



SLOVENSKI STANDARD
oSIST prEN IEC 61442:2022
01-september-2022

Preskusne metode za pribor energetskih kablov za naznačene napetosti od 6 kV (Um = 7,2 kV) do 30 kV (Um = 36 kV)

Test methods for accessories for power cables with rated voltages from 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV)

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Méthodes d'essais des accessoires de câbles d'énergie de tensions assignées de 6 kV (Um = 7,2 kV) à 30 kV (Um = 36 kV)

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| OF INTEREST TO THE FOLLOWING COMMITTEES: | PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary. |
| FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY | |
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TITLE:

Test methods for accessories for power cables with rated voltages from 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV)

PROPOSED STABILITY DATE: 2030

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CONTENTS

| | | |
|----|-------|--|
| 1 | | |
| 2 | 1 | Scope.....7 |
| 3 | 2 | Normative references7 |
| 4 | 3 | Test installations and conditions8 |
| 5 | 4 | AC voltage tests8 |
| 6 | 4.1 | Dry test for all accessories8 |
| 7 | 4.1.1 | Installation.....8 |
| 8 | 4.1.2 | Method8 |
| 9 | 4.2 | Wet test for outdoor terminations.....9 |
| 10 | 4.2.1 | Installation.....9 |
| 11 | 4.2.2 | Method10 |
| 12 | 4.3 | Test in water for stop ends10 |
| 13 | 4.3.1 | Installation.....10 |
| 14 | 4.3.2 | Method10 |
| 15 | 5 | DC voltage tests10 |
| 16 | 5.1 | Installation10 |
| 17 | 5.2 | Method10 |
| 18 | 6 | Impulse voltage tests.....10 |
| 19 | 6.1 | Installation10 |
| 20 | 6.2 | Method.....10 |
| 21 | 6.3 | Test at elevated temperature.....10 |
| 22 | 7 | Partial discharge test.....11 |
| 23 | 7.1 | Method.....11 |
| 24 | 7.2 | Test at elevated temperature11 |
| 25 | 8 | Tests at elevated temperature11 |
| 26 | 8.1 | Installation and connection11 |
| 27 | 8.2 | Measurement of temperature.....11 |
| 28 | 8.2.1 | Cable conductor temperature.....11 |
| 29 | 8.2.2 | Thermocouple position12 |
| 30 | 9 | Heating cycles voltage test.....16 |
| 31 | 9.1 | Installation and method16 |
| 32 | 9.2 | Test in air16 |
| 33 | 9.3 | Test in water16 |
| 34 | 9.4 | Immersion test for outdoor terminations.....17 |
| 35 | 9.4.1 | Installation.....17 |
| 36 | 9.4.2 | Method17 |
| 37 | 10 | Thermal short-circuit test (screen)17 |
| 38 | 10.1 | Installation17 |
| 39 | 10.2 | Method.....17 |
| 40 | 11 | Thermal short-circuit test (conductor)18 |
| 41 | 11.1 | Installation18 |
| 42 | 11.2 | Method.....18 |
| 43 | 12 | Dynamic short-circuit test20 |
| 44 | 12.1 | Installation20 |
| 45 | 12.2 | Method.....20 |
| 46 | 13 | Humidity and salt fog tests20 |

| | | |
|----|--|----|
| 47 | 13.1 Apparatus..... | 20 |
| 48 | 13.2 Installation | 21 |
| 49 | 13.3 Method..... | 21 |
| 50 | 14 Impact test at ambient temperature | 21 |
| 51 | 15 Screen resistance measurement..... | 23 |
| 52 | 15.1 Installation | 23 |
| 53 | 15.2 Method..... | 23 |
| 54 | 16 Screen leakage current measurement | 23 |
| 55 | 16.1 Installation | 23 |
| 56 | 16.2 Method..... | 23 |
| 57 | 17 Screen fault current initiation test | 24 |
| 58 | 17.1 Installation | 24 |
| 59 | 17.2 Method..... | 25 |
| 60 | 17.2.1 Solidly earthed system | 25 |
| 61 | 17.2.2 Unearthed or impedance earthed system..... | 25 |
| 62 | 18 Operating force test..... | 26 |
| 63 | 18.1 Installation | 26 |
| 64 | 18.2 Method..... | 26 |
| 65 | 19 Operating eye test..... | 26 |
| 66 | 19.1 Installation | 26 |
| 67 | 19.2 Method..... | 26 |
| 68 | 20 Capacitive test point performance | 27 |
| 69 | 20.1 Installation | 27 |
| 70 | 20.2 Test method | 27 |
| 71 | Annex A (informative) Determination of the cable conductor temperature..... | 28 |
| 72 | A.1 Purpose | 28 |
| 73 | A.2 Calibration of the test cable conductor temperature | 28 |
| 74 | A.2.1 Installation of cable and thermocouples | 28 |
| 75 | A.2.2 Method | 29 |
| 76 | A.3 Heating for accessory test..... | 30 |
| 77 | A.3.1 Method 1: Test based on measurement of ambient temperature | 30 |
| 78 | A.3.2 Method 2: Test based on measurement of the external surface | |
| 79 | temperature..... | 31 |
| 80 | A.3.3 Method 3: Test using a control cable | 32 |
| 81 | Annex B (informative) Details of the test chamber and spray equipment for humidity | |
| 82 | and salt fog tests | 34 |
| 83 | B.1 Test chamber | 34 |
| 84 | B.2 Spray equipment for humidity and salt fog tests..... | 34 |
| 85 | B.3 High voltage transformers | 35 |
| 86 | | |
| 87 | Figure 1 – Terminations tested in air..... | 12 |
| 88 | Figure 2 – Joints tested in air..... | 12 |
| 89 | Figure 3 – Separable connectors tested in air | 13 |
| 90 | Figure 4 – Joints tested under water | 13 |
| 91 | Figure 5 – Separable connectors tested under water | 14 |
| 92 | Figure 6 – Outdoor terminations tested under water..... | 15 |
| 93 | Figure 7 – Heating cycle | 16 |

| | | |
|-----|--|----|
| 94 | Figure 8 – Typical impact test apparatus for joints | 22 |
| 95 | Figure 9 – Test arrangement for the screen leakage current measurement | 24 |
| 96 | Figure 10 – Test arrangement for screen fault current initiation test | 25 |
| 97 | Figure A.1 – Reference cable..... | 29 |
| 98 | Figure A.2 – Arrangement of the thermocouples | 29 |
| 99 | Figure A.3 – Current/temperatures curves..... | 31 |
| 100 | | |
| 101 | | |

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**TEST METHODS FOR ACCESSORIES
FOR POWER CABLES WITH RATED VOLTAGES
FROM 6 kV ($U_m = 7,2$ kV) UP TO 30 kV ($U_m = 36$ kV)**

FOREWORD

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International Standard IEC 61442 has been prepared by IEC technical committee 20: Electric cables.

This third edition of IEC 61442 cancels and replaces the second edition of IEC 61442, published in 2005, and constitutes a technical revision.

Significant technical changes with respect to the previous edition are as follows:

- a) 3.6 - *the option to start tests immediately has been included*
- b) 4.3.2 & 9.3 - *details of Insulation resistance testing added*
- c) 10.1 – *inclusion to allow testing of accessories with external earthing devices.*
- d) 10.2 – *short circuit duration and maximum kA levels added*
- e) 10.2 – *temperature measurement not required if time between short circuits >1hr.*

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

| FDIS | Report on voting |
|-------|------------------|
| xxxxx | xxxxxx |

156

157 Full information on the voting for the approval of this standard can be found in the report on
158 voting indicated in the above table.

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

160 The committee has decided that the contents of this publication will remain unchanged until the
161 maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data
162 related to the specific publication. At this date, the publication will be

- 163 • reconfirmed;
- 164 • withdrawn;
- 165 • replaced by a revised edition, or
- 166 • amended.

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169 **TEST METHODS FOR ACCESSORIES**
170 **FOR POWER CABLES WITH RATED VOLTAGES**
171 **FROM 6 kV ($U_m = 7,2$ kV) UP TO 30 kV ($U_m = 36$ kV)**
172
173
174

175 **1 Scope**

176 This International Standard specifies the test methods to be used for type testing accessories
177 for power cables with rated voltage from 3,6/6 (7,2) kV up to 18/30 (36) kV. Test methods are
178 specified for accessories for extruded and paper insulated cables according to IEC 60502-2
179 and IEC 60055-1 respectively.

180 **2 Normative references**

181 The following referenced documents are indispensable for the application of this document. For
182 dated references, only the edition cited applies. For undated references, the latest edition of
183 the referenced document (including amendments) applies.

184 IEC 60055-1:1997+AMD1:2005, *Paper-insulated metal-sheathed cables for rated voltages up*
185 *to 18/30 kV (with copper or aluminium conductors and excluding gas-pressure and oil-filled*
186 *cables) – Part 1: Tests on cables and their accessories*

187 IEC 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test*
188 *requirements*

189 IEC 60230:2018, *Impulse tests on cables and their accessories*

190 IEC 60270:2000+A1:2005, *High-voltage test techniques – Partial discharge measurements*

191 IEC 60502-2, *Power cables with extruded insulation and their accessories for rated voltages*
192 *from 1 kV ($U_m = 1,2$ kV) up to 30 kV ($U_m = 36$ kV) – Part 2: Cables for rated voltages from 6 kV*
193 *($U_m = 7,2$ kV) up to 30 kV ($U_m = 36$ kV)*

194 IEC 60811-401:2012+A1:2017, *Electric and optical fibre cables - Test methods for non-metallic*
195 *materials. Part 401: Miscellaneous tests - Thermal ageing methods - Ageing in an air oven*

196 IEC 60885-2:1987, *Electrical test methods for electric cables – Part 2: partial discharge tests*

197 IEC 60986:2000+A1:2008, *Short-circuit temperature limits of electric cables with rated voltages*
198 *from 6 kV ($U_m = 7,2$ kV) up to 30 kV ($U_m = 36$ kV)*

199 IEC 61238-1-3:2018, *Compression and mechanical connectors for power cables for rated*
200 *voltages up to 30 kV ($U_m = 36$ kV) – Part 1:3: Test methods and requirements for compression*
201 *and mechanical connectors for power cables for rated voltages above 1 kV ($U_m = 1,2$ kV) up to*
202 *30 kV ($U_m = 36$ kV) tested on non-insulated conductors*

203 IEC 60507:2013, *Artificial pollution tests on high-voltage ceramic and glass insulators to be*
204 *used on a.c. systems*

205 IEC 60949:1988+A1:2008, *Calculation of thermally permissible short-circuit currents, taking*
206 *into account non-adiabatic heating effects*

207

208 3 Test installations and conditions

209 3.1 The test methods described in this standard are intended to be used for type tests.

210 3.2 Test arrangements and the number of test samples are given in the relevant standard.

211 3.3 The test conditions are specified in Clauses 4 to 20 of this standard. When they are not,
212 they shall be as specified in the relevant standards.

213 3.4 Unless otherwise stated, the testing parameters and the requirements are given in the
214 relevant standard.

215 3.5 For transition joints (either extruded insulation to extruded insulation or extruded insulation
216 to paper insulation), the testing parameters (voltage and conductor temperature) are those for
217 the lower rated cable.

218 3.6 The tests can be started immediately after installation of accessories on the cable test
219 loops, unless otherwise specified by the manufacturer. The time interval shall be recorded in
220 the test report.

221 3.7 Cable screens, and armour if any, shall be bonded and earthed at one end only to prevent
222 circulating currents.

223 3.8 All parts of an accessory which are normally earthed shall be connected to the cable
224 screen. Any supporting metalwork shall also be earthed.

225 3.9 Ambient temperature shall be (20 ± 15) °C.

226 3.10 Tap water shall be used for all tests in water.

227 3.11 Tests on belted cables.

228 When conducting AC voltage tests and heating cycle voltage tests a three-phase test voltage
229 and current system should be used.

230 When conducting DC voltage and the impulse tests the test voltage must be applied to one
231 cable conductor and the other 2 cable conductors and the screen must be earthed. All cable
232 conductors must be tested separately

233 4 AC voltage tests

234 4.1 Dry test for all accessories

235 4.1.1 Installation

236 The set(s) of accessories shall be erected with all associated metalwork and fittings. The
237 accessories shall be clean and dry before applying the test voltage.

238 4.1.2 Method

239 Unless otherwise specified, the test shall be made at ambient temperature, and the procedure
240 for voltage application shall be as specified in Section 5 of IEC 60060-1:2010.

241 **4.2 Wet test for outdoor terminations**

242 **4.2.1 Installation**

243 The terminations shall be erected in a vertical position, unless they are to be specifically
244 installed in another orientation, with the relative spacing as under service conditions and
245 according to manufacturer's instructions.

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247 **4.2.2 Method**

248 Unless otherwise specified, the wet test method is as described in 9.1 of IEC 60060-1:2010,
249 and shall be carried out at ambient temperature.

250 **4.3 Test in water for stop ends**

251 **4.3.1 Installation**

252 The stop ends shall be installed in a water tank of such dimensions as to have a height of water
253 of $1,00^{+0,02}_0$ m over their top surface, unless otherwise specified. The water shall be at ambient
254 temperature.

255 **4.3.2 Method**

256 Unless otherwise specified, the procedure for voltage application shall be as specified in
257 IEC 60060-1:2010.

258 After the AC voltage withstand, the insulation resistance shall be measured between the screen
259 and water. The D.C. test voltage shall be in the range of 100 V to 1 000 V and shall be applied
260 for a sufficient time to reach reasonably steady measurement, but in any case, not less than
261 1 min and not more than 5 min.

262 **5 DC voltage tests**

263 **5.1 Installation**

264 The set(s) of accessories shall be erected with all associated metalwork and fittings. The
265 accessories shall be clean and dry before applying the test voltage.

266 **5.2 Method**

267 A voltage of negative polarity shall be applied to the cable conductor.

268 The test shall be made at ambient temperature and the procedure for voltage application shall
269 be as specified in Section 4 of IEC 60060-1:2010.

270 **6 Impulse voltage tests**

271 **6.1 Installation**

272 For preparation of the test installation, involving metal enclosures and terminal boxes, reference
273 shall be made to the relevant standard.

274 In the case of three-core accessories (such as three single-core terminations in an enclosure),
275 one phase shall be tested at a time, with the other two phases earthed.

276 **6.2 Method**

277 The test shall be conducted according to the procedure given in IEC 60230:2018 (Clause 3 and
278 following).

279 **6.3 Test at elevated temperature**

280 Installation and the measurement of temperature are given in Clause 8 of this standard.

281 The cable conductor shall be heated and stabilized for at least 2 h at a temperature of