

**TECHNICAL  
SPECIFICATION**

**ISO/IEC TS  
22237-2**

First edition  
2018-05

---

---

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

**Part 2:  
Building construction**

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

*Partie 2: Construction des bâtiments*



Reference number  
ISO/IEC TS 22237-2:2018(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](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

<b>Foreword</b> .....	<b>vi</b>
<b>Introduction</b> .....	<b>vii</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms, definitions and abbreviated terms</b> .....	<b>2</b>
3.1 Terms and definitions.....	2
3.2 Abbreviated terms.....	3
<b>4 Conformance</b> .....	<b>3</b>
<b>5 Location</b> .....	<b>3</b>
5.1 Assessment of location.....	3
5.1.1 Requirements.....	3
5.1.2 Recommendations.....	4
5.2 Geographical location.....	4
5.2.1 Requirements.....	4
5.2.2 Recommendations.....	4
5.3 Natural environment.....	4
5.3.1 Requirements.....	4
5.3.2 Recommendations.....	4
5.4 Adjacencies.....	4
5.4.1 Requirements.....	4
5.4.2 Recommendations.....	5
5.5 Infrastructural factors.....	5
5.5.1 Requirements.....	5
5.5.2 Recommendations.....	5
<b>6 Site configuration</b> .....	<b>5</b>
6.1 General.....	5
6.2 Site selection.....	6
6.2.1 Requirements.....	6
6.2.2 Recommendations.....	7
6.3 Assessment of existing premises.....	7
6.3.1 Requirements.....	7
6.3.2 Recommendations.....	7
6.4 Utilities.....	7
6.4.1 Requirements.....	7
6.4.2 Recommendations.....	7
6.5 Access routes.....	7
6.5.1 Requirements.....	7
6.5.2 Recommendations.....	7
6.6 Deliveries.....	8
6.6.1 Requirements.....	8
6.6.2 Recommendations.....	8
6.7 Parking.....	8
6.7.1 Requirements.....	8
6.7.2 Recommendations.....	8
6.8 Exterior installations.....	8
6.8.1 Underground facilities.....	8
6.8.2 Telecommunications cabling.....	8
6.9 Perimeter.....	9
6.9.1 Requirements.....	9
6.9.2 Recommendations.....	9
<b>7 Building construction</b> .....	<b>9</b>
7.1 Building structure.....	9

7.1.1	General	9
7.1.2	Load-bearing structure	9
7.1.3	Building materials and finishes	9
7.2	Foundations	10
7.2.1	Requirements	10
7.2.2	Recommendations	10
7.3	Exterior walls	10
7.3.1	Requirements	10
7.3.2	Recommendations	11
7.4	Interior walls providing boundaries of Protection Class	11
7.4.1	Requirements	11
7.4.2	Recommendations	11
7.5	Roofs	11
7.5.1	General	11
7.6	Rain water drainage	12
7.6.1	Requirements	12
7.6.2	Recommendations	12
7.7	Floors and ceilings	12
7.7.1	General	12
7.7.2	Access floors	12
7.8	Corridors and doors	13
7.8.1	Requirements	13
7.8.2	Recommendations	13
<b>8</b>	<b>Data centre spaces and access routes</b>	<b>13</b>
8.1	Accommodation	13
8.1.1	General	13
8.1.2	Requirements	13
8.1.3	Recommendations	13
8.1.4	Data centre spaces	14
8.2	Protection	15
8.2.1	Requirements	15
8.2.2	Recommendations	15
8.3	Floors	15
8.3.1	General	15
8.3.2	Access floors	16
8.4	Ceilings	16
8.4.1	Requirements	16
8.4.2	Recommendations	16
8.5	Access to data centre spaces	17
8.5.1	Requirements	17
8.5.2	Recommendations	17
8.6	Vapour density	17
8.6.1	General	17
8.6.2	Requirements	17
8.6.3	Recommendations	17
<b>9</b>	<b>Fire compartments, fire barriers and fire suppression systems</b>	<b>17</b>
9.1	General	17
9.1.1	Requirements	17
9.1.2	Recommendations	18
9.2	Fire barriers	18
9.2.1	Requirements	18
9.2.2	Recommendations	18
9.3	Fire compartments for gaseous extinguishing systems	18
9.3.1	Inert gaseous extinguishing systems	18
9.3.2	Oxygen reduction systems	19
9.4	Fire suppression	19
9.4.1	Requirements	19

9.4.2	Recommendations.....	19
<b>10</b>	<b>Building configurations.....</b>	<b>19</b>
10.1	Design phase.....	19
10.1.1	Requirements.....	19
10.1.2	Recommendations.....	19
10.1.3	Areas, compartments.....	19
10.1.4	Modularity and flexibility.....	20
10.2	Inter-relationship of functional spaces.....	20
10.2.1	General.....	20
10.2.2	Space usage.....	20
10.2.3	Computer room space.....	20
10.2.4	Telecommunications space.....	21
<b>Annex A (normative) Additional requirements and recommendations.....</b>		<b>22</b>
<b>Annex B (informative) Physical protection against external hazards.....</b>		<b>23</b>
<b>Bibliography.....</b>		<b>25</b>

## 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](http://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](http://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](http://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) consultants, 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;*

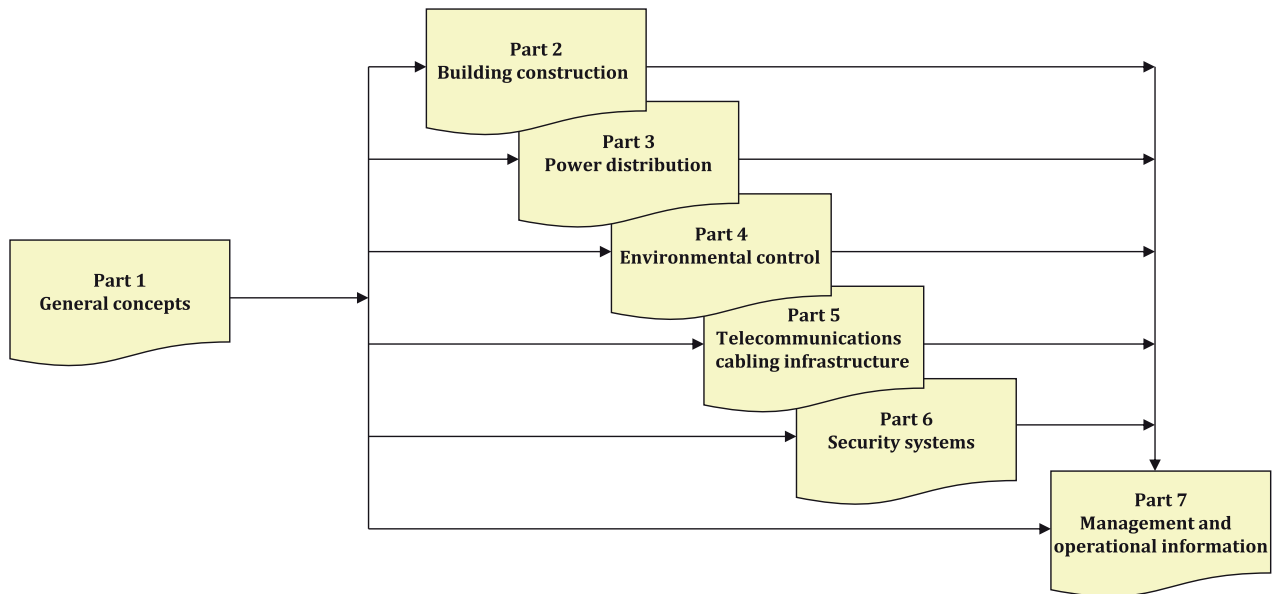
ISO/IEC TS 22237-4: *Information technology — Data centre facilities and infrastructures — Part 4: Environmental control;*

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”, “physical security” and “energy efficiency enablement” selected from ISO/IEC TS 22237-1.

This document addresses the building design of data centres; it addresses security issues from a constructional point of view, whereas ISO/IEC TS 22237-6 specifies the pertinent security system requirements of those facilities and infrastructures (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.



# Information technology — Data centre facilities and infrastructures —

## Part 2: Building construction

### 1 Scope

This document addresses the construction of buildings and other structures which provide accommodation for data centres based upon the criteria and classification for “physical security” within ISO/IEC TS 22237-1 in support of availability.

This document specifies requirements and recommendations for the following:

- a) location and site selection;
- b) building construction;
- c) building configuration;
- d) fire protection;
- e) quality construction measures.

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.

Conformance of data centres to the present document is covered in [Clause 4](#).

### 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 14520-1, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 1: General requirements*

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

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

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 22237-2:2018(E)**

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

ISO/IEC 30129, *Information technology — Telecommunications bonding networks for buildings and other structures*

IEC 62305 (all parts), *Protection against lightning*

EN 12825:2001, *Raised access floors*