AS 60974.4:2025

Australian STANDARD®

STANDARDS Australia

Arc welding equipment

Part 4: Periodic inspection and testing (IEC 60974-4:2016 (ED. 3.0) MOD)



AS 60974.4:2025

This Australian Standard® was prepared by EL-019, Electrical Welding Plant. It was approved on behalf of the Standards Australia's Standards Development and Accreditation Committee on 28 March 2025.

This Standard was published on 24 April 2025.

The following are represented on Committee EL-019:

Australian Cablemakers Association
Australian Industry Group
Australian Manufacturing Workers Union
Department of Primary Industries and Regional Development
Electrical Compliance Testing Association of Australia
Resources Safety & Health Queensland
TAFE NSW
Weld Australia
Workplace Health and Safety Queensland

This Standard was issued in draft form for comment as DR AS 60974.4:2025.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:
www.standards.org.au

ISBN 978 1 76175 139 4

Arc welding equipment

Part 4: Periodic inspection and testing (IEC 60974-4:2016 (ED. 3.0) MOD)

Originated in Australia AS 60974.4:2025.



© IEC Geneva Switzerland 2025 — All rights reserved
©Standards Australia Limited 2025

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of either the IEC or the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth). If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please see the contact details on the back cover or the contact us page of the website for further information.

How to read this Standard

This page explains the meaning of the language and structure of this Standard.

Refer to Standards Australia's Standardisation Guide 006 for more details about drafting rules.

Australian and Australian/New Zealand Standards are voluntary unless they are referenced in legislation or called up in contracts.

Requirements

To conform to a Standard, all requirements in the Standard need to be met.

A requirement is any statement in the Standard which uses the word "shall".

Recommendations, permissions and possibilities

The following words are commonly used in Standards, but statements using them do not have to be followed to conform to the Standard:

(a) "should" means that something is recommended.

(b) "may" means that something is permitted.

(c) "can" means that something is possible.

Structure of Standards

A Standard always has the following parts:

(i) The Preface states who developed the Standard, what the Standard is aiming to do, and how it relates to other documents.

(ii) The Scope states what the Standard is about, what it covers and what it does not cover.

(iii) The Normative references clause lists other documents that are referenced in the Standard as part of requirements.

(iv) The Terms and definitions clause defines important terms to help with understanding the Standard.

A Standard may also include other parts, such as the following:

(1) A normative appendix sets additional requirements that need to be conformed to.

(2) An informative appendix provides additional information or guidance. An informative appendix provides additional information or guidance. They usually do not contain requirements. If an informative appendix does contain requirements, the Technical Specification will explain when those requirements apply.

(3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

This Standard is a modified adoption of an International Standard. It makes changes to the international text.

The changes to the international text are shown in boxes in the text. These boxes have the heading "National Variations".

To use this Standard in Australia/New Zealand, the changes in the national variation boxes need to be followed.

© Standards Australia Limited 2025

Preface

This Standard was prepared by the Standards Australia Committee EL-019, Electrical Welding Plant.

The objective of this document is to specify test procedures for periodic inspection and, after repair, to ensure electrical safety.

This document is an adoption with national modifications and has been reproduced from IEC 60974-4:2016, *Arc welding equipment — Part 4: Periodic inspection and testing*. The modifications are set out in national variations boxes, which give instructions where the ISO/IEC text is to be modified for use in Australia. Due to ISO/IEC copyright policy it is not possible to directly modify the ISO/IEC content.

As this document has been reproduced from an international document, the following apply:

(a) In the source text "this International Standard" should read "this document".

(b) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

© Standards Australia Limited 2025

Contents

Preface ... **iii**

Foreword ... **v**

1 Scope ... **1**

2 Normative references ... **1**

3 Terms and definitions ... **1**

4 General requirements ... **2**
4.1 Qualification of test personnel ... 2
4.2 Test conditions ... 2
4.3 Measuring instruments ... 2
4.4 Periodic inspection and test ... 2
4.5 Maintenance ... 3
4.6 Repair ... 3
4.7 Test sequence ... 3

5 Protection against electrical shock ... **4**
5.1 Visual inspection ... 4
5.2 Continuity of the protective circuit ... 4
5.3 Insulation resistance ... 4
5.4 Welding circuit touch current ... 5
5.5 Touch current in normal condition ... 5
5.6 Protective conductor current ... 6
5.7 No-load voltage (U_0) ... 7

6 Functional test ... **8**
6.1 Function ... 8
6.2 Supply-circuit on/off switching device ... 9
6.3 Voltage-reducing device ... 9
6.4 Magnetic gas valve ... 9
6.5 Signal and control lamps ... 9

7 Documentation ... **9**
7.1 Test report ... 9
7.2 Labelling ... 10

Annex A (informative) **Check-list for the visual inspection** ... **11**

Annex B (informative) **Example of a test report after repair** ... **13**

Annex C (informative) **Equipment not built in accordance with IEC 60974-1** ... **15**

List of Figures

Figure 1 — Measurement of welding circuit touch current ... 5
Figure 2 — Measurement of touch current in normal condition ... 6
Figure 3 — Principles of protective conductor current measurement for single phase equipment ... 7
Figure 4 — Measurement of peak values ... 8

List of Tables

Table 1 — Test sequence on used arc welding equipment ... 3
Table 2 — Insulation resistance ... 4

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 60974-4 has been prepared by IEC technical committee 26: Electric welding.

This third edition cancels and replaces the second edition published in 2010. It constitutes a technical revision.

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

- With regard to basic standards the term "leakage current" has been replaced by "touch current" and "protective conductor current".
- Measurements of circuits connected in a non-galvanic way shall be tested according to the information of the manufacturer.

© Standards Australia Limited 2025

- The order of the chapters dealing with measurements to be carried out has been changed.
- The example test report in Annex B has been adapted.

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

FDIS	Report on voting
26/597/FDIS	26/603/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 list of all the parts of the IEC 60974 series, under the general title *Arc welding equipment*, can be found on the IEC website.

In this standard, the following print types are used:

conformity statements: in italic type.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

© Standards Australia Limited 2025

Australian Standard®

Arc welding equipment

Part 4: Periodic inspection and testing (IEC 60974-4:2016 (ED. 3.0) MOD)

1 Scope

This part of IEC 60974 specifies test procedures for periodic inspection and, after repair, to ensure electrical safety. These test procedures are also applicable for maintenance.

This standard is applicable to power sources for arc welding and allied processes designed in accordance with IEC 60974-1 or IEC 60974-6. Stand-alone ancillary equipment designed in accordance with other parts of IEC 60974 may be tested in accordance with relevant requirements of this part of IEC 60974.

NOTE 1 The welding power source can be tested with any ancillary equipment fitted that can affect the test results.

This standard is not applicable to testing of new power sources or engine-driven power sources.

NOTE 2 For a power source not built in accordance with IEC 60974-1, see Annex C.

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, *International Electrotechnical Vocabulary – Part 151: Electrical and magnetic devices*

IEC 60050-195, *International Electrotechnical Vocabulary – Part 195: Earthing and protection against electric shock*

IEC 60050-851, *International Electrotechnical Vocabulary – Part 851: Electric welding*

IEC 60974-1:2012, *Arc welding equipment – Part 1: Welding power sources*

IEC 60974-6, *Arc welding equipment – Part 6: Limited duty equipment*

IEC 61557-4, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 4: Resistance of earth connection and equipotential bonding*

IEC 61140, *Protection against electric shock – Common aspects for installation and equipment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in the IEC 60050-151, the IEC 60050-195, the IEC 60050-851, the IEC 60974-1, as well as the following, apply.

3.1
expert
competent person
skilled person
a person who can judge the work assigned and recognize possible hazards on the basis of professional training, knowledge, experience and knowledge of the relevant equipment

Note 1 to entry: Several years of practice in the relevant technical field may be taken into consideration in assessment of professional training.

© Standards Australia Limited 2025