



BSI Standards Publication

# Information technology — Data centre facilities and infrastructures

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Part 2-10: Earthquake risk and impact analysis

## National foreword

This Published Document is the UK implementation of CLC/TS 50600-2-10:2021.

The UK participation in its preparation was entrusted to Technical Committee TCT/7, Telecommunications - Installation requirements.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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- Part 2-10: Earthquake risk and impact analysis

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## **European foreword**

This document (CLC/TS 50600-2-10:2021) has been prepared by CLC/TC 215 “Electrotechnical aspects of telecommunication equipment”.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

This document is based on the text of ISO/IEC TR 22237-30:—1.

Regarding the structure of the EN 50600 series, see the Introduction.

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<sup>1</sup> Under preparation. Stage at time of publication: ISO/IEC DTS 22237 30:2020.

## 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 usually 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 environmental 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;
- 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 as well as the operation of the data centre. Effective management and operational information is crucial for monitoring achievement of the defined needs and objectives.

This 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, consultants, 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 EN 50600 series will comprise the following standards and documents:

EN 50600-1, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*

EN 50600-2-1, *Information technology — Data centre facilities and infrastructures — Part 2-1: Building construction*

CLC/TS 50600-2-10, *Information technology — Data centre facilities and infrastructures — Part 2-10: Earthquake risk and impact analysis*

EN 50600-2-2, *Information technology — Data centre facilities and infrastructures — Part 2-2: Power supply and distribution*

EN 50600-2-3, *Information technology — Data centre facilities and infrastructures — Part 2-3: Environmental control*

EN 50600-2-4, *Information technology — Data centre facilities and infrastructures — Part 2-4: Telecommunications cabling infrastructure*

EN 50600-2-5, *Information technology — Data centre facilities and infrastructures — Part 2-5: Security systems*

EN 50600-3-1, *Information technology — Data centre facilities and infrastructures — Part 3-1: Management and operational information*

EN 50600-4-1, *Information technology — Data centre facilities and infrastructures — Part 4-1: Overview of and general requirements for key performance indicators*

EN 50600-4-2, *Information technology — Data centre facilities and infrastructures — Part 4-2: Power Usage Effectiveness*

EN 50600-4-3, *Information technology — Data centre facilities and infrastructures — Part 4-3: Renewable Energy Factor*

EN 50600-4-6, *Information technology — Data centre facilities and infrastructures — Part 4-6: Energy Reuse Factor*

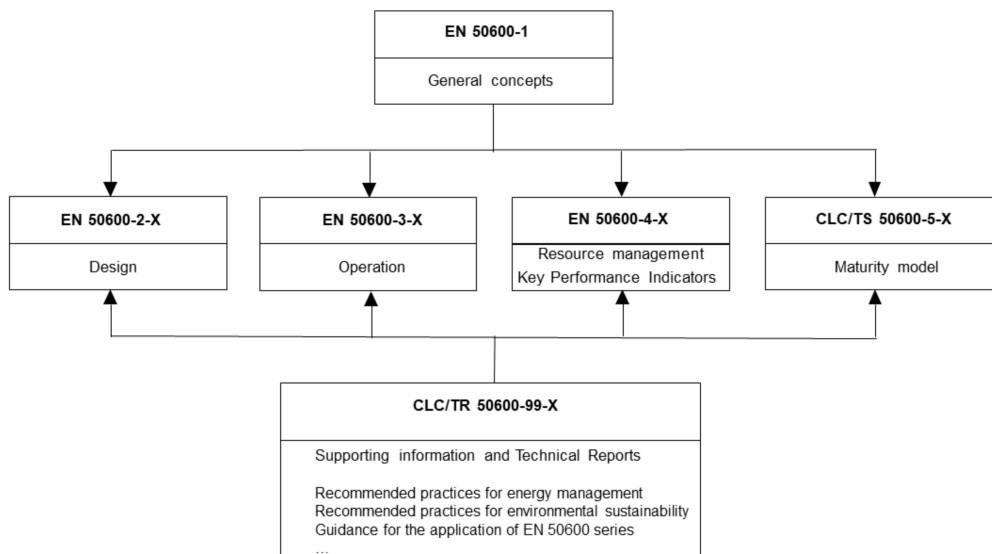
EN 50600-4-7, *Information technology — Data centre facilities and infrastructures — Part 4-7: Cooling Efficiency Ratio*

CLC/TR 50600-99-1, *Information technology — Data centre facilities and infrastructures — Part 99-1: Recommended practices for energy management*

CLC/TR 50600-99-2, *Information technology — Data centre facilities and infrastructures — Part 99-2: Recommended practices for environmental sustainability*

CLC/TR 50600-99-3, *Information technology — Data centre facilities and infrastructures — Part 99-3: Guidance to the application of EN 50600 series.*

The inter-relationship of the documents within the EN 50600 series is shown in Figure 1.



**Figure 1 — Schematic relationship between the EN 50600 series of documents**

EN 50600-2-X documents specify requirements and recommendations for particular facilities and infrastructures to support the relevant classification for “availability”, “physical security” and “energy efficiency enablement” selected from EN 50600-1.

EN 50600-3-X documents specify requirements and recommendations for data centre operations, processes and management.

EN 50600-4-X documents specify requirements and recommendations for key performance indicators (KPIs) used to assess and improve the resource usage efficiency and effectiveness, respectively, of a data centre.

CLC/TS 50600-5-X documents provide a maturity model addressing the facilities, infrastructures and the information and communication technology equipment of the data centre.

Determination of the risk and scale of seismic activity should be included as part of the overall risk assessment approach according to EN 50600-1.

In addition, EN 50600-2-1 requires a geographical risk analysis which includes seismic activity and requires mitigation actions to be undertaken as necessary but does not identify the specific actions to be applied. EN 50600-2-5 addresses external environmental events but does not explicitly list earthquakes or seismic activity within that group of events (other than general vibration) or indicate the specific measures required.

As a result, this document, CLC/TS 50600-2-10, provides requirements and recommendations for the type of risk assessment to be employed concerning seismic activity and earthquakes in relation to data centres.

## 1 Scope

This document provides requirements and recommendations for the type of risk assessment to be employed concerning seismic activity and earthquakes in relation to data centres. In addition, it describes design concepts that can be employed as mitigation actions within the construction, and other elements of design, of data centres.

## 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.

EN 50600 (series), *Information technology — Data centre facilities and infrastructures*

## 3 Terms, definitions and abbreviations

### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions in the EN 50600 series 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

##### **aseismic performance**

resistance to seismic activity of a specified scale

#### 3.1.2

##### **base isolation building**

structure that absorbs the energy of earthquakes by installing a base isolation layer composed of isolators and dampers between the ground and the building

#### 3.1.3

##### **information and communication technology equipment**

##### **ICT equipment**

information technology (IT) and network telecommunications (NT) equipment providing data storage, processing and transport services

Note 1 to entry: Representing the “critical load” of the data centre.

[SOURCE: CLC/TR 50600-99-1:2020, 3.1.16]

#### 3.1.4

##### **passive damper**

structure that absorbs the energy of earthquakes with dampers, etc., by installing energy absorption members such as dampers in main structures