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Information technology — Data centre facilities and infrastructures —

Part 5: Telecommunications cabling infrastructure

Technologie de l'information — Installation et infrastructures de centres de traitement de données —

Partie 5: Infrastructure du câblage dédié télécommunications



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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 39, *Sustainability for and by Information Technology.*

A list of all parts in the ISO/IEC TS 22237 series can be found on the ISO website.

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Introduction

The unrestricted access to internet-based information demanded by the information society has led to an exponential growth of both internet traffic and the volume of stored/retrieved data. Data centres are housing and supporting the information technology and network telecommunications equipment for data processing, data storage and data transport. They are required both by network operators (delivering those services to customer premises) and by enterprises within those customer premises.

Data centres need to provide modular, scalable and flexible facilities and infrastructures to easily accommodate the rapidly changing requirements of the market. In addition, energy consumption of data centres has become critical both from an environmental point of view (reduction of carbon footprint) and with respect to economical considerations (cost of energy) for the data centre operator.

The implementation of data centres varies in terms of:

a) purpose (enterprise, co-location, co-hosting or network operator facilities);

b) security level;

c) physical size;

d) accommodation (mobile, temporary and permanent constructions).

The needs of data centres also vary in terms of availability of service, the provision of security and the objectives for energy efficiency. These needs and objectives influence the design of data centres in terms of building construction, power distribution, environmental control and physical security. Effective management and operational information is required to monitor achievement of the defined needs and objectives.

The ISO/IEC TS 22237 series specifies requirements and recommendations to support the various parties involved in the design, planning, procurement, integration, installation, operation and maintenance of facilities and infrastructures within data centres. These parties include:

1) owners, facility managers, ICT managers, project managers, main contractors;

2) architects, building designers and builders, system and installation designers;

3) facility and infrastructure integrators, suppliers of equipment;

4) installers, maintainers.

At the time of publication of this document, the ISO/IEC TS 22237 series will comprise the following documents:

ISO/IEC TS 22237-1, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*

ISO/IEC TS 22237-2, *Information technology — Data centre facilities and infrastructures — Part 2: Building construction*

ISO/IEC TS 22237-3, *Information technology — Data centre facilities and infrastructures — Part 3: Power distribution*

ISO/IEC TS 22237-4, *Information technology — Data centre facilities and infrastructures — Part 4: Environmental control*

ISO/IEC TS 22237-5, *Information technology — Data centre facilities and infrastructures — Part 5: Telecommunications cabling infrastructure*

ISO/IEC TS 22237-6, *Information technology — Data centre facilities and infrastructures — Part 6: Security systems*

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ISO/IEC TS 22237-7, *Information technology — Data centre facilities and infrastructures — Part 7: Management and operational information*

The inter-relationship of the specifications within the ISO/IEC TS 22237 series is shown in Figure 1.

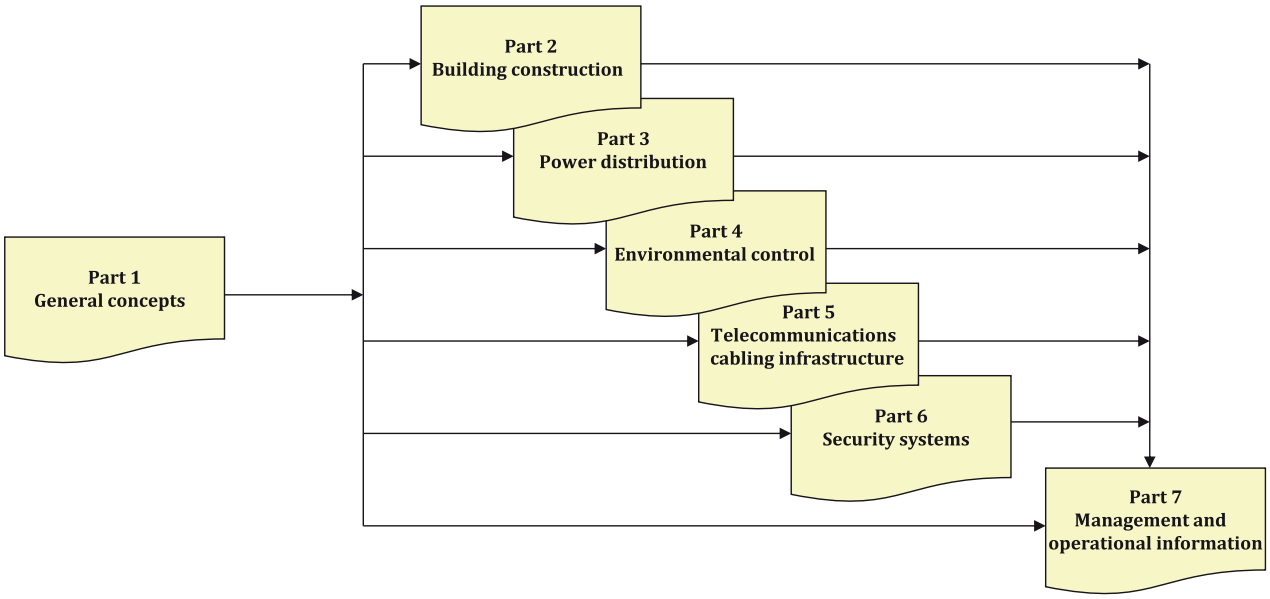


Figure 1 — Schematic relationship between the ISO/IEC TS 22237 series of documents

ISO/IEC TS 22237-2 to ISO/IEC TS 22237-6 specify requirements and recommendations for particular facilities and infrastructures to support the relevant classification for “availability”, “security” and “energy efficiency enablement” selected from ISO/IEC TS 22237-1.

This document addresses the specific requirements for the telecommunications cabling infrastructure in data centres used for the purpose of IT networking and building services (in accordance with the requirements of ISO/IEC TS 22237-1).

ISO/IEC TS 22237-7 addresses the operational and management information (in accordance with the requirements of ISO/IEC TS 22237-1.

This document is intended for use by and collaboration between architects, building designers and builders, system and installation designers.

The ISO/IEC TS 22237 series does not address the selection of information technology and network telecommunications equipment, software and associated configuration issues.

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Information technology — Data centre facilities and infrastructures —

Part 5: Telecommunications cabling infrastructure

1 Scope

This document addresses the wide range of telecommunications cabling infrastructures within data centres based upon the criteria and classifications for "availability" within ISO/IEC TS 22237-1.

This document specifies requirements and recommendations for the following:

a) information technology and network telecommunications cabling (e.g. SAN and LAN);

b) general information technology cabling to support the operation of the data centre;

c) telecommunications cabling to monitor and control, as appropriate, power distribution, environmental control and physical security of the data centre;

d) other building automation cabling;

e) pathways, spaces and enclosures for the telecommunications cabling infrastructures.

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

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.

ISO/IEC 11801-1, *Information technology — Generic cabling systems — Part 1: General requirements*

ISO/IEC 11801-2, *Information technology — Generic cabling systems — Part 2: Office premises*

ISO/IEC 11801-5, *Information technology — Generic cabling systems — Part 5: Data centres*

ISO/IEC 11801-6, *Information technology — Generic cabling systems — Part 6: Distributed building services*

ISO/IEC 14763-2, *Information technology — Implementation and operation of customer premises cabling — Part 2: Planning and installation*

ISO/IEC TS 22237-1:2018, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*

ISO/IEC TS 22237-2, *Information technology — Data centre facilities and infrastructures — Part 2: Building construction*

ISO/IEC TS 22237-4, *Information technology — Data centre facilities and infrastructures — Part 4: Environmental control*

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ISO/IEC TS 22237-7, *Information technology — Data centre facilities and infrastructures — Part 7: Management and operational information*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC TS 22237-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
application-specific cabling
structured cabling with a configuration and performance which is considered to provide a specific benefit for a single, or limited number of applications, as compared to generic cabling

3.1.2
central patching location
passive cross-connect to connect different functional elements of a data centre

Note 1 to entry: A central patching location can be located in the main distribution area and/or the intermediate distribution area and is therefore a special configuration of an MD and/or an ID.

3.1.3
cross-connect
method of connecting a patch panel port to another patch panel port by the use of a patch cord or jumper

3.1.4
data centre information technology equipment
equipment in the computer room space of a data centre that transports and/or stores and/or processes information

3.1.5
fixed cabling
cabling subsystem between closures which has either a peer-to-peer or hierarchical structure and which enables the installation of cross-connects or interconnects at those closures

3.1.6
generic cabling
structured telecommunications cabling system, capable of supporting a wide range of applications

Note 1 to entry: Application-specific hardware is not a part of generic cabling.

Note 2 to entry: Generic cabling can be installed without prior knowledge of the required applications.

[SOURCE: ISO/IEC 11801-1:2017, 3.1.46 — modified: Notes 1 and 2 to entry added]

3.1.7
interconnect
method of connecting a patch panel port to an equipment port by the use of equipment cords

3.1.8
office network information technology equipment
equipment in data centre spaces that transports and/or stores and/or processes information

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3.1.9
point-to-point connection
direct connection of two pieces of IT equipment using a dedicated cable rather than a generic cabling system

3.1.10
structured cabling
telecommunications cabling comprising fixed cables between points of distribution at which equipment or other fixed cables may be connected

3.1.11
telecommunications provider
either an access provider or a service provider

3.1.12
zone patching location
passive cross-connect to connect different function elements of a data centre zone

Note 1 to entry: A zone patching location can be located in the zone distribution area and is therefore a special configuration of a ZD.

3.2 Abbreviated terms

For the purposes of this document, the abbreviated terms given in ISO/IEC TS 22237-1 and the following abbreviated terms apply.

BEF Building Entrance Facility

BD Building Distributor

C Connection

CD Campus Distributor

CP Consolidation Point

CPL Central Patching Location

ENI External Network Interface

EO Equipment Outlet

EoR End of Row

EQP Transmission Equipment

FD Floor Distributor

ID Intermediate Distributor

LDP Local Distribution Point

MD Main Distributor

MoR Middle of Row

SCP Service Concentration Point

SD Service Distributor

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SO Service Outlet

TE Terminal Equipment

TO Telecommunications Outlet

ToR Top of Rack

ZD Zone Distributor

ZPL Zone Patching Location

4 Conformance

For a data centre to conform to this document:

a) the cabling design shall meet the requirements of Clause 5;

b) the cabling design for the selected Availability Class shall be in accordance with Clause 7;

c) the design and specifications of pathways and spaces shall be in accordance with Clauses 8 and 9;

d) the information technology cabling to support the operation of the data centre shall be in accordance with ISO/IEC 11801-2, except where 7.3 allows an alternative approach;

e) the information technology cabling to support the IT networking function of the data centre shall be in accordance with ISO/IEC 11801-5, except where 7.2 allows an alternative approach;

f) telecommunications cabling for monitoring and/or control of power distribution, environmental control and physical security shall be in accordance with ISO/IEC 11801-6, except where 7.4 allows an alternative approach;

g) installation specification, quality assurance, installation planning and practice of cabling shall be in accordance with ISO/IEC 14763-2 and Clauses 8 and 9;

h) national and local regulations, including safety, shall be met.

5 Telecommunications cabling within the data centre

5.1 General

5.1.1 The importance of telecommunications cabling within data centre spaces

The telecommunications cabling within the data centre serves to support the following:

a) data centre information technology and network telecommunications;

b) monitoring and controlling of other data centre infrastructures;

c) building management and automation.

The design and planning of cabling infrastructures should be undertaken at an early stage of the data centre design or refurbishment and should be integrated with the design and planning of:

1) electrical power;

2) environmental control systems;

3) security systems;

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