

TECHNICAL SPECIFICATION

ISO/IEC TS
22237-5

First edition
2018-05

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



Reference number
ISO/IEC TS 22237-5:2018(E)

© ISO/IEC 2018



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviations	2
3.1 Terms and definitions	2
3.2 Abbreviated terms	3
4 Conformance	4
5 Telecommunications cabling within the data centre	4
5.1 General	4
5.1.1 The importance of telecommunications cabling within data centre spaces	4
5.1.2 Cabling implementation	5
5.1.3 Point-to-point cabling	5
5.1.4 Fixed cabling	6
5.2 Information technology and network telecommunications cabling in the computer room space	7
5.2.1 General	7
5.2.2 Generic cabling for data centre information technology equipment	8
5.2.3 Generic cabling for office network information technology equipment	9
5.2.4 Generic cabling for monitoring and control	9
5.2.5 Application-specific fixed cabling	10
5.3 Structured cabling for other data centre spaces and application-specific structured cabling	10
5.3.1 General	10
5.3.2 Application-specific cabling using a fixed infrastructure	10
6 Availability design principles for telecommunications cabling infrastructure	11
7 Availability classification for telecommunications cabling infrastructure	11
7.1 General	11
7.2 Telecommunications cabling for the computer room	12
7.2.1 Cabling for Availability Class 1	12
7.2.2 Cabling for Availability Class 2	13
7.2.3 Cabling for Availability Class 3	14
7.2.4 Cabling for Availability Class 4	15
7.3 Telecommunications cabling for offices	16
7.4 Telecommunications cabling for monitoring and control	16
8 Pathways and pathway systems for telecommunications cabling	16
8.1 General	16
8.2 Pathways	17
8.2.1 External service pathways	17
8.2.2 Data centre pathways	17
8.3 Pathway systems	18
8.3.1 Requirements for data centre pathway systems	18
8.3.2 Access floor tile openings	18
8.3.3 Cable management systems	18
9 Cabinets and racks for the computer room space	19
9.1 General requirements	19
9.2 Requirements for dimensions	19
9.3 Recommendations	19
10 Documentation and quality plan	20
10.1 Requirements for documentation	20

10.2	Recommendations for documentation.....	20
10.3	Requirements for the quality plan	20
11	Management and operation of the telecommunications cabling infrastructure	20
11.1	General	20
11.2	Automated infrastructure management systems	20
11.3	Fibre optic cabling.....	20
Annex A (normative) Cabling design concepts		21
Annex B (informative) Energy efficiency considerations for the telecommunications cabling infrastructure		29
Bibliography.....		30

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.

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*

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](#).

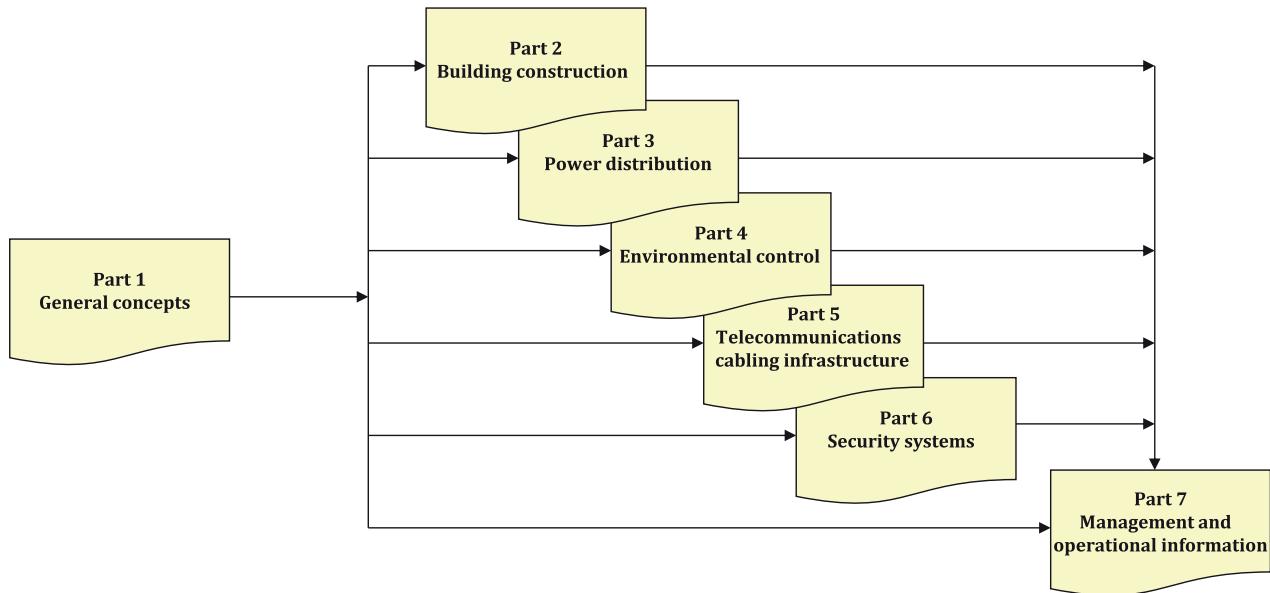


Figure 1 — Schematic relationship between the ISO/IEC TS 22237 series of documents

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.

This is a preview - click here to buy the full publication

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*

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