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Information technology - Generic cabling systems - Part 6: Distributed building services

Informationstechnik - Anwendungsneutrale Kommunikationskabelanlagen - Teil 6:
Verteilte Gebäudedienste

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Technologies de l'information - Systèmes de câblage générique - Partie 6 : Services
distribués dans les bâtiments

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Informationstechnik - Anwendungsneutrale
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This European Standard was approved by CENELEC on 2018-03-19. 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.

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European foreword

This document (EN 50173-6:2018) 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) 2019-03-19
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2021-03-19

This document supersedes EN 50173-6:2013.

The European Standards EN 50173:1995 and EN 50173-1:2002 have been developed to enable the application-independent cabling to support ICT applications in office premises. Their basic principles, however, are applicable to other types of applications and in other types of premises.

Therefore, CLC/TC 215 has established relevant European Standards which address the specific requirements of these premises. In order to point out the commonalities of these cabling design standards, these European Standards are published as individual parts of the EN 50173 series, thus also acknowledging that standards users recognize the designation “EN 50173” as a synonym for generic cabling design.

At the time of publication of this European Standard, EN 50173 series comprises the following standards:

EN 50173-1	Information technology — Generic cabling systems — Part 1: General requirements
EN 50173-2	Information technology — Generic cabling systems — Part 2: Office spaces
EN 50173-3	Information technology — Generic cabling systems — Part 3: Industrial spaces
EN 50173-4	Information technology — Generic cabling systems — Part 4: Homes
EN 50173-5	Information technology — Generic cabling systems — Part 5: Data centre spaces
EN 50173-6	Information technology — Generic cabling systems — Part 6: Distributed building services

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This edition of EN 50173-6:

- a) introduces new components 8.1 and 8.2 for balanced cabling to support new channel Classes I and II as well as optical fibre cabling (OM5) as defined in EN 50173-1:2018;
- b) revises Annex B on services and applications;
- c) revises Annex D on optical fibres used in the Type B service distribution type cabling system;
- d) aligns the document structure across the EN 50173 series and updates the document both technically and editorially.

Introduction

The importance of cabling infrastructure is similar to that of other fundamental utilities such as water and energy supply and interruptions to the services provided over that infrastructure can have a serious impact. A lack of design foresight, the use of inappropriate components, incorrect installation, poor administration or inadequate support can threaten quality of service and have commercial consequences for all types of users.

This standard specifies generic cabling for distributed building services and can be used as a stand-alone infrastructure or in conjunction with all the space-specific standards of the EN 50173 series.

It has been prepared to reflect the increasing use of generic cabling in support of non-user specific services and the sharing of information between such services, many of which require the use of remote powered devices. The distribution of these services is implemented either as a stand-alone structure and configuration or as an overlay provided to locations other than those specified by space-specific standards in the EN 50173 series.

This standard is not intended to replace the application of other space-specific standards in EN 50173 series but has been prepared in recognition of the fact that, although certain functional elements of distributed building services cabling can be co-located with those of other generic cabling infrastructures, it can be:

- specified, installed and operated by different entities than those responsible for other generic cabling infrastructures that are to be installed within the premises;
- specified and installed at a different time than other generic cabling infrastructures that are to be installed within the premises.

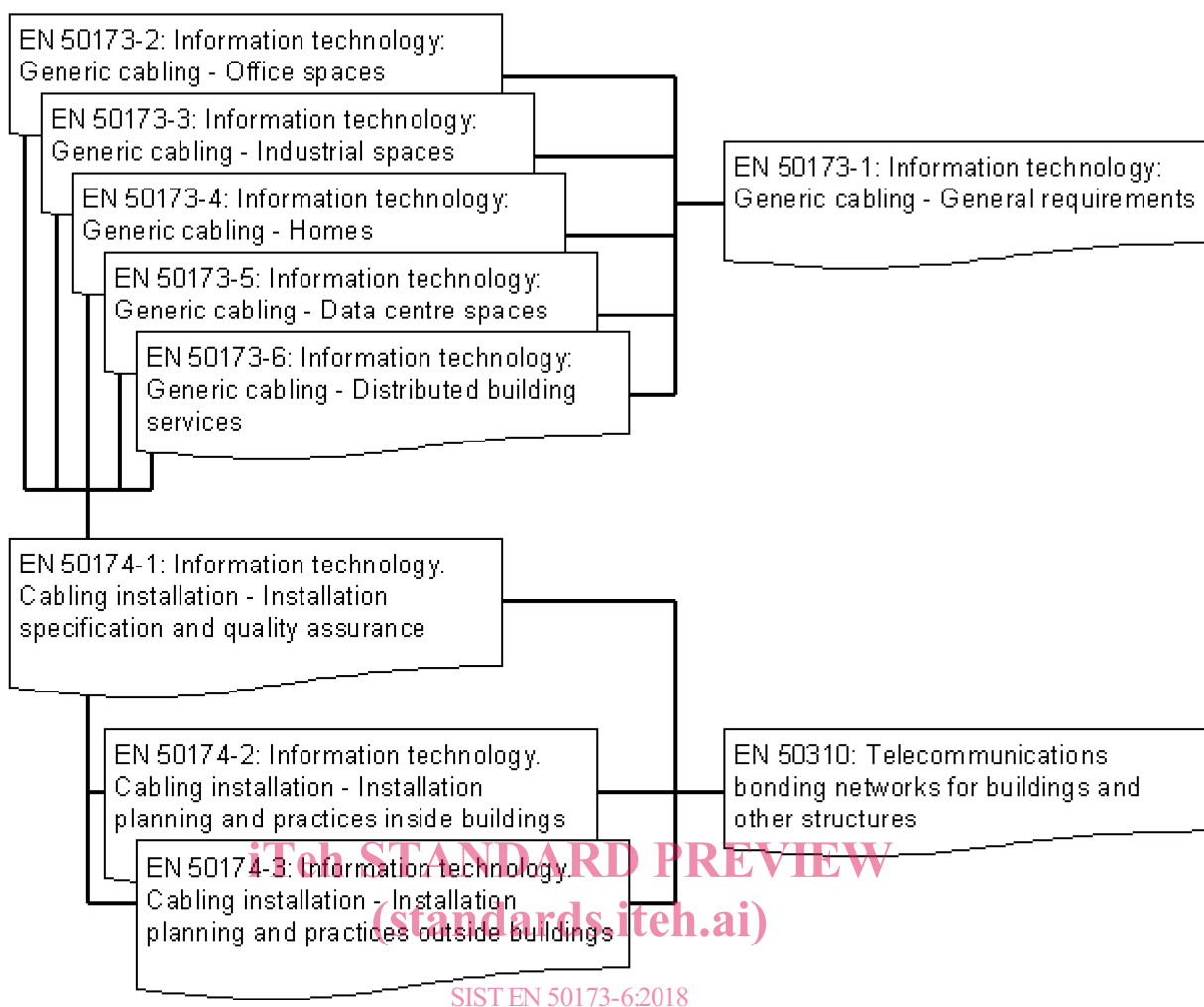
Figure 1 and Table 1 show the schematic and contextual relationships between the standards produced by TC 215 for information technology cabling, namely:

- 1) this and other parts of the EN 50173 series;
- 2) installation (EN 50174 series); [SIST EN 50173-6:2018](https://standards.iteh.ai/catalog/standards/sist/9c645091-d0d1-405a-9429-80f550325472/sist-en-50173-6-2018)
- 3) bonding (EN 50310). <https://standards.iteh.ai/catalog/standards/sist/9c645091-d0d1-405a-9429-80f550325472/sist-en-50173-6-2018>

In addition, a number of Technical Reports have been developed to support or extend the application of these standards, including:

- CLC/TR 50173-99-1, *Cabling guidelines in support of 10 GBASE-T*;
- CLC/TR 50173-99-2, *Information technology — Implementation of BCT applications using cabling in accordance with EN 50173-4*;
- CLC/TR 50173-99-3, *Information technology — Generic cabling systems — Part 99-3: Home cabling infrastructures up to 50 m in length to support simultaneous and non simultaneous provision of applications*.

In addition, a number of cabling design standards have been developed using components of EN 50173-1 (e.g. EN 50098 series and EN 50700).



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Figure 1 — Schematic relationship between the EN 50173 series and other relevant standards

Table 1 — Contextual relationship between EN 50173 series and other standards relevant for information technology cabling systems

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 50310	EN 50174-1
	EN 50173-3	Planning phase		
	EN 50173-4 EN 50173-5 EN 50173-6 (these ENs reference general requirements of EN 50173-1)	EN 50174-2 EN 50174-3 EN 50310		

The generic cabling specified by this standard provides users with:

- an application independent system capable of supporting a wide range of applications in a range of installation and operating environments;
- a flexible scheme such that modifications are both easy and economical;
- a multi-vendor supply chain within an open market for cabling components.

In addition this standard provides:

- a) relevant industry professionals with guidance allowing the accommodation of cabling before specific requirements are known; i.e. in the initial planning either for construction or refurbishment and for further deployment as the requirements of areas are defined;
- b) industry and standardization bodies with a cabling system which supports current products and provides a basis for future product development and applications standardization.

Applications addressed in this standard include the Technical Committees of IEC (including the subcommittees of ISO/IEC JTC 1) and study groups of ITU-T as used to support the following services:

- telecommunications, e.g. wireless access points, distributed antenna systems;
- energy management, e.g. lighting, power distribution, incoming utility metering;
- environmental control, e.g. temperature, humidity;
- personnel management, e.g. access control, cameras, passive infrared (PIR) detectors, time and attendance monitoring, electronic signage, audio-visual (AV) projectors;
- personal information and alarms, e.g. paging, patient monitoring, nurse call, infant security;
- “intelligent” building systems.

Physical layer requirements for the applications listed in EN 50173-1:2018, Annex F, have been analysed to determine their compatibility with the cabling performance specified in this standard and, together with statistics concerning premises geography from different countries and the models described in Clause 4, have been used to develop the requirements for cabling components and to stipulate their arrangement into cabling systems.

As a result, this standard:

- a) specifies a structure for generic cabling supporting a wide variety of applications including, but not restricted to, those in EN 50173-1:2017, Annex F;
- b) adopts balanced cabling channel and link Classes E_A, F and F_A, specified in EN 50173-1;
- c) adopts optical fibre cabling channel and link requirements specified in EN 50173-1;
- d) adopts component requirements, specified in EN 50173-1, and specifies cabling implementations that ensures performance of links and of channels meeting the requirements of a specified group (e.g. Class) of applications.

Life expectancy of generic cabling systems can vary depending on environmental conditions, supported applications, aging of materials used in cables, and other factors such as access to pathways (campus pathways are more difficult to access than building pathways).

With appropriate choice of components, generic cabling systems meeting the requirements of this standard are expected to have a life expectancy of at least ten years.

1 Scope and conformance

1.1 Scope

This standard specifies generic cabling for distributed building services and can be used in conjunction with all the space-specific standards of the EN 50173 series.

It covers balanced cabling and optical fibre cabling.

This standard specifies directly or via reference to EN 50173-1 the:

- structure and minimum configuration for generic cabling for distributed building services;
- interfaces at the service outlet (SO);
- performance requirements for cabling links and channels;
- implementation requirements and options;
- performance requirements for cabling components;
- conformance requirements and verification procedures.

This standard has taken into account requirements specified in application standards listed in EN 50173-1.

Safety and electromagnetic compatibility (EMC) requirements are outside the scope of this standard and are covered by other standards and regulations. However, information given in this standard can be of assistance in meeting these standards and regulations.

1.2 Conformance

For a cabling installation to conform to this standard the following applies:

- a) The configuration and structure shall conform to the requirements of Clause 4.
- b) Channels shall meet the requirements of Clause 5.

This shall be achieved by one of the following:

- 1) a channel design and implementation ensuring that the prescribed channel performance of Clause 5 is met;
 - 2) attachment of appropriate components to a permanent link or SCP link design meeting the prescribed performance class of Annex A. Channel performance shall be ensured where a channel is created by adding more than one cord to either end of a link meeting the requirements of Annex A;
 - 3) for E₁ environments, using the reference implementations of Clause 6 and compatible cabling components conforming to the requirements of Clauses 7, 8 and 9 based upon a statistical approach of performance modelling.
- c) The interfaces to the cabling at the SO shall conform to the requirements of Clause 8 with respect to mating interfaces and performance.
 - d) Connecting hardware at other places in the cabling structure shall meet the performance requirements specified in Clause 8 independent of the interface used.
 - e) The requirements of EN 50174 series standards and EN 50310 shall be met.
 - f) Local regulations, including those concerning safety and EMC, shall be met.

This standard does not specify which tests and sampling levels should be adopted. Test methods to assess conformance with the channel and link requirements of Clause 5 and Annex A respectively are specified in EN 50173-1. The test parameters to be measured, the sampling levels and the treatment of measured results to be applied for a particular installation shall be defined in the installation specification and quality plans for that installation prepared in accordance with EN 50174-1.

In the absence of the channel, the conformance of the link shall be used to verify conformance with the standard.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 50173-1:2018, *Information technology — Generic cabling systems — Part 1: General requirements*

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*

EN 61076-3-106:2006, *Connectors for electronic equipment — Product requirements — Part 3-106: Rectangular connectors — Detail specification for protective housings for use with 8-way shielded and unshielded connectors for industrial environments incorporating the IEC 60603-7 series interface (IEC 61076-3-106:2006)*

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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 50173-1, EN 50174-1 and the following apply.

3.1.1

building service

non-user specific service within premises including, but not restricted to, building automation, security, access control, building management, wireless access points, information displays and alarm systems

3.1.2

distributed building service

building service provided to locations additional to those specified in premises-specific standards in EN 50173 series

3.1.3

network conversion interface

passive or active device allowing the attachment of cabling of different network topologies to a service concentration point

3.1.4

service area

area in a room or other space where non-user specific equipment is placed and connected to the same SCP or groups of SOs

EN 50173-6:2018 (E)**3.1.5****service area cord**

cord connecting the service outlet to the terminal equipment

3.1.6**service concentration point**

connection point in the Type A generic cabling between a service distributor and a service outlet or a connection point offering connections to terminal equipment at the end of Type B generic cabling

3.1.7**service concentration point cable**

cable between a service concentration point and a service outlet

3.1.8**service distribution cable**

cable connecting the service distributor to the service outlet(s) or service concentration point(s) of Type A cabling

3.1.9**service outlet**

fixed connecting device where the service distribution cabling terminates

3.2 Abbreviations

For the purposes of this document, the abbreviations given in EN 50173-1 and the following apply.

AV	Audio-visual
DAS	Distributed Antenna System
OE EQP	Opto-electronic equipment
PIR	Passive Infrared
RFID	Radio Frequency Identification
SCP	Service Concentration Point
SD	Service Distributor
SO	Service Outlet
TE	Terminal Equipment
WAP	Wireless Access Point

4 Structure of the generic cabling for distributed building services**4.1 General**

This clause identifies the functional elements of generic cabling, describes how they are connected together to form subsystems and identifies the interfaces at which application-specific components are connected to the generic cabling infrastructure. Applications listed in EN 50173-1:2018, Annex F, are supported by connecting active equipment to the generic cabling.

In general, all functional elements, subsystems and interfaces from the campus distributor to the floor distributor as described in EN 50173-1 are applicable.

4.2 Functional elements

4.2.1 Stand-alone structure

In addition to the functional elements specified in EN 50173-1, this European Standard specifies two implementations of generic cabling for distributed building services. This European Standard enables:

- a) Type A generic cabling to the SO;
- b) Type B generic cabling to the SCP, thereby providing the opportunity for:
 - application-specific cabling to be installed between the SCP and terminal equipment;
 - application-specific equipment to be connected at the SCP.

The specification of application-specific cabling and equipment connected to the SCP is outside the scope of the European Standard.

Type A generic cabling uses the following functional elements and interfaces:

- 1) service distributor (SD);
- 2) service distribution cable;
- 3) service concentration point (SCP);
- 4) service concentration point cable (SCP cable);
- 5) service outlet (SO).

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Type B generic cabling uses the following functional elements and interfaces:

- i) service distributor (SD);
- ii) service distribution cable;
- iii) service concentration point (SCP).

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Groups of these functional elements are connected together with those of EN 50173-1 to form cabling subsystems (see 4.3).

4.2.2 Overlay structure

The structure of Type A and Type B generic cabling in association with generic cabling of other standards in EN 50173 series is described in Annex C.

4.3 Structure and hierarchy

4.3.1 Type A generic cabling

4.3.1.1 Stand-alone structure

Type A generic cabling systems contain up to three cabling subsystems: campus backbone, building backbone and service distribution cabling. The cabling subsystems are connected together to create a generic cabling system with a structure as shown in Figure 2. The composition of the cabling subsystems is described in 4.4.1, 4.4.3.1 and 4.4.3.2. The functional elements of the cabling subsystems are interconnected to form a basic hierarchical topology as shown in Figure 3.

Where the functions of distributors are combined (see 4.8.1), the intermediate cabling subsystem(s) are not required.