



SLOVENSKI STANDARD
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Informacijska tehnologija - Polaganje kablov - 4. del: Preizkušanje vgrajenih optičnih kablov

Information technology - Cabling installation - Part 4: Testing of installed optical fibre cabling

Informationstechnik - Installation von Kommunikationsverkabelung - Teil 4: Messung von installierter Lichtwellenleiterverkabelung

Technologies de l'information - Installation de câblage - Partie 4: Essais d'une installation de câblage à fibres optiques

Ta slovenski standard je istoveten z: prEN 50174-4:2024

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Information technology - Cabling installation - Part 4: Testing of installed optical fibre cabling

Technologies de l'information - Installation de câblage -
Partie 4: Essais d'une installation de câblage à fibres
optiques

Informationstechnik - Installation von
Kommunikationsverkabelung - Teil 4: Messung von
installierter Lichtwellenleiterverkabelung

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2024-10-18.

It has been drawn up by CLC/TC 215.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).
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Document Preview

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199 **European foreword**

200 This document (prEN 50174-4:2024) has been prepared by Technical Committee CLC/TC 215,
201 “Electrotechnical aspects of telecommunication equipment”. It is based on ISO/IEC 14763-3:2024.

202 This document is currently submitted to the Enquiry.

203 The following dates are proposed:

- latest date by which the existence of this document has to be announced at national level (doa) dor + 6 months
- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) dor + 12 months
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) dor + 36 months (to be confirmed or modified when voting)

204 EN 50174 comprises four parts. All for parts support the specification, implementation, operation and
205 qualification of information technology cabling. There are specific requirements for cabling systems that
206 are in accordance with the design requirements of the EN 50173 series. However, the three parts also
207 apply to cabling systems of any design including those in accordance with standards such as EN 50700.

208 This part, prEN 50174-4, is concerned with the measurement and visual inspection of installed optical
209 fibre cabling.

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prEN 50174-4:2024 (E)210 **Introduction**

211 The importance of services delivered by information technology cabling infrastructure is similar to that
 212 of utilities such as heating, lighting and electricity supplies. As with those utilities, interruptions to service
 213 can have a serious impact. Poor quality of service due to lack of planning, use of inappropriate
 214 components, incorrect installation, poor administration or inadequate support can threaten an
 215 organization's effectiveness.

216 There are four phases in the successful implementation of information technology cabling. These are:

- 217 a) design;
- 218 b) specification – the detailed requirement for the cabling, including the planning of its accommodation
 219 and associated building services addressing specific environments (e.g. electromagnetic) together
 220 with the quality assurance requirements to be applied;
- 221 c) installation – in accordance with the requirements of the specification;
- 222 d) operation – the management of connectivity and the maintenance of transmission performance
 223 during the life of the cabling.

224 This European Standard is in four parts and addresses the specification, installation, operational aspects
 225 and measurement of installed cabling. The EN 50173 series and other application standards cover
 226 design issues.

227 This document details the inspection and test procedures for optical fibre cabling designed in
 228 accordance with premises cabling standards including the EN 50173 series and installed in accordance
 229 with the requirements and recommendations of EN 50174-2 and EN 50174-3. This document has been
 230 prepared in support of EN 50173 series.

231 Users of this document should be familiar with relevant premises cabling standards and the other
 232 documents of the EN 50174 series.

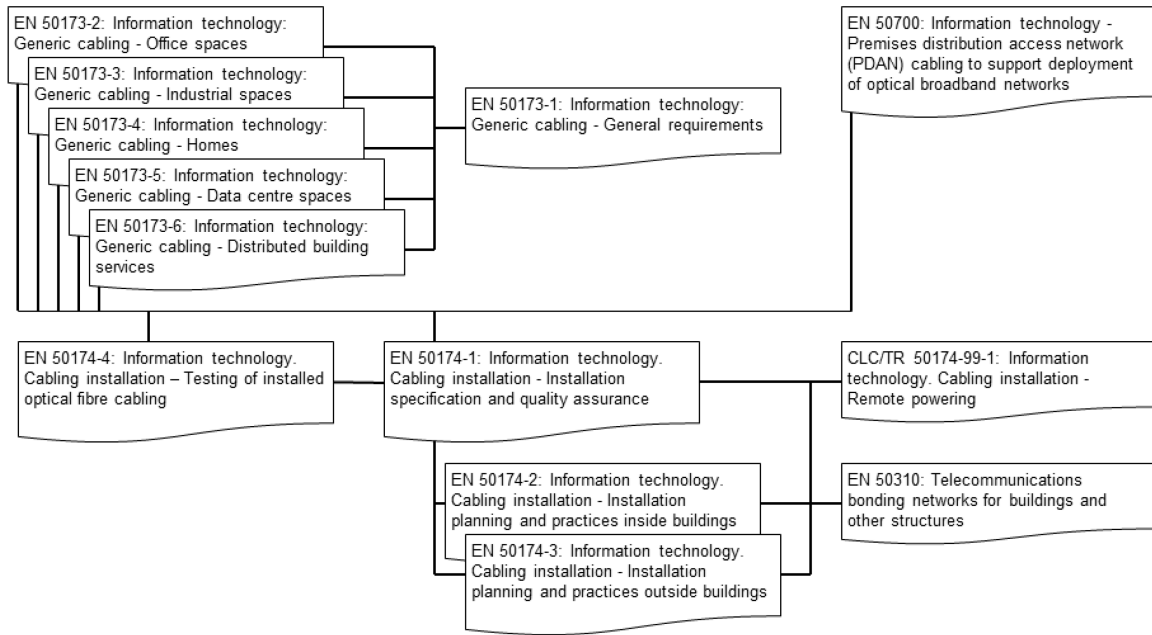
233 EN 50174-1 is used during the specification phase. EN 50174-2 and EN 50174-3 are intended to be
 234 used by the personnel directly involved in the planning aspects (of the specification phase) and
 235 installation phase. EN 50174-2 is applicable inside buildings and EN 50174-3 is applicable outside
 236 buildings.

237 This European Standard is also relevant to:

- 238 • main contractors;
- 239 • designers, suppliers, installers, inspectors (auditors), maintainers and owners of information
 240 technology cabling;
- 241 • end users.

242 Figure 1 and Table 1 show the schematic and contextual relationships between the standards produced
 243 by CLC/TC 215 for information technology cabling, namely:

- 244 1) this and other parts of the EN 50174 series;
- 245 2) generic cabling design (EN 50173 series);
- 246 3) application dependent cabling design (e.g. EN 50700);
- 247 4) bonding requirements (EN 50310).



248

249 **Figure 1 — Schematic relationship between the EN 50174 series and other relevant standards**

250 **Table 1 — Contextual relationship between EN 50174 series and other standards relevant for**
 251 **information technology cabling systems**

Building design phase	Generic cabling design phase	Specification phase	Installation phase	Operation phase
EN 50310	EN 50173-2 EN 50173-3 EN 50173-4 EN 50173-5 EN 50173-6 EN 50173-20 (these ENs reference general requirements of EN 50173-1)	EN 50174-1	EN 50174-2 EN 50174-3 EN 50174-4 EN 50310 EN 50697	EN 50174-1

252 The quality plan for each installation will define the acceptance tests and sampling levels selected for
 253 that installation. Requirements and recommendations for the development of a quality plan are given in
 254 EN 50174-1.

prEN 50174-4:2024 (E)255 **1 Scope**

256 This document specifies systems and methods for the inspection and testing of installed optical fibre
 257 cabling designed in accordance with premises cabling standards including the EN 50173 series. The
 258 test methods refer to existing standards-based procedures where they exist.

259 **2 Normative references**

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

263 EN 50173-1, *Information technology - Generic cabling systems - Part 1: General requirements*

264 EN 50174-1, *Information technology - Cabling installation - Part 1: Installation specification and quality
 265 assurance*

266 EN 60825-2, *Safety of laser products - Part 2: Safety of optical fibre communication systems (OFCS)
 267 (IEC 60825-2)*

268 EN IEC 61280-1-3, *Fibre optic communication subsystem test procedures - Part 1-3: General
 269 communication subsystems - Measurement of central wavelength, spectral width and additional spectral
 270 characteristics (IEC 61280-1-3)*

271 EN IEC 61280-1-4, *Fibre optic communication subsystem test procedures - Part 1-4: General
 272 communication subsystems - Light source encircled flux measurement method (IEC 61280-1-4)*

273 EN IEC 61280-4-1, *Fibre-optic communication subsystem test procedures - Part 4-1: Installed cabling
 274 plant - Multimode attenuation measurement (IEC 61280-4-1)*

275 EN IEC 61280-4-5, *Fibre-optic communication subsystem test procedures - Part 4-5: Installed cabling
 276 plant - Attenuation measurement of MPO terminated fibre optic cabling plant using test equipment with
 277 MPO interfaces (IEC 61280-4-5)*

278 EN IEC 61300-3-35, *Fibre optic interconnecting devices and passive components - Basic test and
 279 measurement procedures - Part 3-35: Examinations and measurements - Visual inspection of fibre optic
 280 connectors and fibre-stub transceivers (IEC 61300-3-35)*

281 EN 61300-3-42, *Fibre optic interconnecting devices and passive components - Basic test and
 282 measurement procedures - Part 3-42: Examinations and measurements - Attenuation of single mode
 283 alignment sleeves and or adaptors with resilient alignment sleeves (IEC 61300-3-42)*

284 EN 61755-2-4, *Fibre optic interconnecting devices and passive components - Connector optical
 285 interfaces - Part 2-4: Connection parameters of non-dispersion shifted single-mode physically contacting
 286 fibres - Non-angled for reference connection applications (IEC 61755-2-4)*

287 EN 61755-2-5, *Fibre optic interconnecting devices and passive components - Connector optical
 288 interfaces - Part 2-5: Connection parameters of non-dispersion shifted single-mode physically contacting
 289 fibres - Angled for reference connection applications (IEC 61755-2-5)*

290 EN 61755-3-1, *Fibre optic connector optical interfaces - Part 3-1: Optical interface, 2,5 mm and 1,25
 291 mm diameter cylindrical full zirconia PC ferrule, single mode fibre (IEC 61755-3-1)*

292 EN 61755-3-2, *Fibre optic connector optical interfaces - Part 3-2: Optical interface, 2,5 mm and 1,25
 293 mm diameter cylindrical full zirconia ferrules for 8 degrees angled-PC single mode fibres (IEC 61755-3-
 294 2)*

295 EN 61755-3-31, *Fibre optic interconnecting devices and passive components - Connector optical*
 296 *interfaces - Part 3-31: Connector parameters of non-dispersion shifted single mode physically contacting*
 297 *fibres - Angled polyphenylene sulphide rectangular ferrules (IEC 61755-3-31)*

298 EN IEC 62614-1, *Fibre optics - Multimode launch conditions - Part 1: Launch condition requirements for*
 299 *measuring multimode attenuation (IEC 62614-1)*

300 IEC 60050-731, *International Electrotechnical Vocabulary (IEV) - Part 731: Optical fibre communication)*

301 IEC TR 61282-14, *Fibre optic communication system design guidelines - Part 14: Determination of the*
 302 *uncertainties of attenuation measurements in fibre plants*

303 IEC PAS 63267-3-31, *Fibre optic interconnecting devices and passive components – Fibre optic*
 304 *connector optical interfaces – Part 3-31: End face geometry – Flat PC PPS rectangular ferrule multimode*
 305 *fibres*

306 **3 Terms, definitions, abbreviated terms and symbols**

307 **3.1 Terms and definitions**

308 For the purposes of this document, the terms and definitions given in EN 50173-1, IEC 60050-731 and
 309 the following apply.

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

- 311 • IEC Electropedia: available at <https://www.electropedia.org/>
- 312 • ISO Online browsing platform: available at <https://www.iso.org/obp>

313 **3.1.1**

314 **adaptor**

315 device that enables interconnection between terminated optical fibre cables

316 **3.1.2**

317 **attenuation**

318 A

319 reduction in optical power induced by transmission through a medium such as optical fibre, given as A
 320 $= -10 \log (P_{\text{out}}/P_{\text{in}})$, where P_{in} and P_{out} are the power, typically measured in mW, into and out of the
 321 cabling

322 Note 1 to entry: The values of A are in decibel (dB).

323 **3.1.3**

324 **attenuation dead zone**

325 <reflective or non-reflective event> region on an OTDR after the event where the displaced trace
 326 deviates from the undisturbed backscatter trace by more than a given vertical distance ΔF

327 Note 1 to entry: ΔF is commonly accepted to be a value of 0,5 dB

328 [SOURCE: EN 61746-1:2011, and EN 61746-2:2011, 3.3, modified – The note has been changed and
 329 Figure 1 has not been included.]

330 **3.1.4**

331 **bi-directional measurement**

332 technique consisting of two measurements of the same optical fibre, made by launching light into
 333 opposite ends of that fibre

prEN 50174-4:2024 (E)334 **3.1.5**335 **cable sheath**

336 covering over the optical fibre or conductor assembly that can include one or more metallic members,
337 strength members or jackets

338 Note 1 to entry: Sometimes simply referred to as “sheath”.

339 **3.1.6**340 **connection**

341 mated device including terminations connecting two cables or cable elements

342 **3.1.7**343 **encircled flux**

344 fraction of cumulative near-field power to the total output power as a function of radial distance from the
345 optical centre of the core

346 **3.1.8**347 **fail result**

348 measured value which fails to meet the specified requirement and where the absolute value of the
349 difference between the measured value and the specified requirement is greater than the stated
350 measurement uncertainty

351 **3.1.9**352 **launch test cord**

353 cable assembly used to connect from a light source to the cabling under test or as part of a test reference
354 measurement

355 **3.1.10**356 **light source and power meter**

357 test system consisting of a light source (LS), power meter (PM) and associated test cords used to
358 measure the attenuation of installed cable plant

359 **3.1.11**360 **marginal result**

361 measured value which differs from the specified requirement by an amount not exceeding the stated
362 measurement uncertainty

363 **3.1.12**364 **multimode fibre**

365 optical fibre along whose core the radiation of two or more bound modes can propagate at the
366 wavelength of interest

367 Note 1 to entry: A typical multimode fibre propagates 100 modes or more.

368 [SOURCE: IEC 60050-731:1991, 731-02-03, modified – The definition has been slightly changed and
369 Note 1 to entry added.]

370 **3.1.13**371 **optical fibre**

372 waveguide shaped as a filament, made of dielectric materials for guiding optical waves

373 [SOURCE: IEC 60050-151:2001/AMD3:2019, 151-12-35]

374 **3.1.14**375 **optical time domain reflectometer**376 **OTDR**

377 test system consisting of an optical time-domain reflectometer and associated test cords used to
378 characterize and measure the attenuation of installed cable plant and specific elements within that cable
379 plan