



SLOVENSKI STANDARD
oSIST prEN IEC 61316:2019

01-oktober-2019

Industrijski kabelski koluti

Industrial cable reels

Leitungsroller für industrielle Anwendung

Enrouleurs de câble industriels

Ta slovenski standard je istoveten z: prEN IEC 61316:2019

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ICS:

| | | |
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| 29.120.99 | Druga električna dodatna oprema | Other electrical accessories |
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23H/459/CDV

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| | |
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| IEC SC 23H : PLUGS, SOCKET-OUTLETS AND COUPLERS FOR INDUSTRIAL AND SIMILAR APPLICATIONS, AND FOR ELECTRIC VEHICLES | |
| SECRETARIAT: France | SECRETARY: Mr Bertrand Doignon |
| 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 | |
| <input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING <input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING | |
| <p>Attention IEC-CENELEC parallel voting oSIST prEN IEC 61316:2019</p> <p>The attention of IEC National Committees members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.</p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p> | |

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TITLE:

Industrial cable reels

PROPOSED STABILITY DATE: 2025

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INDUSTRIAL CABLE REELS

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FOREWORD

83 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising
 84 all national electrotechnical committees (IEC National Committees). The object of IEC is to promote
 85 international co-operation on all questions concerning standardization in the electrical and electronic fields. To
 86 this end and in addition to other activities, IEC publishes International Standards, Technical Specifications,
 87 Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC
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 89 in the subject dealt with may participate in this preparatory work. International, governmental and non-
 90 governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely
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 92 agreement between the two organizations.

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 94 consensus of opinion on the relevant subjects since each technical committee has representation from all
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 102 between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in
 103 the latter.

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 105 assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any
 106 services carried out by independent certification bodies.

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 110 other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and
 111 expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC
 112 Publications.

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 114 indispensable for the correct application of this publication.

115 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of
 116 patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

117 International Standard IEC 61316 has been prepared by subcommittee 23H: Plugs, socket-
 118 outlets and couplers for industrial and similar applications, and for electric vehicles, of IEC
 119 technical committee 23: Electrical accessories.

120 This third edition cancels and replaces the second edition, published in 1999, and constitutes
 121 an editorial and technical revision.

122 This edition includes the following significant technical changes with respect to the previous
 123 edition:

124 a) Implementation of the latest tests and requirements previously included in IEC 60309-1
 125 publication;

126 In addition, this document implements the latest ISO/IEC Directives Part 2 Ed. 7.0 (2016-05):
 127 *principles and rules for the structuring and drafting of ISO and IEC documents*;

128 The text of this International Standard is based on the following documents:

129

130

| FDIS | Report on voting |
|--------------|------------------|
| 23H/---/FDIS | 23H/---/RVD |

131 Full information on the voting for the approval of this International Standard can be found in
132 the report on voting indicated in the above table.

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

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

- 137 • reconfirmed,
138 • withdrawn,
139 • replaced by a revised edition, or
140 • amended.

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INDUSTRIAL CABLE REELS

1 Scope

146 This International Standard applies to cable reels provided with a non-detachable flexible
147 cable with a rated operating voltage not exceeding 690 V AC/DC and 500 Hz with a rated
148 current not exceeding 63 A, primarily intended for industrial use, either indoors or outdoors,
149 for use with accessories complying with IEC 60309-1, IEC 60309-2 or IEC 60309-4.

150 This document applies to:

- 151 – portable cable reels equipped with one plug or appliance-inlet complying with IEC 60309-1
152 or IEC 60309-2 and at least one fixed or portable socket-outlet complying with IEC
153 60309-1, IEC 60309-2 or IEC 60309-4;
- 154 – fixed cable reels equipped with at least one fixed or portable socket-outlet complying with
155 IEC 60309-1, IEC 60309-2 or IEC 60309-4;
- 156 – cable reels suitable for use at ambient temperature normally within the range of –25 °C
157 to +40 °C.

158 The use of this equipment on construction sites and for agricultural, commercial and domestic
159 appliances is not precluded.

160 This document also applies to cable reels intended to be used in extra-low voltage
161 installations.

162 In locations where special conditions prevail, for example, on board ships, in vehicles and the
163 like, or where explosions are liable to occur, additional requirements may be necessary.

164 NOTE 1 - This document was not developed for EV application, but it can be used as guide for cable reels for EV
165 application

166 NOTE 2 – Additional requirements for cable reels for currents higher than 63 A are under consideration.

2 Normative references

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

172 IEC 60050 (195):1998, *International Electrotechnical Vocabulary (IEV) – Part 195: Earthing
173 and protection against electric shock*

174 IEC 60068-2-75, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

175 IEC 60245 (all parts), *Rubber insulated cables – Rated voltages up to and including
176 450/750 V*

177 IEC 60309-1, *Plugs, fixed or portable socket-outlets and appliance inlets for industrial
178 purposes – Part 1: General requirements*

179 IEC 60309-2, *Plugs, fixed or portable socket-outlets and appliance inlets for industrial
180 purposes – Part 2: Dimensional interchangeability requirements for pin and contact-tube
181 accessories*

182 IEC 60309-4, *Plugs, fixed or portable socket-outlets and appliance inlets for industrial
183 purposes – Part 4: Switched socket-outlets with or without interlock*

184 IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

185 ISO 2093, *Electroplated coatings of tin -- Specification and test methods*

186 **3 Terms and definitions**

187 For the purposes of this document, the following terms and definitions apply.

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

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

192 Where the terms “voltage” and “current” are used, they imply the direct current (DC) or
193 alternating current (AC) root mean square (RMS) values.

194 **3.1**

195 **rated operating voltage**

196 voltage assigned to the cable reel by the manufacturer

197 [SOURCE: IEC 60309-1:2018, 3.13, modified: accessory is replaced by cable reel]

198 **3.2**

199 **rated current**

200 current assigned to the cable reel by the manufacturer

201 [SOURCE: IEC 60309-1:2018, 3.11, modified: accessory is replaced by cable reel]

202 **3.3**

203 **cable reel**

204 device comprising a flexible cable attached to a reel, so constructed that the cable may be
205 wound on to a reel

206 Note 1 to entry: Plugs, socket-outlets and appliance inlets, if any, supplied with cable reels are considered as part
207 of the reel.

208 **3.3.1**

209 **portable cable reel**

210 cable reel which can be moved easily from one place to another

211 **3.3.2**

212 **fixed cable reel**

213 cable reel intended for mounting on a fixed support

214 **3.4**

215 **non-detachable flexible cable**

216 flexible cable which is fixed to a cable reel

217 **3.5**

218 **rewireable cable reel**

219 cable reel so constructed that the flexible cable can be replaced with the aid of a general-
220 purpose tool

221 **3.6**

222 **non-rewireable cable reel**

223 cable reel so constructed that it forms a complete unit with the flexible cable, the plug and the
224 socket-outlets fixed by the manufacturer of the cable reel in such a manner that, after
225 dismantling, the cable reel is rendered unfit for any further purpose

- 226 **3.7**
227 **accessible part**
228 part which can be touched by means of the standard test finger
- 229 **3.8**
230 **detachable part**
231 part which can be removed without the aid of a general-purpose tool
- 232 **3.9**
233 **creepage distance**
234 shortest path along the surface of an insulating material between two conductive parts
- 235 **3.10**
236 **clearance**
237 shortest distance in air between two conductive parts
- 238 **3.11**
239 **thermal cut-out**
240 temperature-sensing control device intended to switch off automatically under abnormal
241 operating conditions and which has no provision for adjustment by the user
- 242 **3.12**
243 **current cut-out**
244 current-sensing control device intended to switch off automatically under abnormal operating
245 conditions and which has no provision for adjustment by the user
- 246 **3.13**
247 **trip-free mechanism**
248 mechanism designed so that disconnection can neither be prevented nor inhibited by a reset
249 mechanism, and so that the contacts can neither be prevented from opening nor be
250 maintained closed against a continuation of the excess temperature or current
- 251 **3.14**
252 **non-self-resetting thermal or current cut-out**
253 thermal or current cut-out which can only be reset by a manual action directly acting on the
254 device which is used exclusively for this purpose and which is mounted in the cable reel or for
255 fixed cable reel as a separate unit within sight of the cable reel
- 256 **3.15**
257 **basic insulation**
258 insulation of hazardous-live-parts which provides basic protection
- 259 [SOURCE IEC 195-06-06]
- 260 **3.16**
261 **supplementary insulation**
262 independent insulation applied in addition to the basic insulation, for fault protection
- 263 [SOURCE IEC 195-06-07]
- 264 **3.17**
265 **double insulation**
266 insulation comprising both basic insulation and supplementary insulation
- 267 [SOURCE IEC 195-06-08]

268 **3.18**
 269 **reinforced insulation**
 270 insulation of hazardous-live-parts which provides a degree of protection against electric shock
 271 equivalent to double insulation

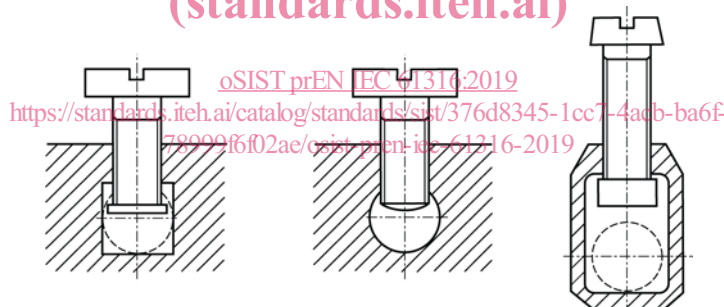
272 NOTE – Reinforced insulation may comprise several layers which cannot be tested singly as basic insulation or
 273 supplementary insulation.

274 [SOURCE IEC 195-06-09]

275 **3.19**
 276 **termination**
 277 insulated or non-insulated connecting device for non-reusable connection of the conductors of
 278 the supply cable

279 **3.20**
 280 **terminal**
 281 conductive part of one pole, composed of one or more clamping unit(s) and insulation if
 282 necessary

283 **3.20.1**
 284 **pillar terminal**
 285 a terminal in which the conductor is inserted into a hole or cavity, where it is clamped under
 286 the shank of the screw or screws. The clamping pressure may be applied directly by the
 287 shank of the screw or through an intermediate clamping member to which pressure is applied
 288 by the shank of the screw (see Figure 1)

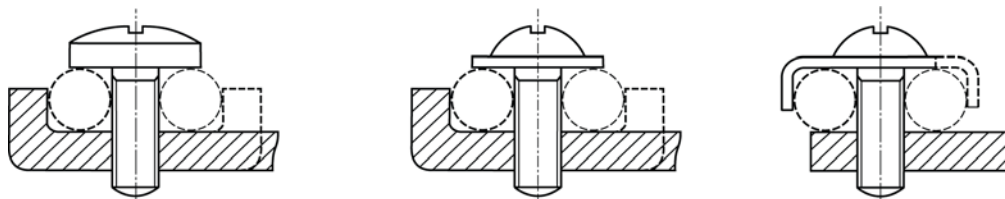


289

290

Figure 1 – Pillar terminals

291 **3.20.2**
 292 **screw terminal**
 293 a terminal in which the conductor is clamped under the head of the screw. The clamping
 294 pressure may be applied directly by the head of the screw or through an intermediate part,
 295 such as a washer, clamping plate or anti-spread device (see Figure 2)



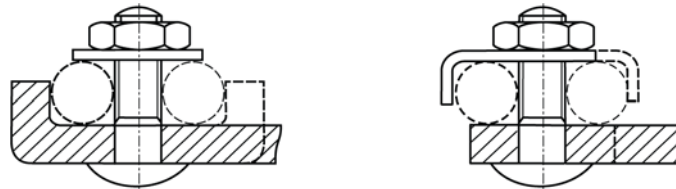
296

297

Figure 2 – Screw terminals

298 **3.20.3**
299 **stud terminal**

300 a terminal in which the conductor is clamped under a nut. The clamping pressure may be
301 applied directly by a suitably shaped nut or through an intermediate part, such as a washer,
302 clamping plate or anti-spread device (see Figure 3)



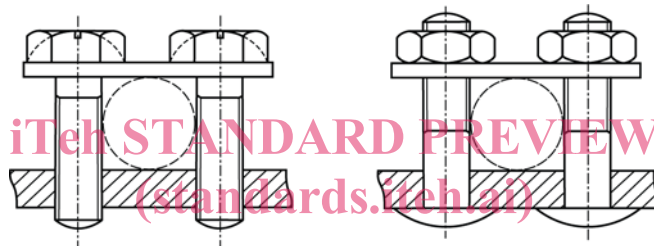
303

304

Figure 3 – Stud terminals

305 **3.20.4**
306 **saddle terminal**

307 a terminal in which the conductor is clamped under a saddle by means of two or more screws
308 or nuts (see Figure 4)



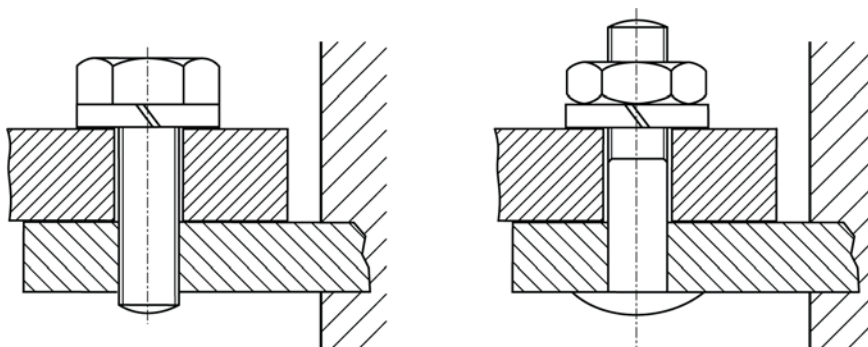
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<https://standards.iteh.org/standards-detail/1cc7-4acb-ba6f-78999f6f02ae/osist-pr-en-iec-61316-2019>
Figure 4 – Saddle terminals

311 **3.20.5**
312 **lug terminal**

313 a screw terminal or a stud terminal, designed for clamping a cable lug or bar by means of a
314 screw or nut (see Figure 5)



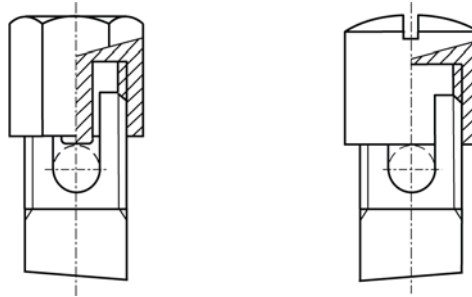
315

316

Figure 5 – Lug terminals

317 **3.20.6**
318 **mantle terminal**

319 a terminal in which the conductor is clamped against the base of a slot in a threaded stud by
320 means of a nut. The conductor is clamped against the base of the slot by a suitably shaped
321 washer under the nut, by a central peg if the nut is a cap nut, or by equally effective means
322 for transmitting the pressure from the nut to the conductor within the slot (see Figure 6)



323

324

Figure 6 – Mantle terminals

3.20.7

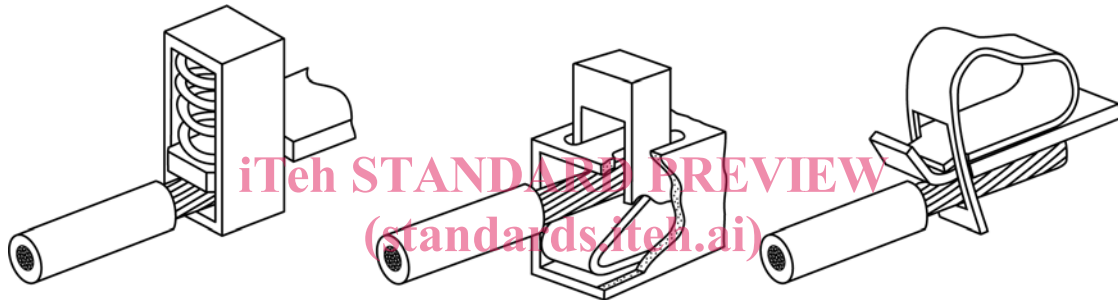
screwless type terminal

a terminal for the connection and subsequent disconnection of one or more conductors, the connection being made, directly or indirectly, by other means than screws

328

Note 1 to entry: Examples of screwless type terminals are given in Figure 7.

329



330

331

Figure 7 – Screwless terminals

3.20.8

insulation piercing terminal (IPT)

a terminal for the connection and subsequent disconnection of one or more conductors, the connection being made by piercing, boring through, cutting through, displacing or making ineffective in some other manner the insulation of the conductor(s) without previous stripping

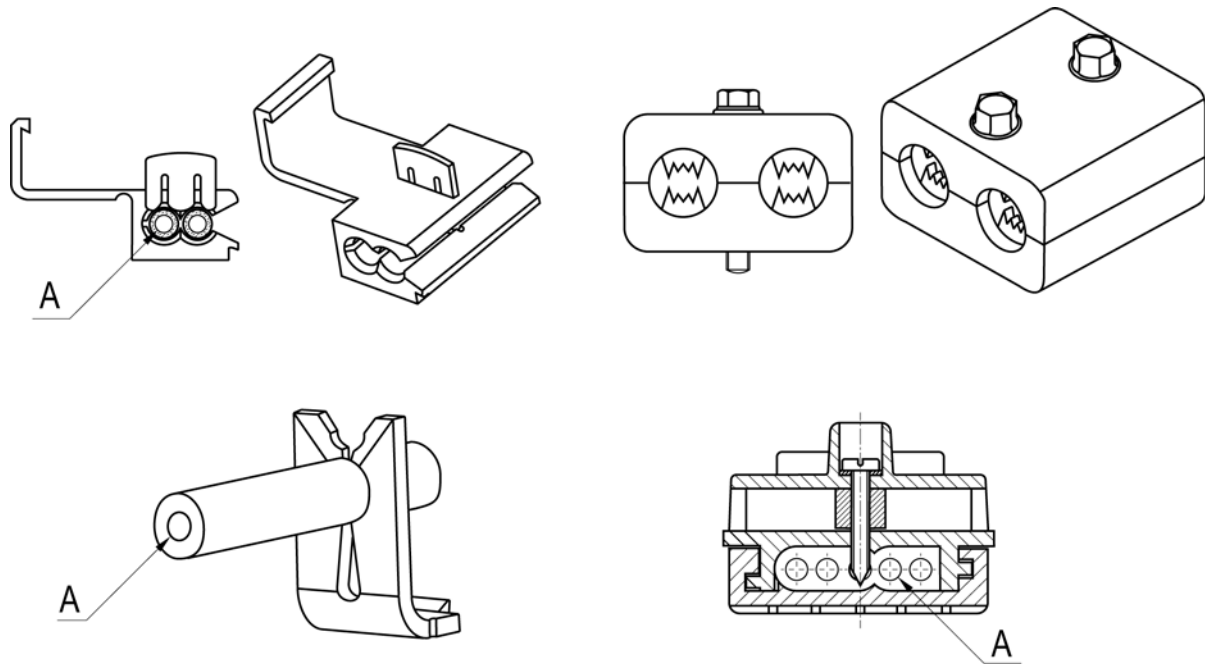
336

Note 1 to entry: The removal of the outer sheath of the cable, if necessary, is not considered as a previous stripping.

338

Note 2 to entry: Examples of IPT are given in Figure 8.

339



340

Key

A Conductor

341

Figure 8 – Insulation piercing terminals
(standards.iteh.ai)

3.21**clamping unit(s)**

part(s) of the terminal necessary for mechanical clamping and electrical connection of the conductor(s), including the parts which are necessary to ensure the correct contact pressure

345

3.22**connecting device**

device for the electrical connection of one (or more) conductor(s), either fixed to a base or forming an integral part of the equipment

349

4 General requirements

350

4.1 Industrial cable reels shall be so designed and constructed that, in normal use, their performance is reliable, and safety is achieved by reducing risk to a tolerable level, as defined in ISO/IEC Guide 51

351

352

353

Unless otherwise stated, the normal use environment in which the cable reels complying with this standard are normally used is pollution degree 3 according to IEC 60664-1.

354

355

If other pollution degrees are needed, creepage distances and clearances shall be in accordance with IEC 60664-1. The comparative tracking index (CTI) value shall be evaluated in accordance with IEC 60112. Test and requirements are specified in 21.1.2.

356

357

358

Cable reels shall have a minimum degree of protection IP24D (see 6.3) according to IEC 60529.

359

360

In general, compliance is checked by carrying out all the tests specified.

361

362 **4.2** Unless otherwise stated, one sample is submitted to all the tests, and the requirements
 363 are satisfied if all the tests are met. The sample is tested as delivered and under normal
 364 conditions of use, at an ambient temperature of (20 ± 5) °C. Tests are carried out in the order
 365 of the clauses of this document.

366 **4.3** If the sample does not satisfy a test due to an assembly or manufacturing fault which is
 367 not representative of the design, that test and any preceding one which may have influenced
 368 the results of the test shall be repeated in the required sequence. Tests which follow shall be
 369 made on another sample, which shall comply with the requirements of this standard.

370 5 Standard ratings

371 The rated current shall not be higher than the maximum rated current of the inlet or of the
 372 portable socket-outlet.

373 Preferred rated currents are given in Table 1:

374 **Table 1 – Preferred rated currents**

| Series I | Series II |
|----------|-----------|
| A | A |
| 16 | 20 |
| 32 | 30 |
| 63 | 60 |

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376 NOTE 1 "Preferred ratings" do not exclude other ratings.

377 NOTE 2 This table does not provide correspondence between series I and series II values.
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378 *Compliance is checked by inspection of the marking.*

379 6 Classification

380 **6.1** Cable reels are classified according to the type of construction:

- 381 – portable cable reels
- 382 – fixed cable reels

383 **6.2** Cable reels are classified according to the method of winding the flexible cable:

- 384 – hand-operated cable reels
- 385 – spring-operated cable reels
- 386 – motor-driven cable reels

387 **6.3** Cable reels are classified according to the degree of protection according to IEC 60529:

- 388 – the minimum degree of protection shall be IP24D.

389 **6.4** Cable reels are classified according to their protection against excessive temperatures:

- 390 – cable reels incorporating thermal-cut-out
- 391 – cable reels incorporating current-cut-out
- 392 – cable reels incorporating both thermal- and current-cut-outs

393 **6.5** Cable reels are classified according to the method of connecting the cable:

- 394 – rewirable cable reels