
Arc welding equipment - Part 2: Liquid cooling systems

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EUROPEAN STANDARD

EN 60974-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English version

Arc welding equipment
Part 2: Liquid cooling systems
(IEC 60974-2:2002)

Matériel de soudage à l'arc
Partie 2: Systèmes de refroidissement
par liquide
(CEI 60974-2:2002)

Lichtbogenschweißeinrichtungen
Teil 2: Flüssigkeitskühlsysteme
(IEC 60974-2:2002)

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This European Standard was approved by CENELEC on 2002-12-01. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, 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

Foreword

The text of the International Standard IEC 60974-2:2002, prepared by IEC TC 26, Electric welding, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 60974-2 on 2002-12-01 without any modification.

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) 2003-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2005-12-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annexes A and B are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60974-2:2002 was approved by CENELEC as a European Standard without any modification.

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Annex ZA
(normative)

**Normative references to international publications
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 60974-1	1998	Arc welding equipment Part 1: Welding power sources	EN 60974-1	1998
A1	2000		A1	2000
IEC 60974-7	2000	Part 7: Torches	EN 60974-7	2000

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INTERNATIONAL STANDARD

IEC 60974-2

First edition
2002-06

Arc welding equipment –

Part 2: Liquid cooling systems

iTeh STANDARD PREVIEW

Matériel de soudage à l'arc –

(standards.iteh.ai)

Partie 2:

Systèmes de refroidissement par liquide

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ARC WELDING EQUIPMENT –

Part 2: Liquid cooling systems

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60974-2 has been prepared by IEC technical committee 26: Electric welding.

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

FDIS	Report on voting
26/236/FDIS	26/238/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 standard shall be used in conjunction with IEC 60974-1 (1998).

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 2005. At this date, the publication will be

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

A bilingual version of this publication may be issued at a later date.

ARC WELDING EQUIPMENT –

Part 2: Liquid cooling systems

1 Scope

This part of IEC 60974 specifies safety and construction requirements for liquid cooling systems intended to cool torches. These liquid cooling systems can be internal or external to power sources for arc welding and allied processes (see annex A).

This standard is not applicable to refrigerated cooling systems.

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 60974-1:1998, *Arc-welding equipment – Part 1: Welding power sources*
Amendment 1 (2000)

IEC 60974-7:2000, *Arc-welding equipment – Part 7: Torches*

3 Terms and definitions

For the purposes of this part of IEC 60974 the definitions of IEC 60974-1, IEC 60974-7 and following apply.

3.1

liquid cooling system

system that circulates and cools liquid used for decreasing the temperature of equipment of arc welding and allied processes

3.2

internal cooling system

cooling system incorporated in a welding power source

3.3

external cooling system

cooling system not incorporated in a welding power source

3.4

cooling power (P)

cooling energy related to the mass flow rate

4 Environmental conditions

As specified in IEC 60974-1, clause 4.

5 Test conditions

As specified in IEC 60974-1, clause 5.

External cooling systems may be tested without a welding power source.

Internal cooling systems shall be tested with the welding power source.

5.1 Type tests

All type tests shall be carried out on the same cooling system except as specified otherwise.

As a condition of conformity the type tests given below shall be carried out in the following sequence:

- a) general visual inspection, as defined in IEC 60974-1, 3.7;
- b) protection provided by the enclosure, as specified in IEC 60974-1, 6.2.1;
- c) mechanical requirements, see clause 7;
- d) insulation resistance, see 6.1.3;
- e) dielectric strength, see 6.1.4.

The other tests included in this standard and not listed here may be carried out in any convenient sequence.

5.2 Routine tests

All routine tests given below shall be carried out on each cooling system in the following sequence:

- a) general visual inspection, as defined in IEC 60974-1, 3.7;
- b) continuity of the protective circuit, as specified in IEC 60974-1, 10.4.2;
- c) dielectric strength, see 6.1.4;
- d) functional test as specified by the manufacturer, for example leaks of fluid or gas, flow sensor operation.

6 Protection against electric shock

6.1 Insulation

As specified in IEC 60974-1, 6.1.

6.1.1 Clearances

As specified in IEC 60974-1, 6.1.1.

6.1.2 Creepage distances

As specified in IEC 60974-1, 6.1.2.

6.1.3 Insulation resistance

Without cooling liquid, see IEC 60974-1, 6.1.3