



# SLOVENSKI STANDARD

## SIST EN 50174-2:2009

01-oktober-2009

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SIST EN 50174-2:2001

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Information technology - Cabling installation -- Part 2: Installation planning and practices inside buildings

Information technology - Cabling installation -- Part 2: Installation planning and practices inside buildings

Informationstechnik - Installation von Kommunikationsverkabelung -- Teil 2: Installationsplanung und Installationspraktiken in Gebäuden

Technologies de l'information - Installation de câblage -- Partie 2: Planification et pratiques d'installation à l'intérieur des bâtiments

Ta slovenski standard je istoveten z: EN 50174-2:2009

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### ICS:

33.040.50	Vodi, zveze in tokokrogi	Lines, connections and circuits
35.110	Omreževanje	Networking

SIST EN 50174-2:2009 en,de

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 50174-2**

May 2009

ICS 35.110; 91.140.50

Supersedes EN 50174-2:2000

English version

**Information technology -  
Cabling installation -  
Part 2: Installation planning and practices inside buildings**

Technologies de l'information -  
Installation de câblages -  
Partie 2: Planification et pratiques  
d'installation à l'intérieur des bâtiments

Informationstechnik -  
Installation  
von Kommunikationsverkabelung -  
Teil 2: Installationsplanung  
und Installationspraktiken in Gebäuden

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This European Standard was approved by CENELEC on 2009-05-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

**CENELEC**

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

**Central Secretariat: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 215, Electrotechnical aspects of telecommunication equipment.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50174-2 on 2009-05-01.

This European Standard supersedes EN 50174-2:2000.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2010-05-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2012-05-01

EN 50174 comprises three parts. 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 the 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 50174-2, is concerned with the planning and installation of information technology cabling using metallic cabling and optical fibre cabling inside buildings. It provides guidance as to the responsibilities of those involved and is intended to be referenced in relevant contracts.

Additional clauses containing normative requirements for specific types of premises will be added as amendments, or as revisions, to this standard. At the time of publication of this European Standard, the following clauses are planned:

- homes;
- data centres;
- operator buildings.

It does not cover those aspects of installation associated with the transmission of signals in free space between transmitters, receivers or their associated antenna systems (e.g. wireless, radio, microwave or satellite).

This document contains two informative annexes:

- Annex A, providing information on EMC and protection;
  - Annex B, containing a minimum set of responsibilities applicable to installers and enabling national-specific amendment to define other responsibilities.
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## 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. The 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 50174-2, and EN 50174-3 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 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.

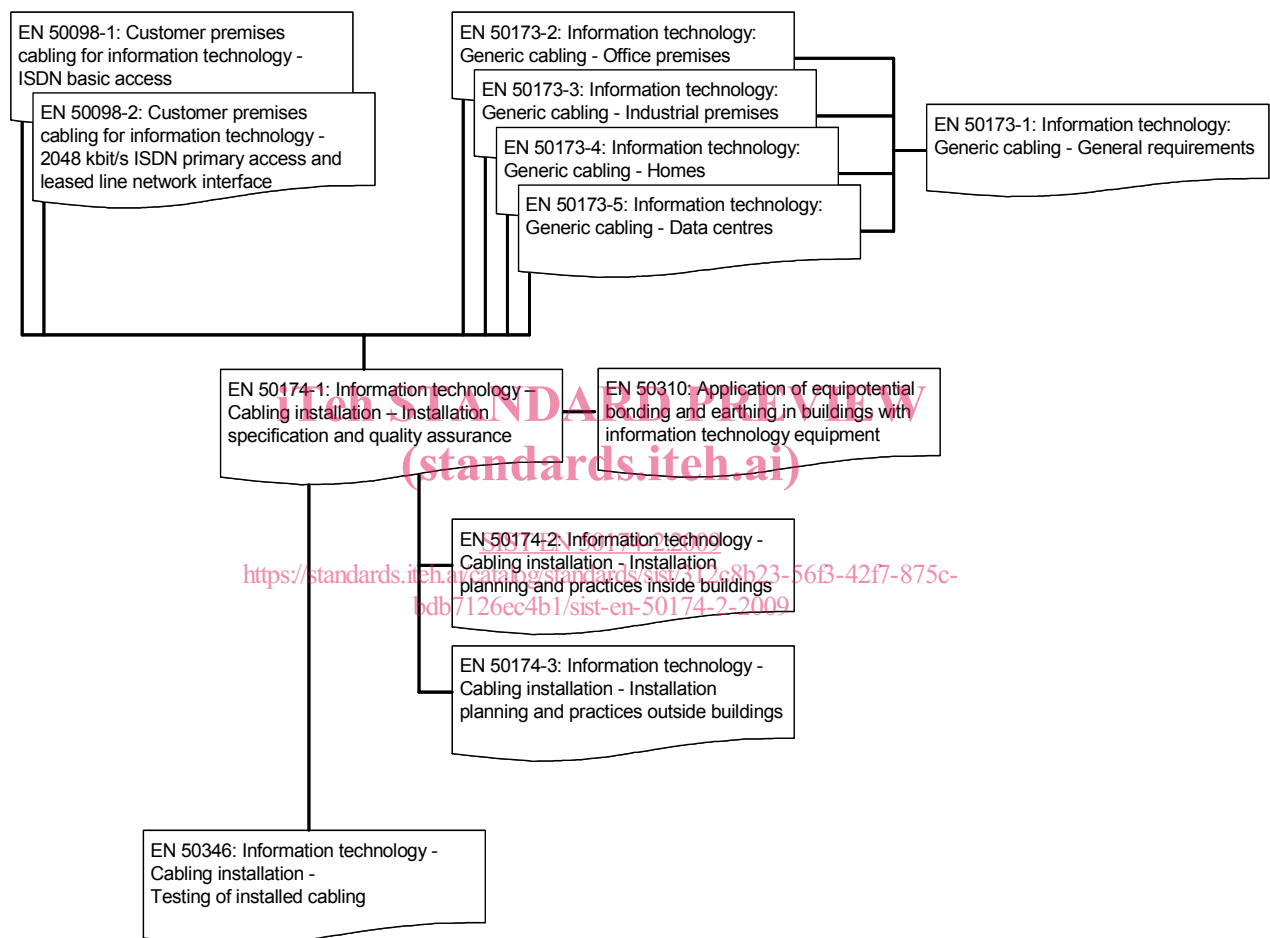
This part, EN 50174-2, contains requirements and recommendations relating to the installation planning and practices by defining:

- 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 and other parts of the 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 the 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><b>EN 50310</b></p> <p>5.2: Common bonding network (CBN) within a building</p> <p>6.3: AC distribution system and bonding of the protective conductor (TN-S)</p>	<p><b>EN 50173 series except EN 50173-4</b></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><b>and</b></p> <p><b>EN 50173-4</b></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><b>EN 50174-1</b></p> <p>4: Requirements for specifying installations of information technology cabling</p> <p>5: Requirements for installers of information technology cabling</p>		<p><b>EN 50174-1</b></p> <p>4: Requirements for specifying installations of information technology cabling</p>
		<p><b>Planning phase</b></p> <p><b>EN 50174-2</b></p> <p>4: Requirements for planning installations of information technology cabling</p> <p>6: Segregation of metallic information technology cabling and mains power cabling</p> <p>7: Electricity distribution systems and lightning protection</p> <p><b>and</b></p> <p><b>EN 50174-3</b></p> <p><b>and</b></p> <p><b>(for equipotential bonding)</b></p> <p><b>EN 50310</b></p> <p>5.2: Common bonding network (CBN) within a building</p> <p>6.3: AC distribution system and bonding of the protective conductor (TN-S)</p>		

## 1 Scope and conformance

### 1.1 Scope

This European Standard specifies requirements for the following aspects of information technology cabling:

- a) planning;
- b) installation practice.

This European Standard is applicable to all types of information technology cabling inside buildings (and may be applied to cabling that is defined as part of the building) including generic cabling systems designed in accordance with the EN 50173 series. The requirements of Clauses 4, 5 and 6 of this standard are premises-independent unless amended by the requirements of premises-specific clauses.

This European Standard:

- 1) details the considerations for satisfactory installation and operation of information technology cabling;
- 2) excludes specific requirements applicable to other cabling systems (e.g. mains power cabling); however, it takes account of the effects other cabling systems may have on the installation of information technology cabling (and vice versa) and gives general advice;
- 3) excludes those aspects of installation associated with the transmission of signals in free space between transmitters, receivers or their associated antenna systems (e.g. wireless, radio, microwave or satellite).

This European Standard is intended for application within commercial and residential premises.

This standard is applicable to certain hazardous environments but does not exclude additional requirements which are applicable in particular circumstances, defined by e.g. electricity supply and electrified railways.

[SIST EN 50174-2:2009](https://standards.iteh.ai/catalog/standards/sist/312c8b23-56B-42f7-875c-bdb7126cc4b1/sist-en-50174-2-2009)

### 1.2 Conformance

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For a cabling installation to conform to this European Standard:

- a) the planning of the installation shall meet the requirements of Clause 4;
- b) the installation practices shall meet the requirements of Clause 5;
- c) the additional requirements of the applicable premises-specific clause shall be met;
- d) the equipotential bonding system within the premises shall be in accordance with EN 50310;
- e) where a lightning protection system is required, it shall conform to the "integrated lightning protection system" according to EN 62305-4;
- f) other lightning protection systems, including the "isolated lightning protection system" according to EN 62305-3 are allowed provided that specific restrictions are applied both to the implementation of the information technology cabling and the requirements of EN 50310 as agreed between the planners of the lightning protection system and the information technology cabling;
- g) local regulations, including safety, shall be met.

The responsibilities for specific elements of conformance may be made by national-specific amendment of Annex B.

## 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.

CLC/TR 50450:2006, *Resistibility requirements for equipment having (a) telecommunication port(s)*

EN 50085-1, *Cable trunking systems and cable ducting systems for electrical installations – Part 1: General requirements*

EN 50085-2 (series), *Cable trunking systems and cable ducting systems for electrical installations*

EN 50173-1:2007, *Information technology – Generic cabling systems – Part 1: General requirements*

EN 50173-2, *Information technology – Generic cabling systems – Part 2: Office premises*

EN 50173-3:2007, *Information technology – Generic cabling systems – Part 3: Industrial premises*

EN 50173-4, *Information technology – Generic cabling systems – Part 4: Homes*

EN 50173-5, *Information technology – Generic cabling systems – Part 5: Data centres*

EN 50174-1:2009, *Information technology – Cabling installation – Part 1: Installation specification and quality assurance*

EN 50174-3, *Information technology – Cabling installation – Part 3: Installation planning and practices outside buildings*

EN 50288 series, *Multi-element metallic cables used in analogue and digital communication and control*

EN 50310, *Application of equipotential bonding and earthing in buildings with information technology equipment*

EN 50346, *Information technology – Cabling installation – Testing of installed cabling*

EN 60079-0, *Electrical apparatus for explosive gas atmospheres – Part 0: General requirements* (IEC 60079-0:2004, mod.)

EN 60079-14, *Explosive atmospheres – Part 14: Electrical installations design, selection and erection* (IEC 60079-14)

EN 60079-17, *Explosive atmospheres -- Part 17: Electrical installations inspection and maintenance* (IEC 60079-17)

EN 60332-1-2, *Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame* (IEC 60332-1-2)

EN 60529, *Degrees of protection provided by enclosures (IP code)* (IEC 60529)

EN 60825 (series), *Safety of laser products* (IEC 60825 series)

EN 60950 (series), *Information technology equipment – Safety* (IEC 60950 series, mod.)

EN 61000-6-1, *Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments* (IEC 61000-6-1)

EN 61000-6-2, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments* (IEC 61000-6-2)

EN 61000-6-3, *Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments* (IEC 61000-6-3)

- EN 61000-6-4, *Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments* (IEC 61000-6-4)
- EN 61241-14, *Electrical apparatus for use in the presence of combustible dust – Part 14: Selection and installation* (IEC 61241-14)
- EN 61386-1, *Conduit systems for cable management – Part 1: General requirements* (IEC 61386-1)
- EN 61386-2X (series), *Conduit systems for cable management – Part 2X: Particular requirements* (IEC 61386-2X series)
- EN 61534 (series), *Powertrack systems* (IEC 61534 series)
- EN 61537, *Cable management – Cable tray systems and cable ladder systems* (IEC 61537)
- EN 61558-1, *Safety of power transformers, power supplies, reactors and similar products – Part 1: General requirements and tests* (IEC 61558-1)
- EN 61643 (series), *Low voltage surge protective devices* (IEC 61643 series, mod.)
- EN 61784-1, *Industrial communication networks – Profiles – Part 1: Fieldbus profiles* (IEC 61784-1)
- EN 61784-2, *Industrial communication networks – Profiles – Part 2: Additional fieldbus profiles for realtime networks based on ISO/IEC 8802-3* (IEC 61784-2)
- EN 61784-3, *Industrial communication networks – Profiles – Part 3: Functional safety fieldbuses – General rules and profile definitions* (IEC 61784-3)
- EN 61784-3-1, *Industrial communication networks – Profiles – Part 3-1: Functional safety fieldbuses – Additional specifications for CPF 1* (IEC 61784-3-1)
- EN 61784-5-2, *Industrial communication networks – Profiles – Part 5-2: Installation of fieldbuses – Installation profiles for CPF 2* (IEC 61784-5-2)
- EN 61784-5-3, *Industrial communication networks – Profiles – Part 5-3: Installation of fieldbuses – Installation profiles for CPF 3* (IEC 61784-5-3)
- EN 61918, *Industrial communication networks – Installation of communication networks in industrial premises* (IEC 61918:2007, mod.)
- EN 62305-2, *Protection against lightning – Part 2: Risk management* (IEC 62305-2)
- EN 62305-4, *Protection against lightning – Part 4: Electrical and electronic systems within structures* (IEC 62305-4)
- HD 384/HD 60364 (series), *Low-voltage electrical installations* (IEC 60364 series, mod.)
- HD 60364-1:2008, *Low-voltage electrical installations – Part 1: Fundamental principles, assessment of general characteristics, definitions* (IEC 60364-1:2005, mod.)
- HD 60364-4-41:2007, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock* (IEC 60364-4-41:2005, mod.)
- HD 384.4.442 S1:1997, *Electrical installations of buildings – Part 4: Protection for safety – Chapter 44: Protection against overvoltages – Section 442: Protection of low-voltage installations against faults between high-voltage systems and earth*
- HD 60364-4-443, *Electrical installations of buildings – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances – Clause 443: Protection against overvoltages of atmospheric origin or due to switching* (IEC 60364-4-44:2001/A1:2003, mod.)

HD 384.5/HD 60364-5 (series), *Electrical installation of buildings – Part 5: Selection and erection of electrical equipment* (IEC 60364-5 series, mod.)

HD 384.5.52 S1:1995, *Electrical installations of buildings – Part 5: Selection and erection of electrical equipment – Chapter 52: Wiring systems* (IEC 60364-5-52:1993, mod.)

HD 60364-5-534, *Low-voltage electrical installations – Part 5-53: Selection and erection of electrical equipment – Isolation, switching and control – Clause 534: Devices for protection against overvoltages* (IEC 60364-5-53:2001/A1:2002 (Clause 534), mod.)

HD 60364-5-54, *Low-voltage electrical installations – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements, protective conductors and protective bonding conductors* (IEC 60364-5-54:2002, mod.)

EN 300 253:2002, *Equipment Engineering (EE) – Earthing and bonding of telecommunication equipment in telecommunication centres*

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

IEC 60050-826:2004, *International Electrotechnical Vocabulary (IEV) – Part 826: Electrical installations*

IEC/TR 61000-5 (series), *Electromagnetic compatibility (EMC) – Part 5: Installation and mitigation guidelines*

IEC/TR 61000-5-2, *Electromagnetic compatibility (EMC) – Part 5: Installation and mitigation guidelines – Section 2: Earthing and cabling*

IEC/TR 61000-5-3, *Electromagnetic compatibility (EMC) – Part 5-3: Installation and mitigation guidelines – HEMP protection concepts*

IEC 61784-4 <sup>1)</sup>, *Industrial Communications – Fieldbus Profile – Part 4: Profiles for secure communications in industrial networks*

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### 3 Terms, definitions and abbreviations

#### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50174-1 and the following apply.

Where the cabling is designed in accordance with standards in the EN 50173 series, the additional definitions of those standards are applicable.

NOTE The definitions with respect to earthing and bonding are taken from series IEC 60050 and EN 300 253:2002; reference to these standards is indicated in square brackets.

##### 3.1.1

##### **bonding network**

set of interconnected conductive structures that provides an „electromagnetic shield“ for electronic systems and personnel at frequencies from direct current (DC) to low radio frequency (RF)

NOTE The term „electromagnetic shield“ denotes any structure used to divert, block or impede the passage of electromagnetic energy. In general, a bonding network need not be connected to earth but all bonding networks (BNs) considered in the present document will have an earth connection.

[EN 300 253:2002, 3.1.2]

##### 3.1.2

##### **common bonding network**

principal means for effective bonding and earthing inside a building with information technology equipment

<sup>1)</sup> In preparation.

NOTE It is the set of metallic components that are intentionally or incidentally interconnected to form the principal BN in a building. These components include: structural steel or reinforcing rods, metallic plumbing, alternating current (AC) power conduit, protective conductors (PE), cable racks and bonding conductors. The CBN is connected to the earthing network.

[EN 300 253:2002, 3.1.2, modified]

### 3.1.3

#### **earth electrode**

conductive part, which may be embedded in the soil or in a specific conductive medium, e.g. concrete or coke, in electric contact with earth

[IEC 60050-826:2004, 826-13-05; IEC 60050-195:1998, 195-02-01, modified]

### 3.1.4

#### **earthing conductor**

conductor which provides a conductive path, or part of the conductive path, between a given point in a system or in an installation or in equipment and an earth electrode or an earth-electrode network

[IEC 60050-826:2004, 826-13-12; IEC 60050-195:1998, 195-02-03, modified]

### 3.1.5

#### **equipotential bonding**

provisions of electric connections between conductive parts, intended to achieve equipotentiality

[IEC 60050-826:2004, 826-13-19; IEC 60050-195:1998, 195-01-10]

### 3.1.6

#### **functional earthing conductor**

conductors that are only used for functional earthing (not protection)

### 3.1.7

#### **high-voltage**

voltage over AC 1 000 V r.m.s. or DC 1 500 V

### 3.1.8

#### **isolated bonding network**

bonding network that has a single point of connection to either the common bonding network or another isolated bonding network

NOTE All isolated bonding networks considered here will have a connection to earth through the single point of connection.

### 3.1.9

#### **meshed bonding network**

bonding network in which all associated equipment frames, racks and cabinets and usually the DC power return conductors are bonded together as well as at multiple points to the common bonding network (CBN)

NOTE Consequently, the meshed BN augments the CBN.

### 3.1.10

#### **metallic information technology cable/cabling**

cables (cabling) utilising metallic conductors for signal transmission

### 3.1.11

#### **parallel earthing conductor**

earthing conductor that is parallel to the mains power cable or information technology cable

### 3.1.12

#### **PEN conductor**

conductor combining the functions of both a protective earthing conductor and a neutral conductor

[IEC 60050-826:2004, 826-13-25; IEC 60050-195:1998, 195-02-12]