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Project No. 2022/00327

Responsible committee: PEL/23 Electrical accessories

Interested committees:

Title: BS EN 61995-1 Devices for the connection of luminaires for household and similar purposes

Part 1: General requirements

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

- i) has any issues related to 3rd party IPR, patent or copyright
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- iii) requires additional national guidance or information

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Responsible Committee Secretary: **Mr Simon Bounds (BSI)**Direct tel: **0208 996 7281**E-mail: simon.bounds@bsigroup.com

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



23B/1451/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER:

IEC 61995-1 ED2

DATE OF CIRCULATION:

2023-01-20

CLOSING DATE FOR COMMENTS:

2023-03-17

SUPERSEDES DOCUMENTS:

23B/1375/CD, 23B/1393B/CC

IEC SC 23B : PLUGS, SOCKET-OUTLETS AND SWITCHES

SECRETARIAT:

Italy

SECRETARY:

Mr Cristiano Masini

OF INTEREST TO THE FOLLOWING COMMITTEES:

SC 34D, TC 64

PROPOSED HORIZONTAL STANDARD:



Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.

FUNCTIONS CONCERNED:

☒ EMC

☐ ENVIRONMENT

☐ QUALITY ASSURANCE

☒ SAFETY

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of

- any relevant patent rights of which they are aware and to provide supporting documentation,
- any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "in some countries" clauses. See AC/22/2007.

TITLE:

Devices for the connection of luminaires for household and similar purposes - Part 1: General requirements

NOTE FROM TC/SC OFFICERS:

Subject - Revision of IEC 61995-1 - Proposal to include requirements for additional suspension means, to allow different wiring capacities and to add the option of floating type DCL outlets. In addition, it was agreed to align if needed to IEC60884-1 for relevant clauses.

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DEVICES FOR THE CONNECTION OF LUMINAIRES FOR HOUSEHOLD AND SIMILAR PURPOSES –

Part 1: General requirements

FOREWORD

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This document is create intended for next publication as a new Edition 2.0.

44 International Standard IEC 61995-1 has been prepared by subcommittee 23B: Plugs, socket-
45 outlets and switches, of IEC technical committee 23: Electrical accessories.

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

47 IEC 61995 consists of the following parts, under the general title *Devices for the connection of*
48 *luminaires for household and similar purposes*:

49 Part 1: General requirements

50 Part 2: Standard sheets

51 The committee has decided that the contents of the base publication and its amendment will
52 remain unchanged until the stability date indicated on the IEC web site under
53 "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the
54 publication will be

- 55 • reconfirmed,
- 56 • withdrawn,
- 57 • replaced by a revised edition, or
- 58 • amended.

59

60

DEVICES FOR THE CONNECTION OF LUMINAIRES FOR HOUSEHOLD AND SIMILAR PURPOSES –

Part 1: General requirements

1 Scope

This part of IEC 61995-1 applies to devices for the connection of luminaires (DCL) intended for household and similar purposes, for the electrical connection of fixed luminaires of class I or class II to final circuits rated at not more than 16 A without mechanical support for the luminaires incorporated in the plug/outlet interface. The DCL retention mechanisms are not intended to support the weight of the luminaires.

DCL plugs and outlets have a rated current of 6A.

DCL outlets have an earthing contact.

The rated voltage is 125 V or 250 V at 50/60 Hz.

This document can also be applied to DCL interfaces not complying with IEC 61995-2.

NOTE 1 In the following countries only types with a standardised interface according to IEC 61995-2 are allowed: IT.

DCL can be provided with additional suspension means. These additional suspension means are limited to a maximum mass of 5 kg.

DCL plugs and DCL outlets complying with this standard are suitable for use at ambient temperatures not normally exceeding +40 °C, but their average over a period of 24 h does not exceed +35 °C, with a lower limit of the ambient air temperature of –5 °C.

DCLs are intended for use according to their IP rating as specified in IEC 60529.

This standard gives additional requirements for DCL accessories provided with insulation-piercing terminals, see Annex B (normative).

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 60068-2-31, Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens

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

IEC 60112 Ed. 5: 2020, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60227-5, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V – Part 5: Flexible cables (cords)*

IEC 60417-DB¹⁾, *Graphical symbols for use on equipment*

IEC 60529 Ed 1989 + AMD1: 1999+AMD2: 2013, Degrees of protection provided by enclosures (IP Code)

¹⁾ "DB" refers to the IEC on-line database.

- 100 IEC 60695-2-11:2021, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods –*
101 *Glow-wire flammability test method for end-products*
- 102 IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*
- 103 IEC 61995-2: 202X - *Devices for the connection of luminaires for household and similar*
104 *purposes - Part 2: Standard sheets for DCL*
- 105 ISO/IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards*

106 **3 Terms and definitions**

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

108 Note 1 to entry Where the terms voltage and current are used, they imply r.m.s. values, unless otherwise specified.

109 Note 2 to entry Throughout this standard the word "earthing" is used for "protective earthing".

110 Note 3 to entry The term "accessory" is used as a general term covering DCL plugs and DCL outlets;

111 **3.1**

112 **device for connecting a luminaire DCL**

113 system comprising a DCL outlet and a DCL plug providing a fixed luminaire with electrical
114 connection to and disconnection from a fixed installation

115 Note to entry The designations DCL, DCL outlet or DCL plug, are used when it is necessary to specify particular
116 requirements and test specifications.

117 **3.2**

118 **DCL outlet**

119 device for connecting a luminaire having socket-contacts designed to engage with the pins of
120 a DCL plug and having terminals for the connection of cable

121 **3.3**

122 **DCL plug**

123 device for connecting a luminaire having pins designed to engage with the contacts of a DCL
124 outlet,

125 **3.4**

126 **rewirable DCL plug**

127 DCL plug so constructed that the flexible cable can be replaced

128 **3.5**

129 **non-rewirable DCL plug**

130 DCL plug so constructed that it forms a complete unit with the flexible cable after connection
131 and assembly by the manufacturer of the plug (see also 14.1)

132 **3.6**

133 **moulded-on DCL plug**

134 non-rewirable DCL plug, the manufacture of which is completed by insulating material
135 moulded around pre-assembled component parts and the terminations of the flexible cable

136 **3.7**

137 **rated voltage**

138 the voltage assigned by the manufacturer for a specified operating condition of an accessory
139 [SOURCE: IEC 442-01-03]

140 **3.8**

141 **rated current**

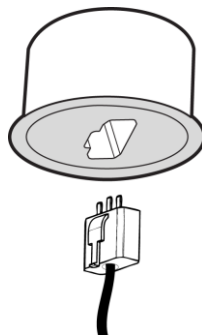
142 the current assigned by the manufacturer for specified operating condition of an accessory

143 [SOURCE: IEC 442-01-02]

144 **3.9**

145 **fixed DCL outlet**

146 DCL outlet intended to be installed at a fixed location and be connected to fixed wiring



147

148 **Figure 1 Example of fixed DCL outlet and plug**

149 **3.10**

150 **mounting box**

151 box in or on a wall or ceiling, etc., for flush or surface application, intended to house a DCL
152 outlet

153 **3.11**

154 **terminal**

155 insulated or non-insulated connecting device intended for reusable electrical connection of the
156 external conductors

157 **3.12**

158 **termination**

159 insulated or non-insulated connecting device intended for non-reusable electrical connection
160 of the external conductors

161 **3.13**

162 **clamping unit**

163 part(s) of the terminal necessary for the mechanical clamping and the electrical connection of
164 the conductor(s), including the parts which are necessary to ensure correct contact pressure
165 [SOURCE: IEC 442-06-12]

166 **3.14**

167 **screw-type terminal**

168 terminal for the connection and subsequent disconnection of one conductor or the
169 interconnection and subsequent disconnection of two or more conductors, the connection
170 being made, directly or indirectly, by means of screws or nuts of any kind

171 Note to entry The terms of definitions 3.14 to 3.17 are examples of screw-type terminals.

172 **3.15**

173 **pillar terminal**

174 screw-type terminal in which the conductor is inserted into a hole or cavity, where it is clamped under
175 the end of the screw or screws

176 Note 1 to entry The clamping pressure may be applied directly by the end of the screw or through an intermediate
177 clamping member to which pressure is applied by the end of the screw

178 **3.16**

179 **stirrup terminal**

180 pillar terminal where the clamping pressure may be applied indirectly by an intermediate clamping
181 member when the screw is tightened

3.17**stud terminal**

screw-type terminal in which the conductor is clamped under a nut

Note 1 to entry The clamping pressure may be applied directly by a suitably shaped nut or through an intermediate part, such as a washer, clamping plate or anti-spread device

3.18**screw-head terminal**

screw-type terminal in which the conductor is clamped under the head of the screw

Note 1 to entry The clamping pressure may be applied directly by a suitably shaped nut or through an intermediate part, such as a washer, clamping plate or anti-spread device

3.19**screwless-type terminal**

connecting device for the connection and subsequent disconnection of a rigid (solid or stranded) or flexible conductor or the interconnection of two or more conductors capable of being dismantled, the connection being made, directly or indirectly, by means of springs, parts of angled, eccentric or conical form, etc., without special preparation of the conductor concerned, other than removal of insulation

3.20**thread-forming screw**

screw having an uninterrupted thread, which by screwing in, forms a thread by displacing material

Note to entry An example of a thread-forming screw is shown in Figure 2.

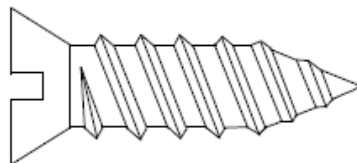
*IEC 1317/02*

Figure 2 – Example of thread-forming screw

3.21**thread-cutting screw**

screw having an uninterrupted thread, which by screwing in, forms a thread by removing material

Note to entry An example of a thread-cutting screw is shown in Figure 3.

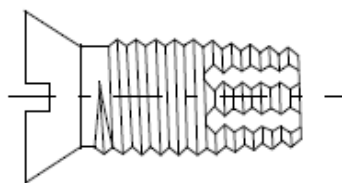
*IEC 1318/02*

Figure 3 – Example of thread-cutting screw

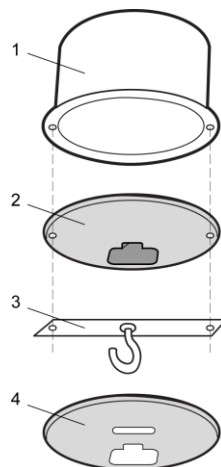
3.22**loop terminal**

supply terminal intended for the interconnection of live conductors

3.23**DCL temporary lampholder**

independent lampholder integral with a DCL plug, designed in order to be temporarily connected to a DCL outlet

219 **3.24**
 220 **additional suspension means**
 221 means comprising any necessary component (hooks, brackets, etc) which is a part of the
 222 DCL, used to fix the luminaire



223 **Key**

- 224 1 Mounting box (flush-type or surface-type)
 225 2 Fixed DCL outlet
 226 3 Additional suspension means
 227 4 Cover-plate

229 **Figure 4 – Example of additional suspension means**

230
 231 **3.25**
 232 **base**
 233 part of the DCL outlet supporting the outlet contacts

234 **3.26**
 235 **live parts**
 236 conductor or conductive part intended to be energized in normal use, including a neutral conductor,
 237 but by convention, not a PEN conductor

238 [SOURCE: IEC 826-12-08]

239 **3.27**
 240 **cord anchorage**
 241 part of an accessory which has the ability to limit the displacement of a fitted flexible cable against pull,
 242 push and turning forces

243 **3.28**
 244 **main part**
 245 assembly consisting of the base and other parts

246 Note to entry This assembly is not intended to be dismantled at any time after manufacture

247 **3.29**
 248 **protective earthing**
 249 **protective grounding (US)**
 250 earthing a point or points in a system or in an installation or in equipment, for purposes of electrical
 251 safety
 252 [SOURCE: IEC 195-01-11]

253 **3.30**

254 **type test**

255 test of one or more devices made to a certain design to show that the design meets certain
256 specifications

257 **3.31**

258 **floating type DCL outlet**

259 a DCL outlet not intended to be fixed to a mounting box

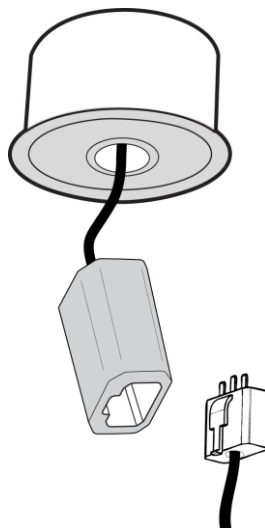


Figure 5 Example of floating type DCL outlet

263 **3.32**

264 **stroke**

265 insertion or withdrawal of the DCL plug

266 **4 General requirements**

267 DCL systems shall be so designed and constructed that in normal use their performance is
268 reliable, and safety is achieved by reducing risk to a tolerable level, as defined in ISO/IEC Guide 51.

269 *Compliance is checked by meeting all the relevant requirements and tests specified.*

270 **5 General remarks on tests**

271 **5.1 General**

272 Tests shall be made to prove compliance with the requirements laid down in this standard, where
273 applicable

274 Tests according to this standard are type tests.

275 **5.2 Products arrangement during test**

276 Unless otherwise specified, the specimens are tested as delivered and under normal
277 conditions of use.

278 Non-rewirable DCL plugs and non-rewireable DCL outlets are tested with the type and size of
279 flexible cable as delivered.

280 DCL plugs and DCL outlets are tested separately, unless otherwise specified.

281 *The neutral is treated as a pole.*

282 *Flush and semi-flush type DCL-outlets shall be tested, if appropriate, when installed in a box*
 283 *complying with the applicable standard sheet(s), if any. In case the DCL-outlet is manufactured for a*
 284 *specific box, the tests shall be conducted when the DCL-outlet is installed in the corresponding box as*
 285 *specified by the manufacturer.*

286 **5.3 Ambient test condition**

287 Unless otherwise specified, the tests are carried out in the order of the clauses, at an ambient
 288 temperature between 15 °C and 35 °C.

289 It is recommended that the tests are made at an ambient temperature of (20 ± 5) °C.

290 **5.4 Specimens needed for the tests**

291 *Unless otherwise specified, three specimens are subjected to all the relevant tests.*

292 The number of specimens required for the tests shall be as specified in Table 1.

293 **Table 1– Number of specimens needed for the tests**

Clauses and subclauses		Number of specimens	
		DCL outlet	DCL plug
6	Ratings	A	A
7	Classification	A	A
8	Marking	A	A
9	Checking of dimensions	ABC	ABC
10	Protection against electric shock	ABC	ABC
11	Provision for earthing	ABC	ABC
12	Terminals and terminations	ABC ^{a b}	ABC ^a
13	Construction of DCL outlets	ABC	ABC
14	Construction of DCL Plugs	ABC	ABC
15	Resistance to ageing, to harmful ingres of water and to humidity	ABC	ABC
16	Insulation resistance and electric strength	ABC	ABC
17	Particular requirements for DCL incorporating components to perform additional functions	ABC	ABC
18	Making and breaking capacity	ABC	ABC
19	Temperature rise	ABC	ABC
20	Force necessary to insert and withdraw the plug	A ^c	A ^c
21	Flexible cables and their connection	–	ABC ^d
22	Mechanical strength	ABC ^e	ABC
23	Resistance to heat	ABC ^f	ABC ^f
24	Screws, current-carrying parts and connections	ABC	ABC
25	Creepage distances, clearances and distances through sealing compound	ABC	ABC
26	Resistance of insulating material to abnormal heat, to fire and to tracking	DEF ^g	DEF ^g
27	Resistance to rusting	DEF	DEF
^a Five extra screwless-type terminals are used for the test of 12.3.10. ^b Three extra specimens of DCL outlets are used for the test of 12.3.11. ^c One extra specimen of DCL plug and DCL outlet are used for the test of 20.			

^d Three extra specimens of non-rewirable DCL plugs are used for the test of 21.2.

^e Three extra specimens of DCL outlets are used for the tests of 22.3.1 and 22.3.2.

^f Three extra specimens of DCL may be used for the tests of 23.2 and 23.3.

^g Three extra specimens of DCL may be used for the tests of 26.2.

294

295 5.5 General requirement for conformity assessment

296 *The specimens are submitted to all the relevant tests and the requirements are satisfied if all*
297 *these tests are met.*

298 *If one specimen does not satisfy a test due to an assembly or manufacturing fault, that test*
299 *and any preceding one which may have influenced the results of the test shall be repeated*
300 *and also the tests which follow shall be made in the required sequence on another full set of*
301 *specimens, all of which shall comply with the requirements.*

302 NOTE The applicant may submit, together with the number of specimens specified in 5.4, an additional set of
303 specimens which may be required, should one specimen fail. The testing station will then, without further request,
304 test the additional specimens and will only reject them if a further failure occurs. If the additional set of specimens
305 is not submitted at the same time, the failure of one specimen will entail rejection.

306 6 Ratings

307 DCL plugs and DCL outlets shall have a rated voltage of 125 V AC or 250 V AC and a rated
308 current of 6 A.

309 The rated voltage of the DCL incorporating components can be selected by the manufacturer
310 according to the nominal voltage of the fixed electrical installation where the accessory is intended to
311 be installed or used.

312 NOTE The nominal voltages are defined in IEC 60038

313 *Compliance is checked by inspection of the marking and by the tests described in this*
314 *standard.*

315 7 Classification

316 7.1 DCL accessories classification

317 7.1.1 DCLs are classified according to their interface design:

318 7.1.1.1 complying with part 2 of this standard;

319 7.1.1.2 other types (not complying with part 2 of this standard).

320 7.1.2 according to the type of terminals:

321 7.1.2.1 DCL accessories with screw-type terminals

322 7.1.2.2 DCL accessories with screwless-type terminals

323 7.1.2.3 DCL accessories with Insulation Piercing Terminals (IPT)

324 7.1.3 Classification according to the type of conductors to be connected:

325 7.1.3.1 rigid (both solid and stranded) conductors only

326 7.1.3.2 rigid (both solid and stranded) and flexible conductors.

327 NOTE: Only DCL plugs for connection of flexible cables are allowed in DK.

328

329 **7.2 DCL outlets classification**

330 **7.2.1 according to the method of application:**

331 7.2.1.1 fixed DCL outlet;

332 7.2.1.2 floating type DCL outlet;

333

334 **7.2.2 according to the connection capacities of the DCL outlet terminals:**

335 7.2.2.1 DCL outlets with a connection capacity up and including 1,5 mm²;

336 7.2.2.2 DCL outlets with a connection capacity up and including 2,5 mm²;

337 **7.2.3 according to the provision of a loop terminal:**

338 7.2.3.1 DCL outlets with a loop terminal

339 7.2.3.2 DCL outlets without a loop terminal

340

341 **7.2.4 according to the method of mounting as a consequence of design:**

342 7.2.4.1 design A – DCL outlets where the cover or cover-plate or parts of them can be
343 removed without displacement of the conductors

344 7.2.4.2 design B – DCL outlets where the cover or cover-plate or parts of them cannot be
345 removed without displacement of the conductors.

346 NOTE If a DCL outlet has a base (main part) which cannot be separated from the cover or cover-plate and
347 requires a supplementary plate which can be removed for redecorating the wall or ceiling without displacement of
348 the conductors, it is considered to be of design A, provided the supplementary plate meets the requirements
349 specified for covers and cover-plates.

350 **7.2.5 DCL outlets are classified according to the provisions for suspension means:**

351 7.2.5.1 without additional suspension means for supporting the luminaires;

352 7.2.5.2 with additional suspension means for supporting the luminaires, fixed to a mounting
353 box

354 7.2.5.3 with additional suspension means for supporting the luminaires, fixed to the building
355 construction.

356 **7.3 DCL plugs classification:**

357 **7.3.1 according to the method of connecting the cable:**

358 7.3.1.1 rewirable DCL plugs;

359 7.3.1.2 non-rewirable DCL plugs;

360 **7.3.2 according to the class of luminaire to which they are intended to be connected:**

361 7.3.2.1 DCL plugs for fixed luminaires of Class I;

362 7.3.2.2 DCL plugs for fixed luminaires of Class II;

363 NOTE For the description of the classes of equipment, see IEC 61140 (Protection against Electric Shock –
364 Common aspects for installation and equipment).

7.4 according to the IP degree of protection per IEC 60529;

8 Marking

8.1 General

8.1.1 DCL Outlet markings

DCL outlets shall be marked with the following information:

- rated current;
- rated voltage;
- symbol for alternating current;
- name or trademark of the manufacturer or responsible vendor;
- terminal identification (see 8.3);
- symbol indicating that the outlet is only to be used with luminaires, that shall be visible after installation but not necessarily after insertion of the DCL plug.
- for DCL outlets classified according to 7.2.5.2 or 7.2.5.3: The maximum mass to be suspended to the suspension mean in kg, that shall be visible after installation as for normal use but not necessarily after mounting the luminaires.

In addition DCL outlets with screwless-type terminals shall be marked with:

- an appropriate marking indicating the length of insulation to be removed before the insertion of the conductor in the screwless-type terminal;
- an indication of the suitability to accept rigid conductors only (“r”) for those DCL outlets having this restriction. (see also 12.3.1).

DCL outlets having terminals with a connection capacity of less than 2,5 mm² shall be marked with:

- 1,5 mm² Max

The additional markings shall be put on the DCL outlet. In addition, they can be given on the packaging unit and/or in an instruction sheet which accompanies the DCL outlet.

NOTE The manufacturer should explain the marking “r” in the instruction sheet (r - use rigid conductors only).

8.1.2 DCL Plugs marking

DCL plugs shall be marked with the following information:

- rated current;
- rated voltage;
- symbol for alternating current;
- name or trademark of the manufacturer or responsible vendor;
- terminal identification (see 8.3);
- symbol indicating the plug is only for use with luminaires, that shall be visible after fitting the flexible cable but not necessarily after insertion into the DCL outlet.

In addition, DCL plugs with screwless-type terminals shall be marked with:

- an appropriate marking indicating the length of insulation to be removed before the insertion of the conductor in the screwless-type terminal

The additional markings shall be put either on the DCL plug or on the packaging unit, and/or given in an instruction sheet which accompanies the DCL plug.

8.2 Symbols

Where symbols are used, they shall be as follows:

– amperes	A
– volts	V
– nature of supply (symbol IEC 60417- 5032)	~
– line	L
– neutral	N
– mass	kg
– Terminal capacity	mm ²

– protective earth (symbol IEC60417- 5019)



– symbol for use with luminaires only (symbol IEC60417-5974)



For the marking with rated current and rated voltage the figures may be used alone. These figures shall be placed on one line separated by an oblique line or the figure for rated current shall be placed above the figure for rated voltage, separated by a horizontal line. The marking for the nature of supply shall be placed next to the marking for rated current and rated voltage.

NOTE 1 Lines formed by the construction of the tool are not considered as part of the marking.

NOTE 2 Details of construction of symbols are given in IEC 60417.

NOTE 3 The marking for current, voltage and nature of supply may be, for example, as follows:

6 A 250 V~ or 6/250~ or $\frac{6}{250}$ ~

8.3 Particular requirements for markings on terminals other than phase terminals

Terminals intended exclusively for the neutral conductor shall be indicated by the letter N.

Earthing terminals shall be indicated by the symbol for protective earth.

These markings shall not be placed on screws, or any other easily removable parts.

NOTE "Easily removable parts" are those parts which can be removed during the normal installation of the DCL outlet or the assembly of the DCL plug.

Terminations of non-rewirable DCL plugs need not be marked.

8.4 User information

8.4.1 General

DCL outlets and DCL plugs shall be provided with information warning the user that these products are intended only for the connection of fixed luminaires.

Where it is necessary for safe operation that the user be aware of any particular characteristics of the DCL plug or DCL outlet, the necessary information shall be given.

The instructions and information referred to in this subclause shall be given by marking the DCL plug or DCL outlet itself, or where this is not practicable, in an instruction sheet accompanying the DCL.

8.4.2 Information to be given by the manufacturer instructions

Manufacturer shall provide instructions for the proper fixing, installation and intended use of the additional suspension means classified according to 7.2.5.2 or 7.2.5.3, in particular the maximum mass to be suspended, the type of mounting box to be used and the type of surface and material on which it is intended to be used.

NOTE: General requirements for boxes and enclosures can be found in IEC 60670-1 and particular requirements for boxes and enclosures with provision for suspension means in IEC 60670-21.

8.5 Durability

Markings shall be durable and easily legible.

Laser marking directly on the product and marking made by moulding, pressing or engraving are not subjected to this test.

Compliance is checked by inspection, using normal or corrected vision, without additional magnification and, if necessary, by the following test.

The test is made by rubbing the marking for 15 s with a piece of cotton cloth soaked with water and again for 15 s with a piece of cotton cloth soaked with n-hexane 95 % (Chemical Abstracts Service Registry Number, CAS RN, 110-54-3).

NOTE n-hexane 95 % (Chemical Abstracts Service Registry Number, CAS RN, 110-54-3) is available from a variety of chemical suppliers as a high pressure liquid chromatography (HPLC) solvent.

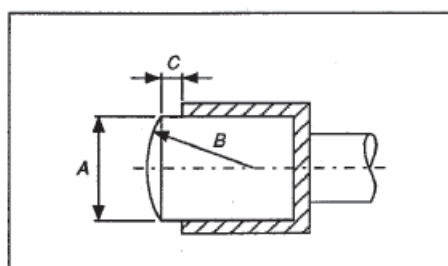
When using the liquid specified for the test, precautions as stated in the relative material safety datasheet provided by the chemical supplier shall be taken to safeguard the laboratory technicians.

The marking surface to be tested shall be dried after the test with water.

Rubbing shall commence immediately after soaking the piece of cotton, applying a compression force of (5 ± 1) N at a rate of about one cycle per second (a cycle comprising a forward and backward movement along the length of the marking). For markings longer than 20 mm, rubbing can be limited to a part of the marking, over a path of at least 20 mm length.

The compression force is applied by means of a test piston which is wrapped with cotton comprising cotton wool covered by a piece of cotton medical gauze.

The test piston shall have the dimensions specified in Figure 6 and shall be made of an elastic material which is inert against the test liquids and has a Shore-A hardness of 47 ± 5 (for example synthetic rubber).



Dimensions [mm]			
	A	B	C
Dimensions	20	20	2
Tolerance	+2, -0	±0,5	+1, -0

Figure 6 – Test piston dimensions

When it is not possible to carry out the test on the specimens due to the shape/size of the product or the marking is not accessible with the test piston:

- a suitable piece having the same characteristics as the product can be submitted to the test or
- another test piston with different shape can be used on the condition that radius B is kept.

490

491 **9 Checking of dimensions**

492 **9.1 General**

493 DCL types classified according to 7.1.1.1 shall comply with the relevant standard sheets of
494 the part 2.

495 *Compliance is checked by measurement and/or by means of gauges.*

496 **9.2 Dangerous compatibility**

497 DCL types classified according to 7.1.1.2 as other types shall comply with the relevant
498 specification and shall not be interchangeable with or create a hazardous situation with DCL
499 types complying with the standard sheets of part 2.

500 *Compliance is checked by measurement and/or by means of gauges.*

501 **10 Protection against electric shock**

502 Accessories shall ensure protection against electric shock.

503 Lacquer, enamel or sprayed insulating coating is not deemed to be insulating material for the
504 purpose of 10.1 to 10.4.

505

506 **10.1 Accessibility of live parts during normal use**

507 DCL outlets shall be so designed that, when they are wired and mounted as for normal use,
508 live parts are not accessible, even after removal of parts which can be removed without the
509 use of a tool.

510 Live parts of DCL plugs shall not be accessible when the DCL plug is in partial or complete
511 engagement with a DCL outlet.

512 *Compliance is checked by inspection and, if necessary, by the following test:*

513 *The specimen is mounted as for normal use and fitted with conductors of the smallest cross-*
514 *sectional areas and the test is then repeated using conductors of the largest cross-sectional*
515 *areas, as specified in Table 2.*

516 *For DCL outlets, the test finger specified in IEC 61032 test probe B is applied in every*
517 *possible position.*

518 *For DCL plugs, the test finger is applied in every possible position when the plug is in partial*
519 *or complete engagement with a DCL outlet.*

520 *An electrical indicator with a voltage of (45 ± 5) V, is used to show contact with the relevant*
521 *part.*

522 *For DCL systems where the use of elastomeric or thermoplastic material is likely to influence*
523 *the requirement, the test is repeated but at an ambient temperature of (35 ± 2) °C, the DCLs*
524 *being at this temperature.*

525 *During this additional test the DCLs are subjected for 1 min to a force of 75 N, applied through*
526 *the tip of a straight unjointed test finger of the same dimensions as the standard test finger.*
527 *This finger, with an electrical indicator as described above, is applied to all places where*
528 *yielding of the insulating material could impair the safety of the accessory, and it is applied to*
529 *thin walled knock-outs with a force of 10 N.*

530 *During this test, the DCL, with its associated mounting means, shall not deform to such an*
531 *extent that those dimensions shown in the relevant standard sheets which ensure safety are*
532 *unduly altered and no live part shall be accessible.*

533 **10.2 Requirements for accessible parts of accessory during normal use**

534 Parts which are accessible when the DCL is wired and mounted as for normal use,
535 with exception of small screws and the like, isolated from live parts, for fixing bases and
536 covers or cover plates of DCL outlets, shall be made of insulating material; however the
537 covers or cover-plates of DCL outlets may be made of metal if the requirements given in
538 10.2.1 or 10.2.2 are fulfilled.

539 10.2.1 The covers or cover-plates of metal shall be protected by supplementary insulation
540 made by insulating linings or insulating barriers fixed to covers or cover-plates or to the body
541 of the DCL, in such a way that the insulating linings or insulating barriers:

- 542 – either cannot be removed without being permanently damaged,
- 543 – or are so designed that:
 - 544 – they cannot be replaced in an incorrect position;
 - 545 – if they are omitted, the DCLs are rendered inoperable or manifestly incomplete;
 - 546 – there is no risk of accidental contact between live parts and metal covers or cover-
 - 547 plates, for example through their fixing screws, even if a conductor should come away
 - 548 from its terminal;
- 549 – precautions are taken in order to prevent creepage distances or clearances becoming
- 550 less than the values specified in Clause 25.

551 *Compliance is checked by inspection.*

552 The above linings or barriers shall comply with the tests of Clauses 16 and 25.

553 NOTE Insulating coating sprayed on the inside or on the outside of the metal covers or cover plates is not
554 deemed to be an insulating lining or barrier for the purpose of this requirement.

555 10.2.2 The metal covers or cover-plates shall be securely connected, through a low
556 resistance connection, to the earth during fixing of the cover or the cover-plate itself.

557 NOTE 1 Fixing screws of metal covers, cover-plates or other means are allowed.

558 The creepage distances and the clearances between the live pins of a DCL plug when fully
559 inserted and the earthed metal cover of a DCL outlet shall comply with items 2 and 7 of Table
560 16 respectively.

561 *Compliance is checked by inspection and by the test of 11.4.*

562 NOTE 2 Due to the lack of an earthing conductor in many existing old buildings, accessories requiring earth
563 connection cannot normally be used in the following countries: DK.

564 **10.3 Single pole insertion**

565 It shall not be possible to make connection between a pin of a DCL plug and a live contact of
566 a DCL outlet while any other pin is accessible.

567 *Compliance is checked by manual test using a DCL outlet with corresponding DCL plug and*
568 *test finger specified in IEC 61032 test probe B in a manner most likely to make contact with*

569 *live parts. In applying the test a supply of (45 ± 5) V, in series with a suitable indicating lamp,*
570 *shall be connected between the test finger and the relevant conducting parts of the DCL plug*
571 *and/or DCL outlet.*

572 For DCLs with enclosures or bodies of thermoplastic material, the test is made at an ambient
573 temperature of (35 ± 2) °C, both the DCL and the gauge being at this temperature.

574 For DCL outlets provided with metal covers or cover plates, a clearance, between a pin and a
575 socket-contact, of at least 2 mm is required, when another pin, or pins, is (are) in contact with
576 the metal covers or cover-plates.

577 **10.4 External parts of DCL plugs**

578 External parts of DCL plugs, with the exception of assembly screws and the like, current-
579 carrying and earthing pins, earthing straps and metal rings around pins, shall be of insulating
580 material. Covers of DCL plugs may be of metal provided they comply with the requirements of
581 10.2.1 or 10.2.2.

582 **10.5 Conductive parts of additional suspension means**

583 Conductive parts of additional suspension means inside the box or enclosure shall be

584 – protected by a layer of insulating material which complies with the tests for insulating linings
585 according to 10.2.1, or

586 – located such that it will not come in contact with electrical conductors or live parts, or

587 – reliably connected to the earthing means complying with requirements of 11.4 when fitted as
588 for normal use.

589 *Compliance is checked by inspection.*

590 **11 Provision for earthing**

591 **11.1 General**

592 DCLs with earthing contact shall be so constructed that, when inserting the DCL plug, the
593 earth connection is made before the current-carrying contacts of the DCL plug become live.

594 When withdrawing the DCL plug, the current-carrying pins shall not remain live after the earth
595 connection is broken.

596 *Compliance is checked by inspection and by measurement.*

597 **11.2 Earthing terminals**

598 Earthing terminals of rewirable DCLs shall allow the proper connection of copper conductors
599 in accordance with the relevant requirements of Clause 12.

600 **11.3 Accessible metal parts**

601 Accessible metal parts of DCL outlets, which may become live in the event of an insulation
602 fault, shall be permanently and reliably connected to the earthing terminal.

603 This requirement does not apply to the metal cover or cover-plates complying with 10.2.1 or
604 conductive parts of suspension means insulated as specified in 10.5.

605 For the purpose of this requirement, small screws and the like, isolated from live parts, for
606 fixing bases, covers or cover-plates, are not considered as accessible parts which may
607 become live in the event of an insulation fault.

608 *Compliance with the requirements of 11.2 and 11.3 is checked by inspection and by the*
609 *relevant tests of Clause 12*

610 **11.4 Internal connection with the earthing terminal**

611 The connection between the earthing terminal and accessible metal parts to be connected
612 thereto shall be of low resistance.

613 *Compliance is checked by the following test after the tests of Clauses 18 and 19:*

614 *A current derived from an AC source having a no-load voltage not exceeding 12 V and equal*
615 *to 1,5 times rated current is passed between the earthing terminal and each of the accessible*
616 *metal parts in turn, and for DCLs with earthing contacts between the DCL outlet earthing*
617 *terminal and the DCL plug earthing terminal.*

618 *The voltage drop between the earthing terminal and the accessible metal part is measured*
619 *and the resistance is calculated from the current and this voltage drop.*

620 *In no case shall the resistance exceed 0,05 Ω .*

621 NOTE Care should be taken that the contact resistance between the tip of the measuring probe and the metal part
622 under test does not influence the test result.

623 **12 Terminals and terminations**

624 **12.1 General**

625 All the tests on terminals, with the exception of the test of 12.3.9, shall be made after the test
626 of 15.1.

627 DCL outlets and rewirable DCL plugs shall be provided with screw-type terminals or with
628 screwless-type terminals which allow the proper connection of copper conductors having
629 cross sectional area as shown in Table 2.

630 If pre-soldered flexible conductors are used, care shall be taken that in screw-type terminals
631 the pre-soldered area shall be outside the squeezed area when connected as for normal use.

632 The means for clamping the conductors in the terminals shall not serve to fix any other
633 component, although they may hold the terminals in place or prevent them from turning.

634 Non-rewirable DCL plugs and non-rewireable DCL outlets shall be provided with soldered,
635 welded, crimped or equally effective permanent connections for copper conductors as shown
636 in Table 2; screwed or snap-on connections shall not be used.

637 Connections made by crimping a pre-soldered flexible conductor are not permitted, unless the
638 soldered area is outside the crimping area.

639 Compliance is checked by inspection and the following tests.

12.2 Terminals with screw clamping for external copper conductors

12.2.1 Screw-type terminals shall allow the conductor to be connected without special preparation having a nominal cross-sectional areas as shown in Table 2.

Table 2 – Connection of copper conductors

Accessory	Connection capacity mm ²	Conductor cross-sectional area mm ²	Diameter of the largest conductor	
			Rigid (solid or stranded) mm	Flexible copper mm
DCL outlet according to 7.2.3.1, with a loop terminal	up and including 1,5	From 1 × 1,0 up and including 2 × 1,5	1,45	1,73
	up and including 2,5	From 1 × 1,0 up and including 2 × 2,5	2,13	2,21
DCL outlet according to 7.2.3.2, without a loop terminal	up and including 1,5	From 1 × 1,0 up and including 1 × 1,5	1,45	1,73
	up and including 2,5	From 1 × 1,0 up and including 1 × 2,5	2,13	2,21
Floating type DCL outlet according to 7.2.3.2 without looping terminals	-	From 1 × 0,5 up and including 1 × 1,5	1,45	1,73
DCL plug	-	From 1 × 0,5 up and including 1 × 1,5	-	1,73
NOTE 1 In the following countries, only loop terminals able to connect 3 × 2,5 mm ² conductors are allowed: GB.				

Compliance is checked by inspection and by fitting conductors of the smallest and largest nominal cross-sectional areas specified according to the classification 7.2.2.

12.2.2 Terminals with screw clamping shall allow the conductor to be connected without special preparation.

Compliance is checked by inspection.

NOTE The term "special preparation" covers soldering of the wires of the conductor, use of cable lugs, formation of eyelets, etc., but not the reshaping of the conductor before its introduction into the terminal or the twisting of a flexible conductor to consolidate the end.

12.2.3 Screw-type terminals shall have adequate mechanical strength.

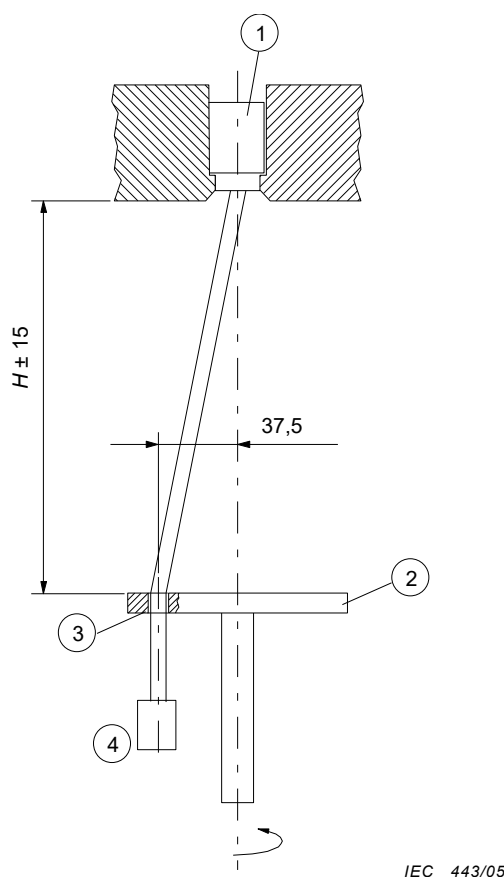
Screws and nuts for clamping the conductors shall have a metric ISO thread or a thread comparable in pitch and mechanical strength.

Screws shall not be of metal which is soft or liable to creep, such as zinc or aluminium.

Compliance is checked by inspection and by the tests of 12.2.5 and 12.2.7.

NOTE Provisionally, SI, BA and UN threads are considered to be comparable in pitch and mechanical strength to metric ISO thread.

- 663 12.2.4 Screw-type terminals shall be resistant to corrosion.
- 664 Terminals, the body of which is made of copper or of a copper alloy as specified in 24.5 are
665 considered as complying with this requirement.
- 666 12.2.5 Screw-type terminals shall be so designed that they clamp the conductor(s) without
667 unduly damaging it(them).
- 668 *Compliance is checked by the following test:*
- 669 *The terminals are fitted with new conductors of the type and of the minimum and maximum*
670 *cross-sectional areas specified in Table 2 according to the classification 7.2.2 and tested in the*
671 *equipment shown in Figure 7:*
- 672 – firstly with conductors of the minimum cross-sectional area;
673 – secondly with conductors of the maximum cross-sectional area.



Dimensions in millimetres

- 676 (1) Terminal
677 (2) Platen
678 (3) Bushing^a
679 (4) Mass

681 ^a Care should be taken that the bushing hole is made in a way which ensures that the force exerted on the cable is
682 pure pulling force and that the transmission of any torque to the connection in the clamping means is avoided.

Figure 7 – Arrangement for checking damage to conductors

685 *The length of the test conductor shall be 75 mm longer than the height (H) specified in*
 686 *Table 3.*

687 *The test conductor is then connected to the clamping unit, the clamping screws or nuts are*
 688 *tightened with the torque according to Table 6.*

689 *Each of the conductors is subjected to the following test:*

690 *The end of one conductor is passed through an appropriate sized bushing in a platen*
 691 *positioned at a height (H) below the equipment as given in Table 3. The bushing is positioned*
 692 *in a horizontal plane such that its centre line describes a circle of 75 mm diameter, concentric*
 693 *with the centre of the clamping unit in the horizontal (plane); the platen is then rotated at a*
 694 *rate of (10 ± 2) r/min.*

695 *The distance between the mouth of the clamping unit and the upper surface of the bushing*
 696 *shall be within ± 15 mm of the height in Table 3. The bushing may be lubricated to prevent*
 697 *binding, twisting or rotation of the insulated conductor.*

698 *A mass as specified in Table 3 is suspended from the end of the conductor. The duration of*
 699 *the test is 15 min.*

700 *During the test, the conductor shall neither slip out of the clamping unit nor break near the*
 701 *clamping unit, nor shall the conductor be damaged in such a way as to render it unfit for*
 702 *further use.*

703 The test shall be repeated with new samples with rigid solid and or flexible conductors where they
 704 exist, if the first test has been made with rigid stranded conductors.

705 In the case of the flexible conductor, the breakage of a few wires shall not be taken into account
 706 provided it does not exceed 15 % of the original number of wires.

707 **Table 3– Values for checking damage to conductors**

Conductor cross-sectional area mm²	Diameter of bushing hole ^a mm	Height mm	Mass for conductor kg
0,5	6,5	260	0,3
0,75	6,5	260	0,4
1,0	6,5	260	0,4
1,5	6,5	260	0,4
2,5	9,5	280	0,7
^a If the bushing hole diameter is not large enough to accommodate the conductor without binding, a bushing having the next larger hole size may be used.			

708

709 12.2.6 Screw-type terminals shall be so designed that they clamp the conductor reliably and
 710 between metal surfaces.

711 *Compliance is checked by inspection and by the following test:*

712 *The terminals are fitted with new conductors of the type and of the minimum and maximum*
 713 *cross-sectional area according to Table 2.*

714 *Screws are tightened with a torque equal to two-thirds of the torque shown in the appropriate*
 715 *column of Table 6.*