

საქართველოს სტანდარტი

სსკ: 35.110

ინფორმაციული ტექნოლოგია - კაბელის მონტაჟი - ნაწილი 3: ინსტალაციის
დაგეგმვა და პრაქტიკა შენობის გარეთ

საინფორმაციო ნაწილი. სრული ტექსტის სანახავად შეიძინეთ სტანდარტი.

სსტ ენ 50174-3:2013/2021

საინფორმაციო მონაცემები

1 მიღებულია და დაშვებულია სამოქმედოდ: სსიპ-საქართველოს სტანდარტებისა და მეტროლოგიის ეროვნული სააგენტოს გენერალური დირექტორის 02/09/2021 წლის № 53 განკარგულებით

2 მიღებულია „თავფურცლის“ თარგმნის მეთოდით: სტანდარტიზაციის ევროპული კომიტეტის სტანდარტი ენ 50174-3:2013 „ ინფორმაციული ტექნოლოგია - კაბელის მონტაჟი - ნაწილი 3: ინსტალაციის დაგეგმვა და პრაქტიკა შენობის გარეთ”

3 პირველად

4 რეგისტრირებულია: სსიპ-საქართველოს სტანდარტებისა და მეტროლოგიის ეროვნული სააგენტოს რეესტრში: 02/09/2021 წლის №268-1.3-021098

წინამდებარე სტანდარტის ნებისმიერი ფორმით გავრცელება სააგენტოს ნებართვის გარეშე აკრძალულია

საინფორმაციო ნაწილი. სრული ტექსტის სანახავად შეიძინეთ სტანდარტი.

English version

**Information technology -
Cabling installation -
Part 3: Installation planning and practices outside buildings**

Technologies de l'information -
Installation de câblage -
Partie 3: Planification et pratiques
d'installation à l'extérieur des bâtiments

Informationstechnik -
Installation von
Kommunikationsverkabelung -
Teil 3: Installationsplanung und
Installationspraktiken im Freien

This European Standard was approved by CENELEC on 2013-09-02. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

Contents	Page
Foreword	5
Introduction	6
1 Scope and conformance	9
1.1 Scope	9
1.2 Conformance.....	10
2 Normative references	10
3 Terms, definitions and abbreviations	13
3.1 Terms and definitions	13
3.2 Abbreviations	15
4 Requirements for planning installations of information technology cabling	15
4.1 Safety	15
4.2 Documentation.....	17
4.3 Pathways	17
4.4 Pathway systems.....	28
4.5 Pathway systems other than for core and access networks	32
4.6 Closures	36
4.7 Cabling.....	37
4.8 Spaces and structures	39
4.9 Spaces and structures other than for core and access networks	42
4.10 Administration	46
5 Requirements for the installation of information technology cabling	46
5.1 Safety	46
5.2 Documentation.....	48
5.3 Installation practices	48
5.4 Labelling	63
5.5 Testing	63
5.6 Contractual acceptance	63
5.7 Operation.....	63
6 Segregation	63
6.1 General.....	63
6.2 Segregation of underground information technology cabling	64
6.3 Segregation of aerial information technology cabling	67
6.4 Segregation with respect to specific sources of EMI	71
7 Additional installation practices for specific sites and services	73
7.1 Hospitals.....	73
7.2 Airports	73
7.3 Nuclear areas	73
7.4 Chemical manufacturing areas	74
7.5 Railways (overground and underground).....	74
Annex A (informative) EMC and protection	77
A.1 Coupling mechanisms and countermeasures.....	77
A.2 The EMC concept.....	81
A.3 Filtering and electrical isolation components and surge protective devices	82
Annex B (informative) Earth potential rise (EPR)	88
B.1 General.....	88
B.2 Limit of the hot zone.....	88
Annex C (informative) Application of responsibilities	90
Annex D (informative) A-deviations	93
Bibliography	96

Figures

Figure 1 — Schematic relationship between EN 50174 series and other relevant standards.....7

Figure 2 — Examples of areas covered by this document.....10

Figure 3 — Example of cabling installations outside buildings18

Figure 4 — Cable arrangement in a metallic section31

Figure 5 — Example of wind vibration damper35

Figure 6 — Example of an underground conduit entrance for information technology cables into a building.....43

Figure 7 — Example of the use of a galvanic isolation device44

Figure 8 —Continuity of metallic cable management systems52

Figure 9 — Interruption of metallic cable management systems at fire barriers.....52

Figure 10 — Example showing the protection of underground information technology cables when located next to power supply cables65

Figure 11 — Separation of adjacent infrastructures.....68

Figure 12 — Separation distances on supporting structures.....70

Figure 13 — Separation distance on supporting structures with lighting devices70

Figure 14 — Clearance between information technology cabling and standard gauge railways.....74

Figure 15 — Clearances providing protection to information technology cabling against falling contact wires.....76

Figure A.1 — Screened cables reduce capacitive coupling.....78

Figure A.2 — Electrical field to cable, capacitive coupling example79

Figure A.3 — Magnetic field to loop, inductive coupling example79

Figure A.4 — Magnetic field80

Figure A.5 — Earthing arrangement.....81

Figure A.6 — Earthing and bonding of filters.....83

Figure A.7 — Mounting of filters84

Figure A.8 — Installation of power filter.....84

Figure A.9 — Installation guidelines for transformers86

Figure A.10 — Installation guidelines for optocouplers.....86

Figure A.11 — Short connections of surge protective devices87

Figure B.1 — Definition of hot zone.....88

Tables

Table 1 — Contextual relationship between EN 50174 series and other standards relevant for information technology cabling systems8

Table 2 — Design and planning of underground pathways.....19

Table 3 — Requirements and recommendation for pathway depths below finished surface.....20

Table 4 — Design and planning of dedicated aerial pathways.....23

Table 5 — Minimum installed clearances above ground for aerial cables25

Table 6 — Stacking height for typical distances L30

Table 7 — Family and detailed specifications for outdoor optical fibre cables.....38

Table 8 — Minimum distance between information technology cables and earthed electrodes of power systems in rural and urban environments66

Table 9 — Minimum distance between information technology cables and earthed electrodes of power systems in accordance with ITU-T K.8.....66

Table 10 — Minimum clearances and protective measures at crossings between information technology cables and various underground services.....67

Table 11 — Minimum clearances between aerial information technology and overhead power supply cabling68

Table 12 — Example of limit distances72

Table A.1 — EMC checklist.....82

Table B.1 — Minimum distance (HV installations less than 25 kV)89

Table B.2 — Minimum distance (HV installations exceeding 25 kV).....89

Table C.1 — Responsibilities template.....91

Table C.2 — Example of completed responsibilities92

Foreword

This document (EN 50174-3:2013) has been prepared by CLC/TC 215 "Electrotechnical aspects of telecommunication equipment".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2014-09-02
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2016-09-02

This document supersedes EN 50174-3:2003.

EN 50174 comprises three parts:

- EN 50174-1, *Information technology — Cabling installation — Part 1: Installation specification and quality assurance*;
- EN 50174-2, *Information technology — Cabling installation — Part 2: Installation planning and practices inside buildings*;
- EN 50174-3, *Information technology — Cabling installation — Part 3: Installation planning and practices outside buildings* (the present document).

All three parts support the specification, implementation and operation of information technology cabling. There are specific requirements for cabling systems that are in accordance with the design requirements of EN 50173 series. However, the three parts also apply to cabling systems of any design including those in accordance with standards such as EN 50098-1 or EN 50098-2.

This part, EN 50174-3, is concerned with the planning and installation of information technology cabling using metallic cabling and optical fibre cabling outside buildings; it is not confined to the border of a particular premises and includes wide area information technology cabling of any kind. It provides guidance as to the responsibilities of those involved and is intended to be referenced in relevant contracts.

EN 50174-3:2003 (the 1st edition) has been completely revised in the light of the technical evolution and the feedback received from the users of the 1st edition. Major changes include:

- a) restructuring of the contents to align with the structure of EN 50174-1:2009 and EN 50174-2:2009 (including their associated amendments); in particular, the pertinent requirements and recommendations have been clearly distinguished and are presented in separate subclauses;
- b) where appropriate, text has been aligned with that of EN 50174-1 and EN 50174-2;
- c) requirements and recommendations for wide area information technology cabling have been elaborated in greater detail;
- d) a new Annex A on EMC and protection (the existing Annex A is renumbered as Annex B) and a new Annex C on the application of responsibilities have been added.

Introduction

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

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

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

This European Standard is in three parts and addresses the specification, installation and operational aspects. EN 50173 series and other application standards cover design issues.

EN 50174-1 is used during the specification phase. It addresses the:

- installation specification, quality assurance documentation and procedures;
- documentation and administration;
- operation and maintenance.

This part, EN 50174-3, and EN 50174-2 are intended to be used by the personnel directly involved in the planning aspects (of the specification phase) and installation phase. EN 50174-2 is applicable inside buildings and EN 50174-3 is applicable outside buildings.

This European Standard is applicable to all types of information technology cabling outside buildings, including generic cabling systems designed in accordance with EN 50173 series. The requirements and recommendations of this European Standard may be applied to cabling that is defined as part of the building.

The planning of the pathway systems, spaces and structures within the core and access network cabling as described in Figure 2 that are owned by access providers is excluded except for requirements and recommendations that provide basic safety, function and environmental objectives for mechanical, ingress and climatic characteristics (i.e. excluding pathway dimensions, distribution of spaces and similar constraints based on specific transmission methods).

This European Standard is also relevant to:

- architects, building designers and builders;
- main contractors;
- designers, suppliers, installers, inspectors (auditors), maintainers and owners of information technology cabling;
- public network providers and local service providers;
- end users.

This part, EN 50174-3, contains requirements and recommendations relating to the installation planning and practices by defining:

- i) planning strategy (road map) and guidance depending on the application, electromagnetic environment, building infrastructure and facilities, etc.;
- ii) planning and installation requirements for metallic and optical fibre information technology cabling depending on the application, electromagnetic environment, building infrastructure and facilities, etc.;
- iii) the practices and procedures to be adopted to ensure that the cabling is installed in accordance with the specification.

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

- 1) this part and other parts of EN 50174 series;
- 2) generic cabling design (EN 50173 series);
- 3) application dependent cabling design (e.g. EN 50098 series);
- 4) testing of installed cabling (EN 50346);
- 5) equipotential bonding requirements (EN 50310).

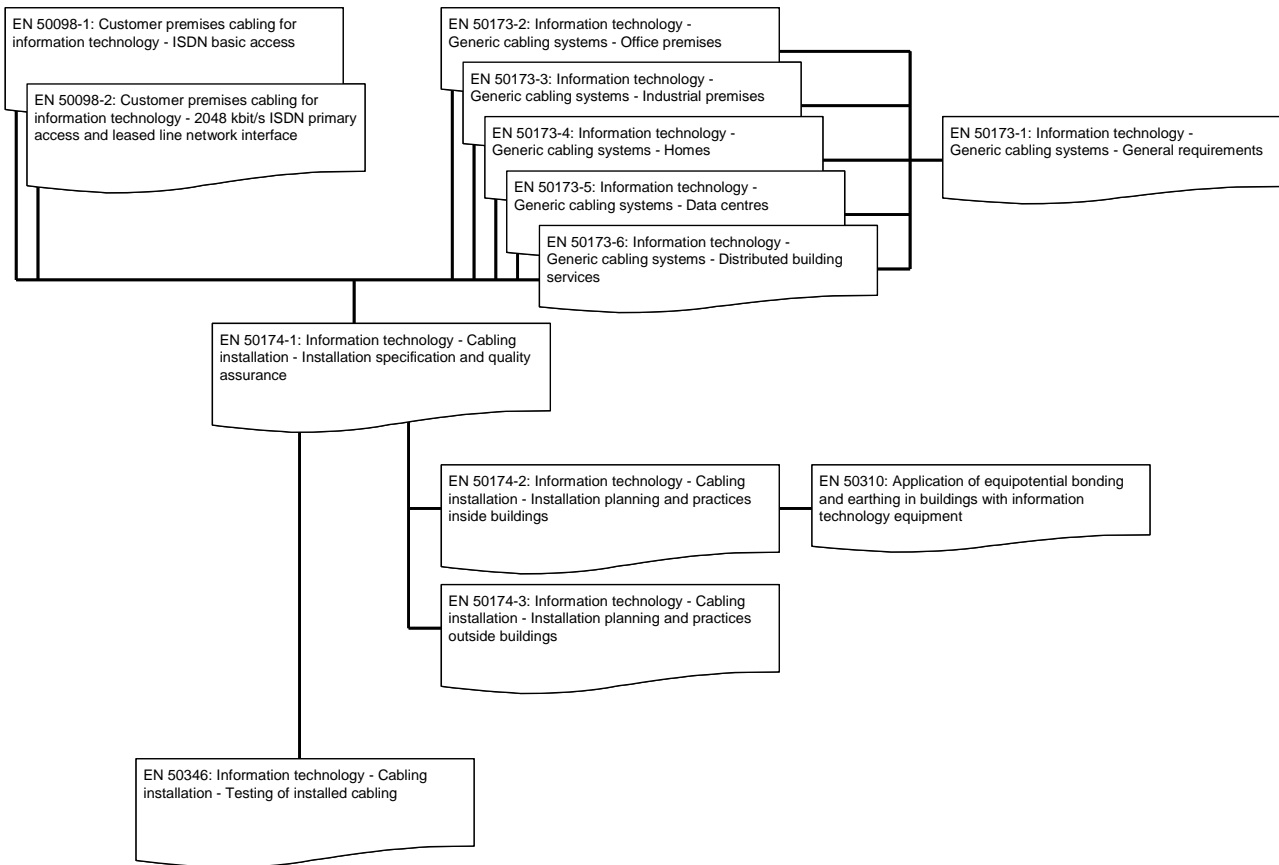


Figure 1 — Schematic relationship between EN 50174 series and other relevant standards

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

Building design phase	Generic cabling design phase	Specification phase	Installation phase	Operation phase
<p>EN 50310</p> <p>6. Earthing networks</p>	<p>EN 50173 series except EN 50173-4</p> <p>4: Structure</p> <p>5: Channel performance</p> <p>7: Cable requirements</p> <p>8: Connecting hardware requirements</p> <p>9: Requirements for cords and jumpers</p> <p>A: Link performance limits</p> <p>and</p> <p>EN 50173-4</p> <p>4 and 5: Structure</p> <p>6: Channel performance</p> <p>8: Cable requirements</p> <p>9: Connecting hardware requirements</p> <p>10: Requirements for cords and jumpers</p> <p>A: Link performance limits</p>	<p>EN 50174-1</p> <p>4: Requirements for specifying installations of information technology cabling</p> <p>5: Requirements for installers of information technology cabling</p>	<p>EN 50174-2</p> <p>5: Requirements for the installation of information technology cabling</p> <p>6: Segregation of metallic information technology cabling and power supply cabling</p> <p>and</p> <p>EN 50174-3</p> <p>and</p> <p>(for equipotential bonding)</p> <p>EN 50310</p> <p>and</p> <p>EN 50346</p> <p>4: General requirements</p> <p>5: Test parameters for balanced cabling</p> <p>6: Test parameters for optical fibre cabling</p>	<p>EN 50174-1</p> <p>4: Requirements for specifying installations of information technology cabling</p>
		<p>Planning phase</p>		
		<p>EN 50174-2</p> <p>4: Requirements for planning installations of information technology cabling</p> <p>6: Segregation of metallic information technology cabling and power supply cabling</p> <p>7: Electricity distribution systems and lightning protection</p> <p>and</p> <p>EN 50174-3</p> <p>and</p> <p>(for equipotential bonding)</p> <p>EN 50310</p>		

საინფორმაციო ნაწილი. სრული ტექსტის სახანავედ შეიძინეთ სტანდარტი.