
Izenačitev potencialov in ozemljevanje v stavbah z opremo informacijske tehnologije - Dopolnilo A2

Telecommunications bonding networks for buildings and other structures

Anwendung von Maßnahmen für Erdung und Potentialausgleich in Gebäuden mit Einrichtungen der Informationstechnik

Application de liaison équipotentielle et de la mise à la terre dans les locaux avec équipement de technologie de l'information

Ta slovenski standard je istoveten z: EN 50310:2016/A2:2026

ICS:

35.020	Informacijska tehnika in tehnologija na splošno	Information technology (IT) in general
91.140.50	Sistemi za oskrbo z elektriko	Electricity supply systems

SIST EN 50310:2016/A2:2026**en**

Sample Document

get full document from standards.iteh.ai

EUROPEAN STANDARD

EN 50310

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2016

ICS 29.120.50; 91.140.50

Supersedes EN 50310:2010

In accordance with CENELEC/BT Decision D144/010, this consolidated version is purely informal and is intended to be used by the CENELEC National Committees only.

This document includes Amendment 1, approved by CENELEC on 2019-12-13, and Amendment 2, approved by CENELEC on 2026-06-13

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1** and **A2** **A2**.

English Version

Telecommunications bonding networks for buildings and other structures

Application de liaison équipotentielle et de la mise à la terre
dans les locaux avec équipement de technologie de
l'information

Anwendung von Maßnahmen für Erdung und
Potentialausgleich in Gebäuden mit Einrichtungen der
Informationstechnik

get full document from standards.iteh.ai



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

European foreword	4
Introduction	6
1 Scope	8
2 Normative references	8
3 Terms, definitions and abbreviations	9
3.1 Terms and definitions	9
3.2 Abbreviations	12
4 Conformance	12
5 Overview of bonding networks	13
6 Selection of the telecommunications bonding network approach	15
6.1 Assessment of the impact of the telecommunications bonding network on the interconnection of telecommunications equipment	15
6.2 Telecommunications bonding networks	17
6.3 Telecommunications bonding network performance	18
6.3.1 General	18
6.3.2 Requirements	18
6.3.3 DC resistance measurements	19
7 Common features	20
7.1 General	20
7.2 Protective bonding networks	20
7.2.1 Protective bonding network conductors (PBNCs)	20
7.2.2 Main earthing terminal (MET)	20
7.3 Telecommunications entrance facility (TEF)	20
7.4 Telecommunications bonding network components	21
7.4.1 Telecommunications bonding network conductors	21
7.4.2 Telecommunications bonding network connections	21
7.5 Cabinets, frames and racks	22
7.5.1 External connections to a bonding network	22
7.5.2 Rack bonding conductors	23
7.5.3 Internal connections	24
7.6 Miscellaneous bonding connections	25
7.6.1 General	25
7.6.2 Bonding conductors for d.c. resistance control	25
7.6.3 Bonding conductors for impedance control	25
7.7 Documentation	26
8 Dedicated telecommunications bonding network	26
8.1 General	26
8.2 Components	27
8.2.1 Primary bonding busbar (PBB)	27
8.2.2 Secondary bonding busbar (SBB)	28
8.2.3 Bonding conductors for d.c. resistance control	28
8.2.4 Bonding conductors for impedance control	30
8.3 Implementation	31
8.3.1 Primary bonding busbar (PBB)	31
8.3.2 Secondary bonding busbar (SBB)	32
8.3.3 Telecommunications bonding conductor (TBC)	33
8.3.4 Telecommunications bonding backbone (TBB)	33
8.3.5 Backbone bonding conductor (BBC)	33
8.3.6 Bonds to continuous conductive pathway systems	33
8.3.7 Bonds to structural metal	33

9	Local telecommunications bonding networks in conjunction with protective bonding networks	34
9.1	Bonding for local distribution	34
9.1.1	Star protective bonding networks	34
9.1.2	Ring protective bonding networks	35
9.2	Telecommunications bonding conductors	36
9.2.1	Bonding conductors for d.c. resistance control.....	36
9.2.2	Bonding conductors for impedance control	37
9.3	Bonding for areas of telecommunications equipment concentration	37
10	Local telecommunications bonding networks in conjunction with dedicated telecommunications bonding networks	38
10.1	Bonding for areas of telecommunications equipment concentration	38
10.1.1	Requirements	38
10.1.2	Recommendations	38
10.1.3	Cabinets, frames and racks	38
10.2	Telecommunications equipment bonding conductors (TEBC)	38
10.2.1	TEBC for d.c. resistance control	38
10.2.2	TEBC for impedance control	38
10.2.3	Implementation	38
11	Mesh bonded networks	39
11.1	General	39
11.2	Mesh bonding alternatives	40
11.2.1	Local mesh bonding (MESH-IBN) networks	40
11.2.2	MESH-BN	42
11.3	Bonding conductors of a mesh bonding network	42
11.3.1	Requirements	42
11.3.2	Recommendations	43
11.4	Bonding conductors to the mesh bonding network	43
11.5	Supplementary bonding grid (SBG)	44
11.6	System reference potential plane (SRPP)	44
11.6.1	General	44
11.6.2	Access floors	44
11.6.3	Transient suppression plate (TSP)	45
Annex A (normative)	Maintenance of telecommunications bonding network performance	47
A.1	General	47
A.2	Periodic activity	47
A.2.1	Schedule	47
A.2.2	Implementation	47
A.2.2.1	Protective bonding network	47
A.2.2.2	Dedicated bonding network	47
A.3	Causes of performance deterioration	48
A.3.1.1	Assessment of results	47
A.3.2	Galvanic corrosion	48
A.3.3	Requirements	48
	Bibliography	49

European foreword

This document (EN 50310:2016) was prepared by the 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) 2017–04–11
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2019–04–11

This document supersedes EN 50310:2010.

In 2012, EN 50310:2010 had been offered to ISO/IEC JTC 1/SC 25 “Interconnection of information technology equipment” as input to the agreed project to seek global harmonization of the technical requirements for telecommunications bonding networks. This project, ISO/IEC 30129, has been finished successfully. Thus, TC 215 decided to transpose ISO/IEC 30129 into the fourth edition of EN 50310 with minimal editorial changes to fit European needs. In this context, also the title of EN 50310 has been changed to adopt the title of ISO/IEC 30129.

EN 50310 has been produced within the framework of the following considerations.

- a) With the ongoing growth of the liberalised telecommunication market, the increasing advent of private telecommunication network operators, and the flourishing use of networking computers, the amount of Information Technology equipment installed in buildings and the complexity of these Information Technology installations are permanently growing.
- b) Information Technology equipment is generally installed either as stand-alone equipment (e.g. personal or network computers, small PBXs), or held in racks, cabinets or other mechanical structures (e.g. switching systems, transmission systems, mobile base stations).
- c) CENELEC/SC 64B „Electrical installations and protection against electric shock – Protection against thermal effects“ had decided during their meeting in November 1997 not to harmonize IEC 60364-5-548:1996 *“Electrical installations of buildings – Part 5: Selection and erection of electrical equipment – Section 548: Earthing arrangements and equipotential bonding for information technology installations”*.
- d) This European Standard shall give guidance to network operators, equipment providers and building owners to agree on a standardized bonding configuration that facilitates:
 - compliance of the Information Technology Equipment installation with functional requirements including Electromagnetic Compatibility (EMC) aspects of emission and immunity,
 - compatible building installation and equipment provisions,
 - installation of new equipment in buildings as well as expansion or replacement of installations in existing buildings with equipment coming from different suppliers,
 - a structured installation practice,
 - simple maintenance rules,

- contracting on a common basis,
- harmonization in development, manufacturing, installation and operation.

Sample Document

get full document from standards.iteh.ai

Introduction

This European Standard

- 1) specifies assessment criteria to determine the relevant bonding configurations that are appropriate,
- 2) enables the implementation of any bonding configurations that may be necessary by means of either
 - the provision of a bonding network that utilizes the existing protective bonding network for electrical safety, or
 - the provision of a dedicated bonding network for the telecommunications infrastructure.

This standard is intended for

- building architects, owners and managers,
- designers and installers of electrical and telecommunications cabling installations.

Users of this standard should be familiar with all applicable cabling design and installation standards.

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

- installation specification, quality assurance, planning and installation practices (EN 50174 series);
- generic cabling design (EN 50173 series);
- application dependent cabling design (e.g.  EN 50700 );
- testing of installed cabling (EN 50346);
- this European Standard (EN 50310).

A2

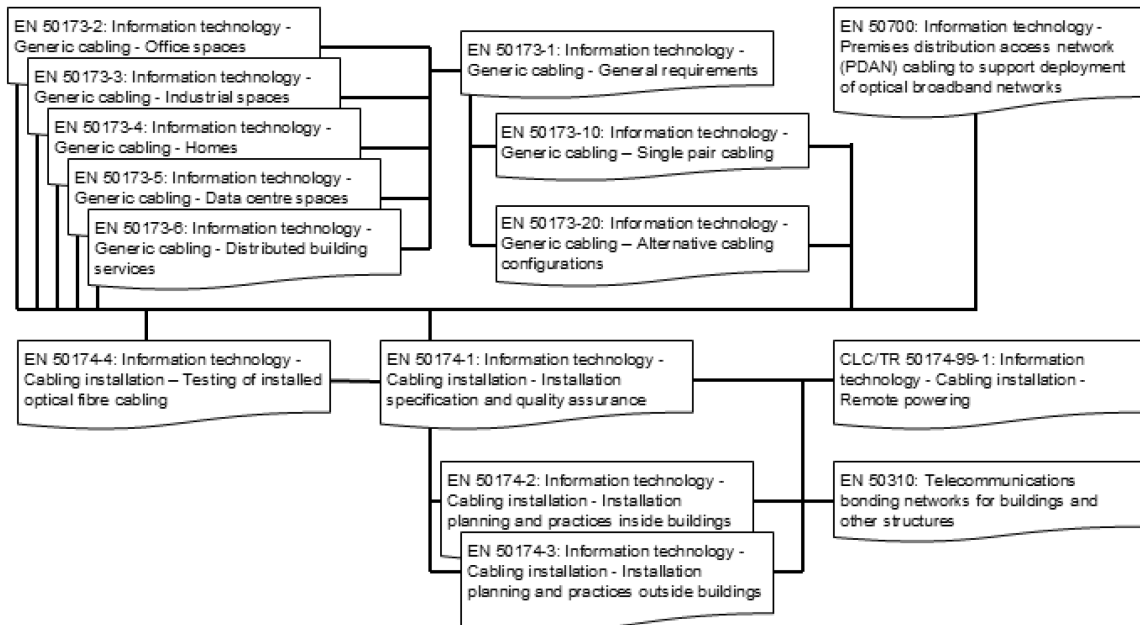


Figure 1 — Schematic relationship between EN 50310 and other relevant standards

A2

A2

Table 1 — Contextual relationship between EN 50310 and other relevant standards

Building design phase	Generic cabling design phase	Specification phase	Installation phase	Operation phase
EN 50310	EN 50173-2	EN 50174-1	EN 50174-2 EN 50174-3 EN 50174-4 EN 50310	EN 50174-1
	EN 50173-3	Planning phase		
	EN 50173-4			
	EN 50173-5			
	EN 50173-6			
	EN 50173-10	EN 50174-2 EN 50174-3 EN 50310		
	EN 50173-20			
	(these ENs reference general requirements of EN 50173-1)			

A2

1 Scope

A2 This document specifies requirements and provides recommendations for the design and installation of connections (bonds) between various electrically conductive elements in buildings and other structures, during their construction or refurbishment, in which information or telecommunications technology equipment is intended to be installed in order to:

- a) minimise the d.c. and a.c. potential differences in order to reduce the risk of malfunction of that equipment and interconnecting cabling due to electromagnetic disturbance; **A2**
- b) provide the telecommunications installation with a reliable signal reference – which may improve immunity from electromagnetic interference (EMI).

The requirements of this European Standard are applicable to the buildings and other structures within premises addressed by EN 50174-2 (e.g. residential, office, industrial and data centres) but information given in this European Standard may be of assistance for other types of buildings and structures.

NOTE Telecommunications centres (operator buildings) are addressed by ETSI/EN 300 253.

This European Standard does not apply to power supply distribution of voltages over AC 1 000 V.

Electromagnetic compatibility (EMC) requirements and safety requirements for power supply installation are outside the scope of this European Standard and are covered by other standards and regulations. However, information given in this European Standard may be of assistance in meeting the requirements of these standards and regulations.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50083 series ¹⁾, *Cable networks for television signals, sound signals and interactive services*

A2 EN 50174-2:2018, *Information technology - Cabling installation - Part 2: Installation planning and practices inside buildings* **A2**

EN 60728 series, *Cable networks for television signals, sound signals and interactive services (IEC 60728 series)*

EN 61140, *Protection against electric shock - Common aspects for installation and equipment (IEC 61140)*

A1

EN 61557-4, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. - Equipment for testing, measuring or monitoring of protective measures - Part 4: Resistance of earth connection and equipotential bonding (IEC 61557-4)*

EN 61557-5, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. - Equipment for testing, measuring or monitoring of protective measures - Part 5: Resistance to earth (IEC 61557-5)*

A1

¹⁾ Being partly replaced by EN 60728 series.

EN 62305-4, *Protection against lightning - Part 4: Electrical and electronic systems within structures (IEC 62305-4)*

HD 60364-4-41, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock (IEC 60364-4-41)*

HD 60364-4-444, *Low-voltage electrical installations – Part 4-444: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances (IEC 60364-4-44)*

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)*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50174-2 and the following apply.

A2 3.1.1

access provider

operator or another entity providing the means to enable external telecommunications service provision to a subscriber

[SOURCE: EN 50700:2023, 3.1.3] **A2**

3.1.2

asymmetric cabling

cabling within which the cable elements are asymmetric (unbalanced)

A2 3.1.3

application

system, with its associated transmission and power feeding method that is supported by telecommunications cabling

[SOURCE: EN 50173-1:2018, 3.1.5] **A2**

3.1.4

backbone bonding conductor

telecommunications bonding connection which interconnects telecommunications bonding backbones

3.1.5

balanced application

application designed and optimized to operate over symmetric cabling

3.1.6

common bonding network

set of interconnected conductive structures that combine the functions of a protective bonding network and a telecommunications bonding network

3.1.7

equipment bonding conductor

conductor that connects a protective bonding network to **A2 Deleted A2** telecommunications equipment

3.1.8**main earthing terminal**

terminal or busbar which is part of the earthing arrangement of an installation and enabling the electric connection of a number of conductors for earthing purposes

[SOURCE: IEC 60050-826:2004, 826-13-15, modified – The terms “main earthing busbar main”, “grounding terminal (US)” and “main grounding busbar (US)” have been deleted.]

 Deleted 

3.1.9**mesh size**

maximum length of conducting material between two adjacent connection points that create the grid of the telecommunications bonding network

3.1.10**primary bonding busbar**

telecommunications bonding connection element, connected to the main earthing terminal, that is used to attach telecommunications bonding backbone conductors and equipment bonding conductors

3.1.11**protective bonding network**

set of interconnected conductive elements to ensure electrical safety

Note 1 to entry: The protective bonding network meets the protective equipotential bonding system as defined in IEC 60050–195:1998, 195.

3.1.12**rack bonding conductor**

conductor that connects a rack bonding busbar or items of equipment within a cabinet, frame or rack to the telecommunications bonding network  Deleted 

3.1.13**rack bonding busbar**

attachment element within a cabinet, frame or rack or for multiple unit bonding conductors

3.1.14**secondary bonding busbar**

telecommunications bonding connection element for telecommunications systems and equipment in the area, served by a distributor

3.1.15**system block**

functional group of equipment depending in its operation and performance on its connection to the same system reference potential plane, inherent to a mesh bonding network

[SOURCE: ETSI/EN 300 253:2015, 3.1.2]

3.1.16**system reference potential plane**

conductive solid plane, as an ideal goal in potential equalizing, that is approached in practice by horizontal or vertical meshes

Note 1 to entry: The mesh width thereof is adapted to the frequency range to be considered. Horizontal and vertical meshes may be interconnected to form a grid structure approximating a Faraday cage.

Note 2 to entry: The SRPP facilitates signalling with reference to a common potential.

[SOURCE: ETSI/EN 300 253:2015, 3.1.2]

3.1.17**symmetric cabling**

screened or unscreened cabling within which the cable elements comprise balanced pairs or quads

EXAMPLE Twisted pairs or quads.

3.1.18**telecommunications bonding backbone**

conductor installed within telecommunications pathways that interconnects a primary bonding busbar to its secondary bonding busbars within the building, and that is intended to minimise potential differences but not intended to serve as a conductor providing a fault current return path

3.1.19**telecommunications bonding conductor**

conductor between the primary bonding busbar and the main earthing terminal

3.1.20**telecommunications bonding network**

set of interconnected conductive elements that provide functional equipotential bonding for telecommunications equipment

3.1.21**telecommunications equipment bonding conductor**

conductor that connects a primary or secondary bonding busbar to a supplementary bonding network, a rack bonding conductor or to  Deleted  telecommunications equipment

3.1.22**telecommunications entrance facility**

entrance point where the telecommunications facilities enter the building

Note 1 to entry: The telecommunications entrance facility may also include antenna cable entrances and electronic equipment serving telecommunications functions.

3.1.23**unbalanced application**

application not optimised for transmission over symmetric cabling

3.1.24**unit bonding conductor**

conductor that connects the telecommunications equipment within a cabinet, frame or rack to the rack bonding busbar or to a rack bonding conductor



3.1.25**high frequency**

frequency of, or greater than, 1 MHz

3.1.26**low frequency**

frequency of less than 1 MHz



**3.1.27****bonding network****BN**

set of interconnected conductive structures that mitigate electromagnetic interference for electronic systems

Note 1 to entry: This document describes four general types of bonding network: star, ring, local mesh, and mesh.

**3.2 Abbreviations**

For the purposes of this document, the following abbreviations apply.

a.c.	alternating current
BBC	Backbone Bonding Conductor
CBN	Common Bonding Network
d.c.	direct current
EMI	ElectroMagnetic Interference
IACS	International Annealed Copper Standard
MESH-BN	MESH Bonding Network
MESH-IBN	MESH Isolated Bonding Network
MET	Main Earthing Terminal
PBB	Primary Bonding Busbar
PBNC	Protective Bonding Network Conductor
RBB	Rack Bonding Busbar
RBC	Rack Bonding Conductor
SBB	Secondary Bonding Busbar
SBG	Supplementary Bonding Grid
SRPP	System Reference Potential Plane
SPC	Single Point Of Connection
TBB	Telecommunications Bonding Backbone
TBC	Telecommunications Bonding Conductor
TEBC	Telecommunications Equipment Bonding Conductor
TEF	Telecommunications Entrance Facility
TSP	Transient Suppression Plate
UBC	Unit Bonding Conductor

4 Conformance

For bonding infrastructures to conform to this European Standard

- a) an assessment in accordance with Clause 6 shall be undertaken,
- b) based on the results of the assessment any necessary bonding shall be implemented as follows

- 1) the backbone and building entrance bonding shall either
 - use the protective bonding network provided that it delivers the performance required by the assessment of Clause 6, or
 - conform to the requirements of Clause 8 for a dedicated bonding system,
 - 2) the local bonding shall either
 - conform to Clause 9 in line with the requirements of the assessment of Clause 6, or
 - conform to the requirements of Clause 10 for a dedicated telecommunications bonding system in line with the requirements of the assessment of Clause 6,
- or
- 3) a mesh bonding network in accordance with Clause 11,
- c) the requirements of Clause 7 shall be applied to all telecommunications bonding networks implemented,
 - d) the cross-sectional areas of bonding conductors shall conform to the requirements of Clauses 7 to 11,
 - e) local regulations, including safety, shall be met.

NOTE The proper implementation of the requirements of this European Standard assumes that electrical installations, protective bonding networks and protective measures against overvoltages are undertaken in accordance with the local regulations, as appropriate. ^[A1] HD 60364-4-444 contains additional information. ^[A1]

get full document from standards.iteh.ai

5 Overview of bonding networks

This European Standard assumes that buildings, or other structures, containing or intended to contain telecommunications equipment are of vertical extent (where a backbone connects zones of different floors) and/or horizontal extent (where a backbone connects multiple zones on a floor) and feature, as follows:

- a) one or more entrance facilities,
- b) one or more identifiable areas within each zone containing concentrations of telecommunications equipment (e.g. spaces associated with the generic cabling distributors of standards supported by EN 50174-2),
- c) areas in each zone within which telecommunications equipment is distributed (e.g. locations associated with the generic cabling outlets of standards supported by EN 50174-2).

For the purposes of this European Standard

- 1) the term “backbone” refers to connections between the areas of concentrations of telecommunications equipment and between any given area of concentration and a main earthing terminal (MET),
- 2) the term “local” refers to connections between a given area of concentration of telecommunications equipment and the area of distributed telecommunications equipment which it serves or other connections within that area.

This is shown schematically in Figure 2 for telecommunications equipment distribution and telecommunications bonding network terminology.