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oSIST prEN IEC 60974-4:2024
01-julij-2024

Oprema za oblačno varjenje - 4. del: Periódni pregledi in preskus

Arc welding equipment - Part 4: Periodic inspection and testing

Lichtbogenschweißeinrichtungen - Teil 4: Wiederkehrende Inspektion und Prüfung

Matériel de soudage à l'arc - Partie 4: Inspection et essais périodiques

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TITLE:

Arc welding equipment - Part 4: Periodic inspection and testing

PROPOSED STABILITY DATE: 2025

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62 INTERNATIONAL ELECTROTECHNICAL COMMISSION

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66 **ARC WELDING EQUIPMENT –**

67

68 **Part 4: Periodic inspection and testing**

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71 **FOREWORD**

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73 all national electrotechnical committees (IEC National Committees). The object of IEC is to promote
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102 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is
103 indispensable for the correct application of this publication.

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105 patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

106 International Standard IEC 60974-4 has been prepared by IEC technical committee 26:
107 Electric welding.

108 This fourth edition cancels and replaces the third edition published in 2016. It constitutes a
109 technical revision.

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

111 • Examples for the measurements in respect of EN 50699, Recurrent Test of Electrical
112 Equipment and EN 50678, General procedure for verifying the effectiveness of the
113 protective measures of electrical equipment after repair;

114 • Consideration of measuring equipment in respect of IEC 61557-series, Electrical safety in
115 low voltage distribution systems up to 1 000 V AC and 1 500 V DC - Equipment for testing,
116 measuring or monitoring of protective measures;

• More determinations of NO-LOAD VOLTAGE for welding equipment built according to IEC
60974-1:1998+AMD1:20002005 or earlier;

- 117 • New Annex D providing additional information to be considered when testing battery-
118 powered WELDING POWER SOURCES and connected chargers;

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

FDIS	Report on voting

120
121 Full information on the voting for the approval of this standard can be found in the report on
122 voting indicated in the above table.

123 This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

126 In this standard, the following print types are used:

- 127 • *conformity statements: in italic type.*

128 The committee has decided that the contents of this publication will remain unchanged until
129 the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data
130 related to the specific publication. At this date, the publication will be

- 131 • reconfirmed,
132 • withdrawn,
133 • replaced by a revised edition, or
134 • amended.

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ARC WELDING EQUIPMENT –

Part 4: Periodic inspection and testing

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1 Scope

144 This part of IEC 60974 specifies test procedures for PERIODIC INSPECTION and, after
145 REPAIR, to ensure electrical safety. These test procedures are also applicable for
146 MAINTENANCE.

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

151 NOTE 1 The WELDING POWER SOURCE can be tested with any ancillary equipment fitted that can affect the
152 test results.

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

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

2 Normative references

157 The following documents are referred to in the text in such a way that some or all of their
158 content constitutes requirements of this document. For dated references, only the edition
159 cited applies. For undated references, the latest edition of the referenced document (including
160 any amendments) applies.

161 IEC 60050-151, *International Electrotechnical Vocabulary – Part 151: Electrical and magnetic*
162 *devices*

163 IEC 60050-192, *International Electrotechnical Vocabulary – Part 192 - Dependability*

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

166 IEC 60050-426, *International Electrotechnical Vocabulary – Part 426: Equipment for explosive*
167 *atmospheres*

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

169 IEC 60974-1:2021, *Arc welding equipment – Part 1: Welding power sources*

170 IEC 60974-6:2015, *Arc welding equipment – Part 6: Limited duty equipment*

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

173 IEC 61557-2:2019, *Electrical safety in low voltage distribution systems up to 1 000 V AC and*
174 *1 500 V DC - Equipment for testing, measuring or monitoring of protective measures - Part 2:*
175 *Insulation resistance*

176 IEC 61557-4:2021, Electrical safety in low voltage distribution systems up to 1 000 V AC and
177 1 500 V DC - Equipment for testing, measuring or monitoring of protective measures - Part 4:
178 Resistance of earth connection and equipotential bonding

179 IEC 61557-16:2014, Electrical safety in low voltage distribution systems up to 1 000 V a.c.
180 and 1 500 V d.c - Equipment for testing, measuring or monitoring of protective measures -
181 Part 16: Equipment for testing the effectiveness of the protective measures of electrical
182 equipment and/or medical electrical equipment

183 **3 Terms and definitions**

184 For the purposes of this document, the terms and definitions given in IEC 60050-151 and IEC 60974-
185 1, as well as the following apply.

186 ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- 187
- 188
- 189 • IEC Electropedia: available at <http://www.electropedia.org/>
- 190 • ISO Online browsing platform: available at <http://www.iso.org/obp>

191 **3.1**

192 **welding power source**

193 **arc welding power source**

194 equipment for supplying current and voltage and having the required characteristics suitable
195 for arc welding and allied processes

196 Note 1 to entry: A WELDING POWER SOURCE can also supply services to other equipment and auxiliaries for
197 example auxiliary power, cooling liquid, consumable arc welding electrode and gas to shield the arc and the
198 welding area.

199 Note 2 to entry: This entry revises IEC 60050-851:2008, 851-13-01, which will be updated.

200

201 **3.2**

202 **expert**

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203 person who can judge the work assigned and recognize possible hazards on the basis of
204 professional training, knowledge, experience and knowledge of the relevant equipment

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

207 [SOURCE: IEC 60050-851:2008, 851-11-10]

208 **3.3**

209 **instructed person**

210 person informed about the tasks assigned and about the possible hazards involved in
211 neglectful behavior

212 Note: If necessary, the person has undergone some training.

213 [SOURCE: IEC 60050-851:2008, 851-11-13]

214 **3.4**

215 **periodic inspection**

216 inspection of all equipment, systems and installations carried out on a routine basis

217 [SOURCE: IEC 60050-426:2020, 426-14-07]

218 **3.5**
219 **maintenance**
220 combination of all technical and management actions intended to retain an item in, or restore
221 it to, a state in which it can perform as required

222 Note to entry: Management is assumed to include supervision activities

223
224 [SOURCE: IEC 60050-192:2015, 192-06-01]

225 **3.6**
226 **repair**
227 direct action taken to effect restoration

228 Note to entry: REPAIR includes fault localization (192-06-19), fault diagnosis (192-06-20); fault correction (192-06-
229 21); and function checkout (192-06-22).

230
231 [SOURCE: IEC 60050-192:2015, 192-06-14]

232 **3.7**
233 **no-load voltage**
234 voltage, exclusive of any arc striking or arc stabilizing voltage, between the accessible output
235 terminals of a WELDING POWER SOURCE when the WELDING CIRCUIT is open but
236 energized

237 Note 1 to entry: This entry revises IEC 60050-851:2008, 851-12-24, which will be updated.

238 **3.8**
239 **touch current**
240 electric current passing through a human body or through an animal body when it touches one
241 or more accessible parts of an installation or of equipment

242 Note 1 to entry: TOUCH CURRENT is measured by using a measuring network that simulates the impedance of the
243 human body.

244 [SOURCE: IEC 60050-195:1998, 195-05-21, modified – Addition of a note to entry.]

245 **3.9**
246 **visual inspection**
247 inspection by eye to verify that there are no apparent discrepancies with respect to provisions
248 of the standard concerned

249 [SOURCE: IEC 60050-851:2008, 851-11-11]

250 **3.10**
251 **welding circuit**
252 conductive material through which the WELDING CURRENT is intended to flow

253 Note 1 to entry: In arc welding, the arc is a part of the WELDING CIRCUIT.

254 Note 2 to entry: In certain arc welding processes, the welding arc can be established between two electrodes. In
255 such a case, the workpiece is not necessarily a part of the WELDING CIRCUIT.

256 [SOURCE: IEC 60050-851:2008, 851-14-10]

257 **3.11**
258 **welding current**
259 current delivered by a WELDING POWER SOURCE during welding

260 **3.12**
261 **environment with increased risk of electric shock**
262 environment where the probability of electric shock by arc welding is increased in relation to
263 normal arc welding conditions