



SLOVENSKI STANDARD
oSIST prEN IEC 62031:2024
01-junij-2024

Moduli LED - Varnostne zahteve

LED modules - Safety requirements

Ta slovenski standard je istoveten z: **prEN IEC 62031:2024**

ICS:

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oSIST prEN IEC 62031:2024

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34A/2390/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

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| OF INTEREST TO THE FOLLOWING COMMITTEES: TC 34, SC 34B, SC 34C, SC 34D | 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 checked="" type="checkbox"/> SAFETY | |
| <input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING Attention IEC-CENELEC parallel voting 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. The CENELEC members are invited to vote through the CENELEC online voting system. | <input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING |

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TITLE:

LED modules - Safety requirements

PROPOSED STABILITY DATE: 2028

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LED MODULES – SAFETY REQUIREMENTS

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FOREWORD

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147 all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international
148 co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and
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178 IEC 62031 ED3 has been prepared by subcommittee 34A: Electric light sources, of IEC
179 technical committee 34: Lighting. It is an International Standard.

180 This third edition cancels and replaces the second edition IEC 62031:2018. This edition
181 constitutes a technical revision.

182 This edition includes the following significant technical changes with respect to the documents
183 it cancels and replaces:

184 a) Complete review of the document structure, detailed technical requirements and tests,
185 including but not limited to what is individually described under items b) to i);

186 b) Clarification of the scope and revision of the applicability of this document to independent
187 and integral LED modules;

188 c) Updated terms and definitions;

189 d) Clearer specification for clause general requirements and clause general test requirements;

190 e) Update of the marking clause, such as marking of control terminals;

191 f) A full review and update of the electrical safety, thermal safety, and mechanical safety
192 requirements preventing misinterpretation and ambiguity;

193 g) Updated photobiological safety requirements;

194 h) Revised and updated fault conditions and abnormal conditions requirements.

195 i) Removal of the annex relating to conformity testing during manufacture.

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

| Draft | Report on voting |
|-------------|------------------|
| 34A/XX/FDIS | 34A/XX/RVD |

197

198 Full information on the voting for its approval can be found in the report on voting indicated in
199 the above table.

200 The language used for the development of this International Standard is English.

201 This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in
202 accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available
203 at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are
204 described in greater detail at www.iec.ch/standardsdev/publications.

205 NOTE In this document, the following print type is used:

206 – compliance statements: *in italic type*.

207 The committee has decided that the contents of this document will remain unchanged until the
208 stability date indicated on the IEC website under webstore.iec.ch in the data related to the
209 specific document. At this date, the document will be

- 210 • reconfirmed,
- 211 • withdrawn,
- 212 • replaced by a revised edition, or
- 213 • amended.

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LED MODULES – SAFETY REQUIREMENTS

220 **1 Scope**

221 This document specifies safety requirements for LED modules for operation at supply of a DC
222 supply of up to 1 500 V or an AC supply up to 1 000 V. This document does not include
223 requirements for performance characteristics of LED light sources.

224 NOTE 1 LED light sources as defined in IEC 60050-845:2020, 845-27-053 can take the form of an LED module or
225 an LED lamp.

226 This document does not apply to:

- 227 – LED packages;
- 228 – LED light sources for automotive lighting;
- 229 – OLED light sources;

230 NOTE 2 Independent LED modules (see IEC 60050, 845-27-064) are considered luminaires with integral LED
231 module(s) and are covered by the IEC 60598 series.

232 NOTE 3 LED modules that are an integral component of the luminaire are covered by the requirements within IEC
233 60598-1:XXXX, Clause 4.3.1, referencing this document as far as applicable.

234 NOTE 4 Where the word "LED module" is used in this document, it is understood to be "built-in LED module" as
235 defined in IEC 60050-845:2020, 845-27-062."

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237 **2 Normative references**

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

242 IEC 60384-14, *Fixed capacitors for use in electronic equipment – Part 14: Sectional*
243 *specification – Fixed capacitors for electromagnetic interference suppression and connection*
244 *to the supply mains*

245 IEC 60417, *Graphical symbols for use on equipment (available from: [http://www.graphical-](http://www.graphical-symbols.info/equipment)*
246 *symbols.info/equipment)*

247 IEC 60598 (all parts), *Luminaires*

248 IEC 60598-1:2020, *Luminaires – Part 1: General requirements and tests*

249 IEC 60695-2-10, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-*
250 *wire apparatus and common test procedure*

251 IEC 60695-2-11:2021, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods –*
252 *Glow-wire flammability test method for end products (GWEPT)*

253 IEC 60990:2016, *Methods of measurement of touch current and protective conductor current*

254 IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

255 IEC 61347-1:202X, *Controlgear for electric light sources – Safety, Part 1: General requirements*

256 IEC 62471-7:2023, *Photobiological safety of lamps and lamp systems*

257 ISO 4046-4:2016, *Paper, board, pulp and related terms – Vocabulary – Part 4: Paper and board*
258 *grades and converted products*

259 ISO 7089:2000, *Plain washers – Normal series – Product grade A*

260 **3 Terms and definitions**

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

262 ISO and IEC maintain terminological databases for use in standardization at the following
263 addresses: [http://www.iso.org/obp](http://www.iso.org/obp/ui/#iso:code:37101:01)
<https://standards.itec.ai/catalog/standards/sist/f886bcef-2a1a-4162-8c7d-afc99f364d33/osist-pren-iec-62031-2024>

264 – IEC Electropedia: available at <http://www.electropedia.org/>

265 – ISO Online browsing platform: available at <http://www.iso.org/obp>

266 **3.1**

267 **ultraviolet hazard efficacy of luminous radiation**

268 $K_{S,v}$

269 quotient of an ultraviolet hazard quantity by the corresponding photometric quantity

270 Note 1 to entry: Ultraviolet hazard efficacy of luminous radiation is expressed in mW/klm.

271 Note 2 to entry: The ultraviolet hazard efficacy of luminous radiation is obtained by weighting the spectral power
272 distribution of the lamp or LED module with the UV hazard function $S_{UV}(\lambda)$. Information about the relevant UV hazard
273 function is given in IEC 62471:2006. It only relates to possible hazards regarding UV exposure of human beings. It
274 does not deal with the possible influence of optical radiation on materials, such as mechanical damage or
275 discoloration.

276 **3.2**

277 **replaceable LED module**

278 LED module designed to be replaced by an ordinary person or a qualified person

279 Note 1 to entry: When incorporated into a luminaire, a replaceable LED module can be classified as replaceable,
280 non-user replaceable or non-replaceable depending on the luminaire design.

281 **3.3**

282 **non-user replaceable LED module**

283 LED module designed to be replaced only by the manufacturer, his service agent, or similar
284 qualified person

285 Note 1 to entry: When incorporated into a luminaire a non-user replaceable LED module can become classified as
286 non-replaceable due to the luminaire design.

287 **3.4**

288 **LED light source**

289 electric light source based on LED technology

290 Note 1 to entry: An LED light source can take the form of an LED module or an LED lamp.

291 [SOURCE: IEC 60050-845:2020, 845-27-053]

292 **3.5**

293 **integrated LED module**

294 **LEDi module**

295 LED module, incorporating controlgear and any additional elements necessary for stable
296 operation of the light source, designed for direct connection to the supply voltage

297 [SOURCE: IEC 60050-845:2020, 845-27-059]

298 **3.6**

299 **semi-integrated LED module**

300 **LEDsi module**

301 LED module that carries the control unit of the controlgear, and is operated by the separated
302 power supply of the controlgear

303 Note 1 to entry: The term control unit is specified in IEC 60050-845-28-057.

304 [SOURCE: IEC 60050-845:2020, 845-27-060]

305 **3.7**

306 **non-integrated LED module**

307 **LEDni module**

308 LED module which needs a separate control circuitry or control gear to operate

309 Note 1 to entry: One or more LED packages on a printed circuit board or substrate in a geometric structure are
310 regarded as an LED array. No further components are included like electrical, optical, mechanical, and thermal
311 components.

312 [SOURCE: IEC 60050-845:2020, 845-27-061]

313 **3.8**

314 **rated value**

315 <of light sources > value of a quantity, used for specification purposes, declared by the
316 manufacturer or responsible vendor and established under standard test conditions

317 Note 1 to entry: To express the "rated value" of a particular quantity, the term "value" is replaced by the quantity
318 name; for example, rated power, rated voltage, rated current, and rated temperature.

319 Note 2 to entry: The standard test conditions are given in this document.

320 [SOURCE: IEC 60050-845:2020, 845-27-100 modified – "...the relevant standard" in note to
321 entry 2 replaced by "...this document"]

322 **3.9**

323 **type test**

324 test or series of tests for the purpose of checking compliance of the design of a given product
325 with the requirements of the relevant standard

326 **3.10**

327 **type test sample**

328 sample consisting of one or more similar units being representative of the production and
329 submitted by the manufacturer or responsible vendor for the purpose of the type test

330 **3.11**

331 **t_c -point**

332 designated location of the point where to measure the t_c -temperatures at the surface of the LED
333 module

334 **3.12**

335 **t_c -temperature**

336 temperature at the t_c -point, related to the safety of the LED module

- 337 **3.13**
 338 **maximum operating temperature**
 339 $t_{c \text{ rated}}$
 340 <of an LED module> maximum operating temperature to which the rated safety characteristics
 341 are declared by the manufacturer or responsible vendor
- 342 **3.14**
 343 **thermal power**
 344 P_d
 345 power to be transferred from an LED light source to the luminaire by means of heat conduction
- 346 Note 1 to entry: Thermal power is expressed in Watt (W).
 347 Note 2 to entry: P_d is below the rated power of an LED light source.
 348 Note 3 to entry: For LED light sources which do not require heat conduction to the luminaire, P_d is equal to zero.
- 349 **3.15**
 350 **terminal**
 351 conductive part of an LED module, provided for connecting that LED module to one or more
 352 external conductors
- 353 [SOURCE: IEC 60050-151:2001, 151-12-12, modified – "device, electric circuit or electric
 354 network" has been replaced by "LED module" and the Note has been deleted]
- 355 **3.16**
 356 **mains**
 357 AC or DC power distribution system that supplies operating power to electrical equipment
- 358 Note 1 to entry: Mains include public or private utilities and, unless otherwise specified in this document, equivalent
 359 sources such as motor-driven generators and uninterruptible power supplies.
- 360 **3.17**
 361 **interrupted DC voltage**
 362 voltage changing periodically between a DC level and zero
- 363 Note 1 to entry: In interrupted DC voltage waveforms, the duration of the signal at the DC level can vary within one
 364 period.
- 365 **3.18**
 366 **live part**
 367 conductive part intended to be energized under normal operating conditions, including the
 368 neutral conductor and mid-point conductor, but excluding the PEN conductor, PEM conductor
 369 and PEL conductor
- 370 Note 1 to entry: PEN conductor, PEM conductor and PEL conductor are defined in IEC 60050-195:2021, 195-02-12,
 371 195-02-13 and 195-02-14.
 372 Note 2 to entry: This concept does not necessarily imply a risk of electric shock.
 373 [SOURCE: IEC 60050-195:2021, 195-02-19, modified – Note 1 and Note 2 to entry added]
- 374 **3.19**
 375 **hazardous-live-part**
 376 live part that, under certain conditions, can give a harmful electric shock
- 377 [SOURCE: IEC 60050-195:2021, 195-06-05, modified – Note 1 to entry removed]
- 378 **3.20**
 379 **pulse width modulation control**
 380 **PWM control**
 381 pulse control in which the pulse width or frequency or both are modulated within each
 382 fundamental period to produce a certain output waveform
- 383 [SOURCE: IEC 60050-551:1998, 551-16-30]
- 384 **3.21**
 385 **working voltage**
 386 highest RMS voltage across any insulation at any rated electrical supply conditions, transients
 387 being neglected, under normal and under abnormal conditions