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Information technology - Generic cabling systems - Part 3: Industrial premises

Informationstechnik - Anwendungsneutrale Kommunikationskabelanlagen - Teil 3: Industriell genutzte Standorte

Technologies de l'information - Systemes de câblage générique - Partie 3: Bâtiments du secteur industriel

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Information technology - Generic cabling systems - Part 3: Industrial premises

Technologies de l'information - Systèmes de câblage générique - Partie 3: Bâtiments du secteur industriel

Informationstechnik - Anwendungsneutrale Kommunikationskabelanlagen - Teil 3: Industriell genutzte Standorte

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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: rue de Stassart 35, B - 1050 Brussels

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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 50173-3 on 2007-09-01.

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)	2008-09-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2010-09-01

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.

TC 215 has decided to establish relevant European Standards which address the specific requirements of these premises. In order to point out the commonalities of these cabling design standards, these EN are published as individual parts of the series EN 50173, 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, series EN 50173 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 premises
EN 50173-3	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

This European Standard, EN 50173-3, contains specific requirements for generic cabling systems intended to be operated in industrial premises, referencing the general requirements of EN 50173-1:2007. It is based upon but is not identical to ISO/IEC 24702:2006, Information technology - Generic cabling - Industrial premises.

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Introduction

The importance of the information technology cabling infrastructure is similar to that of other utilities such as heating, lighting and electricity supplies. As with other utilities, interruptions to service can have 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.

Historically, the cabling within premises comprised both application-specific and multipurpose networks. Standards within the EN 50173 series have enabled a controlled migration to generic cabling (with an associated reduction in the use of application-specific cabling) and supported the development of high data rate applications based upon defined cabling models.

This European Standard, EN 50173-3, recognizes the benefit of generic cabling to interconnect several pieces of apparatus within industrial premises (within and between structures and buildings) and is to be read in conjunction with EN 50173-1.

This European Standard provides, for industrial premises:

a) users with an application independent generic cabling system and an open market for cabling components;

b) requirements for infrastructures that support critical automation, process control and monitoring applications in a range of industrial environments;

c) users with a flexible cabling scheme such that modifications are both easy and economical;

d) building professionals (for example, architects), production and control engineers with guidance allowing the accommodation of cabling both before specific requirements are known, i.e. in the initial planning either for construction or refurbishment, and for further deployment as the requirements of specific industrial areas are defined;

e) industry and standardisation bodies with a cabling system which supports current products and provides a basis for future product development and applications standardisation.

This European Standard specifies multi-vendor cabling, and is related to:

- the associated standard covering general requirements for generic cabling within premises (EN 50173-1);

- standards for cabling components developed by Technical Committees of CENELEC and/or IEC;

- standards for the quality assurance and installation of information technology cabling (series EN 50174) and testing of installed cabling (EN 50346);

- applications developed by the technical bodies of IEC (including the subcommittees of ISO/IEC JTC 1), study groups of ITU-T and CENELEC TC 65CX “Fieldbus”.

Within this European Standard the cabling, defined between the interfaces shown in Figure 1, contains passive components only.

The applications listed in EN 50173-1:2007, Annex F, have been analysed to determine the requirements for a generic cabling system. These requirements, together with statistics concerning premises geography from different countries and the models described in Clause 6, have been used to develop the requirements for cabling components and to stipulate their arrangement into cabling systems. As a result, generic cabling defined within this European Standard is targeted at, but not limited to, industrial premises.

It is anticipated that the generic cabling system meeting the minimum requirements of this European Standard will have a life expectancy consistent with other infrastructures within industrial premises.

Figure 1 shows the relationship of generic cabling to the OSI reference model.

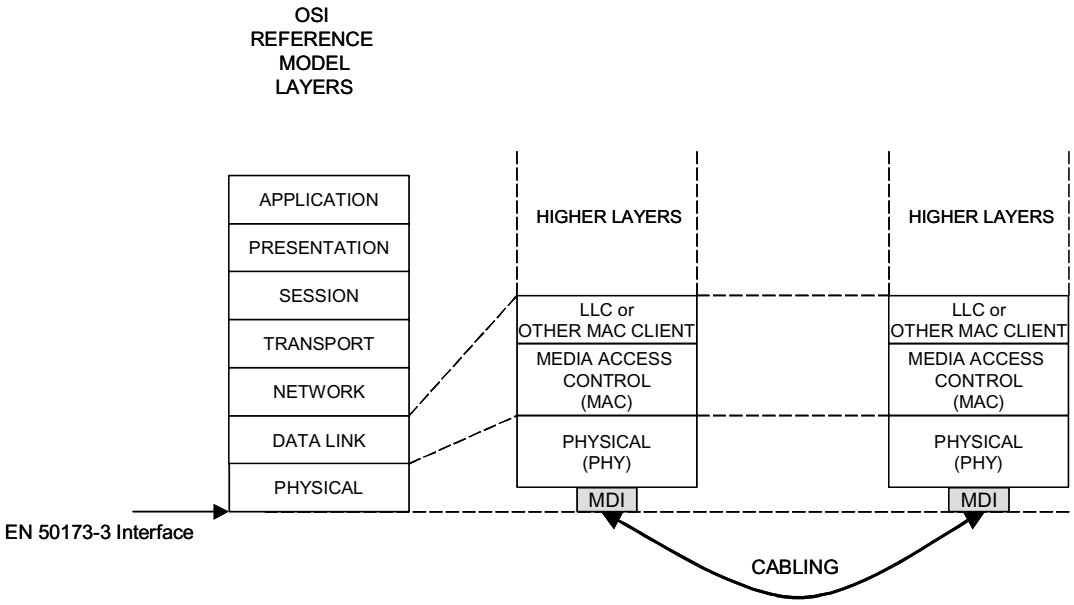

Figure 1 - Cabling specified by EN 50173-3 and its relationship to OSI reference model layers

Figure 2 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) application dependent cabling design (e.g. EN 50098 series);

3) installation (EN 50174 series);

4) testing of installed cabling (EN 50346);

5) equipotential bonding requirements (EN 50310).

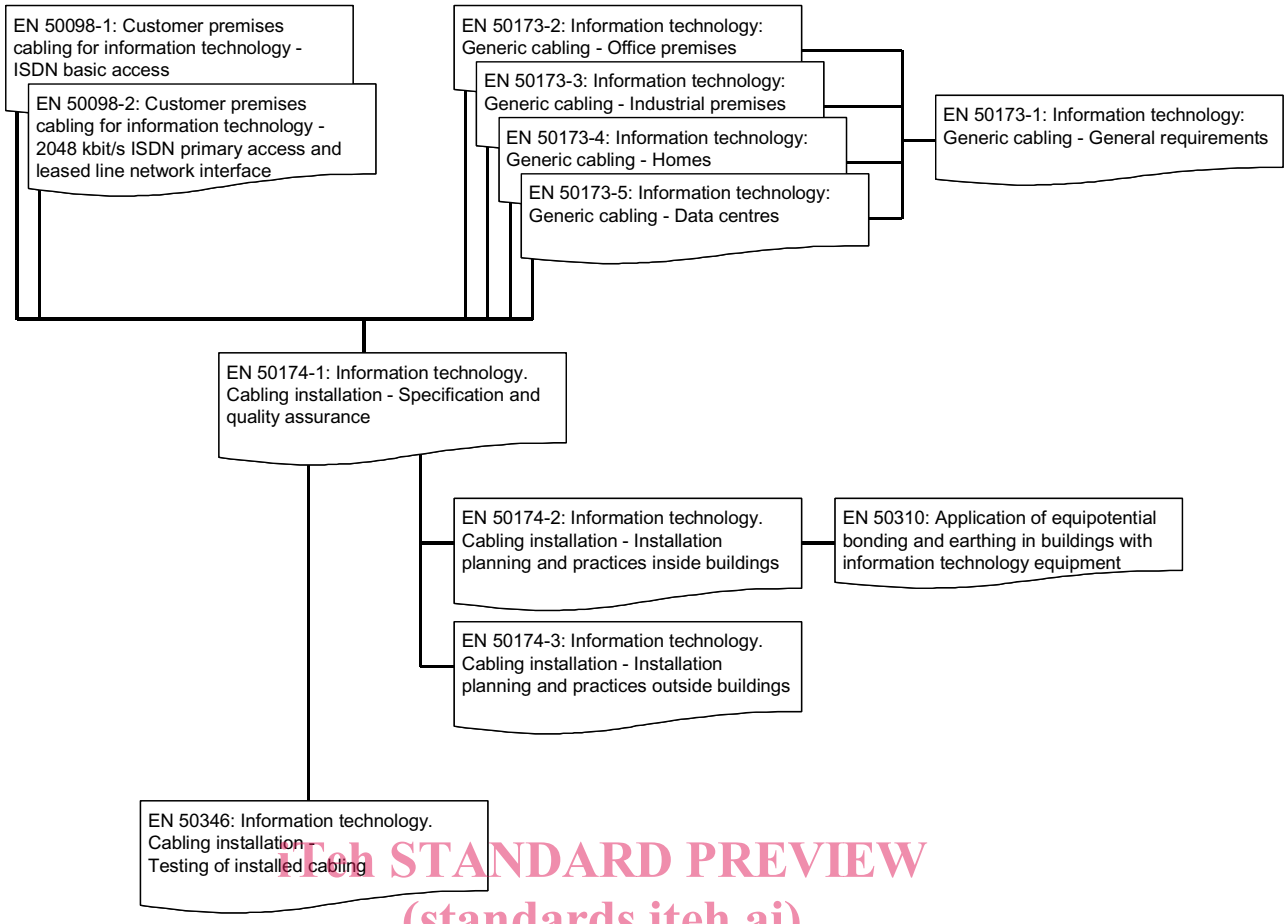

Figure 2 - Schematic relationship between the EN 50173 series and other relevant Standards

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 5.2: Common bonding network (CBN) within a building 6.3: AC distribution system and bonding of the protective conductor (TN-S)	**EN 50173 series except EN 50173-4** 4: Structure 5: Channel performance 7: Cable requirements 8: Connecting hardware requirements 9: Requirements for cords and jumpers A: Link performance limits **and EN 50173-4** 4 and 5: Structure 6: Channel performance 8: Cable requirements 9: Connecting hardware requirements 10: Requirements for cords and jumpers A: Link performance limits	**EN 50174-1** 4: Requirements for installers 5: Requirements for premises owners **Planning phase** **EN 50174-2** 5: Requirements for planning installations of information technology cabling 6: Segregation of metallic information technology and mains power cabling 7: Additional considerations **and EN 50174-3** **and (for equipotential bonding) EN 50310** 5.2: Common bonding network (CBN) within a building 6.3: AC distribution system and bonding of the protective conductor (TN-S)	**EN 50174-2** 4: Requirements for installers of information technology cabling 6: Segregation of metallic information technology and mains power cabling **and EN 50174-3** **and (for equipotential bonding) EN 50310** 5.2: Common bonding network (CBN) within a building 6.3: AC distribution system and bonding of the protective conductor (TN-S) **and EN 50346** 4: General requirements 5: Test parameters for balanced cabling 6: Test parameters for optical fibre cabling	**EN 50174-1** 5: Requirements for premises owners

1 Scope and conformance

1.1 Scope

This European Standard specifies generic cabling that supports a wide range of communications services including automation, process control and monitoring applications for use within industrial premises comprising single or multiple buildings on a campus. It covers balanced cabling and optical fibre cabling.

This European Standard is based upon and references the requirements of EN 50173-1. This European Standard contains additional requirements that are appropriate to industrial premises in which the maximum distance over which communications services have to be distributed is 10 000 m. The principles of this European Standard may also be applied to installations that do not fall within this range.

In addition to the requirements of EN 50173-1, this European Standard specifies:

a) a modified structure and configuration for generic cabling within industrial premises in which information technology applications are used to support process monitoring and control functions;

b) implementation options;

c) additional requirements that reflect the range of operating environments within industrial premises.

Safety (electrical safety and protection, optical power, fire, etc.) and electromagnetic compatibility (EMC) requirements 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 these Standards and regulations.

1.2 Conformance

For a cabling system to conform to this European Standard:

a) the structure and configuration shall conform to the requirements of Clause 4;

b) the interfaces to the cabling at the telecommunications outlet shall conform to the requirements of Clause 8 with respect to mating interfaces and performance;

c) connecting hardware at other places in the cabling structure shall conform to the requirements of Clause 8;

d) the performance of channels[1)] shall conform to the applicable transmission performance requirements of Clause 5. This shall be achieved by one of the following:

- a channel design and implementation ensuring that the prescribed channel performance Class of Clause 5 is met;

- attachment of appropriate components to a permanent link design meeting the prescribed performance Class of Annex A. Channel performance shall be assured where a channel is created by adding more than one cord to either end of a permanent link meeting the requirements of Annex A;

- 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.

e) local regulations concerning safety and electromagnetic emissions shall be met.

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1) This term, as defined in EN 50173-1, refers to the passive cabling between the interfaces described in Clauses 4 and 5. Different definitions of the term “channel” as given in other standards are not applicable in this European Standard.

In addition the following requirements of the EN 50174 series of Standards shall be met:

f) installation specification and quality planning to address:

- the test parameters to be measured;
- the sampling levels to be applied;
- the treatment of channels or links which fail to meet requirements or for which test results lie within the relevant measurement accuracy;

g) administration;

h) installation.

Test methods to verify conformance with the channel and link requirements of Clause 5 and Annex A respectively are specified in EN 50346. Neither this Standard nor EN 50174-1 specify the test and sampling levels to be adopted.

Specifications marked "ffs" (for further study) in EN 50173-1 are preliminary and are not required for conformance to this European Standard.

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.

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

EN 50174-1, *Information technology – Cabling installation – Part 1: 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)*

EN 61754-20, *Fibre optic connector interfaces – Part 20: Type LC connector family (IEC 61754-20)*

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this European Standard the following definitions apply in addition to those of EN 50173-1.

3.1.1
apparatus
one or more pieces of equipment having specific and defined overall functions within industrial premises served by one or more network interfaces

3.1.2
apparatus attachment cord
cord used to connect a telecommunications outlet (TO) to a network interface

3.1.3
automation island
cabling together with active and passive components within apparatus served by a network interface

3.1.4
bulkhead
a wall or barrier which maintains the ingress and climatic environmental classifications applicable on either side

3.1.5
floor cable
cable connecting the floor distributor to the intermediate distributor

3.1.6
intermediate cable
cable connecting the intermediate distributor to the telecommunications outlet (TO)

3.1.7
intermediate distributor
the distributor used to make connections between the intermediate cable, other cabling subsystems and active equipment

3.1.8
network interface
the interface between the apparatus attachment cabling and the apparatus or the automation island network

3.1.9
telecommunications
branch of technology concerned with the transmission, emission and reception of signs, signals, writing, images and sounds; that is, information of any nature by cable, radio, optical or other electromagnetic systems

NOTE The term “telecommunications” has no legal meaning when used in this document; in the context of this Standard the term “telecommunications” includes the transmission of information in support of automation, process control and monitoring applications.

3.1.10
telecommunications outlet (TO)

a fixed connecting device where the intermediate cable terminates and which provides the interface to the apparatus attachment cord

3.2 Abbreviations

For the purposes of this European Standard the following abbreviations apply in addition to those of EN 50173-1.

ID	intermediate distributor
NI	network interface
TO	telecommunications outlet