
**Information technology — Data centre
facilities and infrastructures —**

**Part 1:
General concepts**

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

Partie 1: Concepts généraux

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Published in Switzerland

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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.

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 or www.iec.ch/members_experts/refdocs).

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) or the IEC list of patent declarations received (see patents.iec.ch).

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

For an explanation of 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 www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 39, *Sustainability, IT & Data Centres*.

This first edition cancels and replaces the first edition (ISO/IEC TS 22237-1:2018), which has been technically revised.

The main changes are as follows:

- reference to Key Performance Indicators of ISO/IEC 30134 series has been included;
- [Clause 7](#) (Availability) has been revised;
- the design processes ([Clause 8](#)) and design principles ([Clause 9](#)) have been moved from an annex to the main body of the document;
- the existing [Annex A](#) has been removed;
- new [Annexes A](#) and [B](#) have been added.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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 economic 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; and
- d) accommodation (mobile, temporary and permanent constructions).

NOTE Cloud services can be provided by all data centre types mentioned.

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, telecommunications cabling and physical security. Effective management and operational information are required to monitor achievement of the defined needs and objectives.

The ISO/IEC 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, operators, facility managers, ICT managers, project managers, main contractors;
- 2) consultants, architects, building designers and builders, system/installation designers, auditors, test and commissioning agents;
- 3) suppliers of equipment; and
- 4) installers, maintainers.

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

- ISO/IEC 22237-1 (this document), *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 22237-3, *Information technology — Data centre facilities and infrastructures — Part 3: Power distribution*;
- ISO/IEC 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 22237 series is shown in [Figure 1](#).

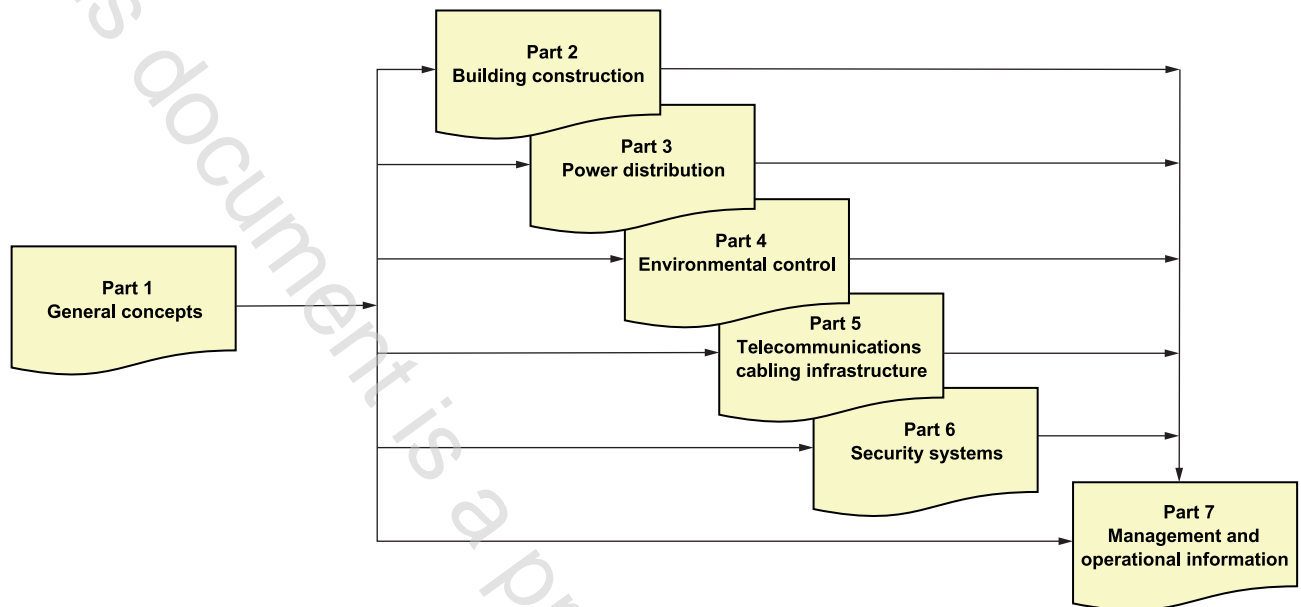


Figure 1 — Schematic relationship between the ISO/IEC 22237 series of documents

This document, ISO/IEC 22237-1, defines the general concepts for the design and operation of data centres. This includes a business risk and operational cost analysis as well as a classification system for data centres with respect to “availability”, “physical security” and “energy efficiency enablement”.

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”, “physical security” and “energy efficiency enablement” selected from ISO/IEC 22237-1 (this document).

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

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

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

Information technology — Data centre facilities and infrastructures —

Part 1: General concepts

1 Scope

This document:

- a) describes the general principles for data centres upon which the requirements of the ISO/IEC 22237 series are based;
- b) defines the common aspects of data centres including terminology, parameters and reference models (functional elements and their accommodation) addressing both the size and complexity of their intended purpose;
- c) describes general aspects of the facilities and infrastructures required to support data centres;
- d) specifies a classification system, based upon the key criteria of “availability”, “security” and “energy-efficiency” over the planned lifetime of the data centre, for the provision of effective facilities and infrastructure;
- e) details the issues to be addressed in a business risk and operating cost analysis enabling application of the classification of the data centre;
- f) provides a reference to the operation and management of data centres.

The following topics are outside of the scope of the ISO/IEC 22237 series:

- 1) the selection of information technology and network telecommunications equipment, software and associated configuration issues are outside the scope of this International Standard;
- 2) quantitative analysis of overall service availability resulting from multi-site data centres;
- 3) safety and electromagnetic compatibility (EMC) requirements (covered by other standards and regulations. However, information given in this document can 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 TS 22237-6, *Information technology — Data centre facilities and infrastructures — Part 6: Security systems*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.