems
- Part 10: Electromagnetic compatibility (EMC) requirements
- Part 11: Electrode holders
- Part 12: Coupling devices for welding cables
- Part 13: Terms ¹

¹ Under consideration.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

ForewordDV.1 **Modify the foreword by adding the following:**

The numbering system in this standard uses a space instead of a comma to indicate thousands and uses a comma instead of a period to indicate a decimal point. Examples: 1 000 means 1,000; 1,01 means 1.01.

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 that specified in Table 1 of IEC 60038, 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.

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