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**Information and documentation —  
Document storage requirements for  
archive and library materials**

*Information et documentation — Prescriptions pour le stockage des  
documents d'archives et de bibliothèques*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 11799 was prepared by Technical Committee ISO/TC 46, *Information and documentation*.

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## Introduction

Archives and libraries are institutions established by society in order to collect, preserve and make available documents intended for consultation, by viewing directly or via a screen, or, in the case of sound recordings, by ear.

Archive and library collections normally contain material in a wide variety of formats. These are mainly paper-based books, manuscripts, files, records, maps and graphic collections, but may also include vellum, parchment, papyrus, film, photographic materials, audiovisual material, magnetic and optical media, and machine-readable formats. All these materials ideally require specific storage conditions.

Documents for current use may require different storage conditions from those requiring long-term or indefinite preservation.

This International Standard applies to the long-term storage of archive and library materials, but takes into account that, as the materials are stored to allow current use as well, some compromise with the ideal conditions for long-term storage may be unavoidable.

Depending on the climate and economic situation of a country, it may be difficult to create and maintain ideal conditions for the long-term storage of archive and library materials.

Figures and quantities given in this International Standard are intended for general international guidance. This International Standard presents some facts and general rules which should be considered when a building for the purpose of archival storage is newly constructed, when an old building originally designed for another use is converted, or when a building already in use for this purpose is renovated.

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# Information and documentation — Document storage requirements for archive and library materials

## 1 Scope

This International Standard specifies the characteristics of general-purpose repositories used for the long-term storage of archive and library materials. It covers the siting and construction of the building and the installation and equipment to be used.

It applies to all archive and library materials held in general-purpose repositories, where mixed media may be stored together. It does not preclude the establishment of separate areas or compartments within individual repositories, where the environment can be controlled to create conditions suiting the needs of specific archive materials.

It does not cover special requirements for the long-term storage of not or not fully paper-based documents such as parchment or vellum, photographic documents or machine-readable documents.

It also does not cover repository management procedures.

In a number of fields, national or local building regulations may cover in detail such matters as construction, safety and security for public buildings and buildings in which valuable objects are stored (fire precautions, emergency exits, security against earthquakes, theft, burglary, terrorist acts, etc.), as well as services and equipment in professional use. This International Standard therefore avoids detailed rules and regulations in these fields, except when recommending what may be additions to these requirements.

## 2 Normative references

The following referenced documents are indispensable for the application 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 9706:1994, *Information and documentation — Paper for documents — Requirements for permanence*

ISO 12606:1997, *Cinematography — Care and preservation of magnetic audio recordings for motion pictures and television*

ISO 18902, *Imaging materials — Processed photographic films, plates and papers — Filing enclosures and storage containers*

ISO 18911, *Imaging materials — Processed safety photographic films — Storage practices*

ISO 18918:2000, *Imaging materials — Processed photographic plates — Storage practices*

ISO 18920:2000, *Imaging materials — Processed photographic reflection prints — Storage practices*

ISO 18923:2000, *Imaging materials — Polyester base magnetic tape — Storage practices*

ISO 18925, *Imaging materials — Optical disc media — Storage practices*

### 3 Terms and definitions

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

#### 3.1

##### **archive and library materials**

all types of documents kept in archives and libraries, mainly books, manuscripts, files, records, maps, graphic collections and other documents consisting of paper, but also parchment, papyrus, films, photographic materials, audiovisual recordings, magnetic and optical media, as well as bindings and protective material

#### 3.2

##### **document**

recorded information or material object which can be treated as a unit in a documentation process

#### 3.3

##### **long-term storage**

storage, for a period of undefined length, of material kept for permanent retention

#### 3.4

##### **repository**

building or room designed or arranged and used specifically and exclusively for long-term storage of archive and library materials

### 4 Site of the building

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The site for an archive and/or library repository building should not be

- liable to subsidence or flooding,
- especially at risk from earthquakes, tidal waves or landslides,
- at risk from fire or explosions in adjacent sites,
- near a place or a building which attracts rodents, insects and other pests,
- near a plant or installation emitting harmful gases, smoke, dust, etc.,
- in an especially polluted area, nor
- near a strategic installation which could be a target in an armed conflict.

If these requirements cannot be met, special provision shall be made in the construction of the building to defend against these threats.

In order to minimize the harmful effects of exposure to sunlight, careful attention should be paid to orientation, landscaping and the site's microclimate.

### 5 Construction of the building

#### 5.1 Self-containment and security

The repository shall be secured against theft, burglary, vandalism and terrorism. Precautions should be taken against arson. The repository shall be either a purpose-built detached building or a self-contained unit within a building. There shall be only one entrance for visitors. Precautions shall be taken against any other entrances being used by unauthorized people.



NOTE 1 For more information on precautions against arson, see reference [1] in the Bibliography.

Emergency exits shall be constructed in such a way that they can easily be opened from the inside and that they cannot be opened from the outside.

NOTE 2 National regulations regarding exits may apply.

In the interests of security and climatic inertia, and also in order to protect archive and library materials from exposure to harmful light, the storage areas should have no windows. If there are windows, they shall be fitted in such a way as to exclude direct daylight (see also 6.5).

## 5.2 Climatic inertia

The repository should be designed to provide an accurate and stable internal environment, with minimum dependence on mechanical systems. This can be partially achieved by constructing the external walls, roof and floor of the building from materials that, as far as possible, insulate the interior from external climatic changes.

Walls, floors and ceilings inside the repository should be made of materials that have a high thermal capacity. In areas of the world where the relative humidity does not exceed the recommended values for prolonged periods of time, building materials with a high hygroscopic capacity are also recommended (see 6.7).

NOTE 1 For example, brick is a material with both high thermal and high hygroscopic capacity.

NOTE 2 For more information on climatic inertia, see reference [2] in the Bibliography.

## 5.3 Inner structure and load (standards.iteh.ai)

For reasons of fire safety and efficient climate control, the area used as a repository should be divided into compartments.

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NOTE 1 The maximum size of a fire compartment is normally given in national regulations.

The walls (including doors), floors and ceilings between single rooms and compartments, and between storage and other areas of the building shall be constructed so as to prevent fire (and water) from spreading into a neighbouring unit. A minimum of 2 h of fire resistance is recommended. Doors should be self-closing and should normally be kept in a closed position. Where it becomes necessary to keep doors open under normal use, they should be fitted with magnetic hold-open devices which release to permit automatic door closing upon activation of the building fire alarm/detection system. Door sills should be avoided unless absolutely essential (for example for flood prevention), in which case ramps should be provided.

The materials used for all inside surfaces shall not be combustible nor emit, attract or retain dust. Nor shall they be liable, through decomposition in the event of fire or for other reasons, to emit substances harmful to the materials stored, e.g. acidic gases. The choice of material shall minimize, in the case of fire, the emission of harmful substances, smoke and soot.

NOTE 2 Methods to test the surface-burning characteristics of building materials (flame spread and smoke generation) are given in references [3] and [4] in the Bibliography.

When constructing the floors, it shall be taken into account that densely stored archive and library materials can have a considerable weight. A structural engineer should calculate and recommend floor-loading requirements based on the density and quantity of the materials stored.

## 6 Installation and equipment

Use the following International Standards whenever possible: ISO 12606, ISO 18911, ISO 18918, ISO 18920, ISO 18923, ISO 18925.

## 6.1 Services

Supply systems for electricity, gas, and especially for water, shall not be located in or near a room in the repository, unless needed in that room for a specific function directly connected with the collections.

Installations providing temperature/humidity control, air filtration and ventilation systems shall be connected to a central plant room. This room shall not be in the same fire compartment as the storage area, and should preferably be in a separate building.

## 6.2 Fire detection system

All parts of the building shall be provided with a fire detection system connected to a central monitoring panel. Such a system shall respond automatically to the presence of fire by detecting smoke or other products of combustion. Heat detection devices shall only be installed as the sole method of detection in areas such as plant rooms where other types of detectors may be inappropriate or unsuitable. All parts of the building shall, in addition, be provided with manually operated fire-alarm call points which can be used by occupants to indicate the presence of a fire.

The operation of the detection system shall result in the following actions:

- a local warning at the control panel and/or repeater panels, indicating where a fire has been detected;
- operation of plant shut-down, such as air conditioning or heating systems;
- automatic transmission of a warning to the local fire brigade or central alarm station;
- general fire-alarm warning throughout the repository building.

The central fire-alarm control panel should provide a facility to monitor all components of the system and should visually display the status of the system. Panels should be located in a convenient, central location which is continuously manned or is manned while the repository is occupied or open. Where the panel is not located at or near the probable fire-brigade entry point, a supplementary or repeater panel should be provided for the use of the fire brigade.

NOTE National or local fire-alarm codes may apply.

## 6.3 Fire extinguishing system

Consideration should be given to the benefits offered by an automatic fire fighting system. Gas- or water-based fire fighting systems are accepted in repositories.

Where automatic fire extinguishing systems are used, they shall be regularly inspected and maintained. They shall be designed to minimize damage to archive and library materials from fire and fire-suppression action.

NOTE 1 Properly designed, installed and maintained sprinkler systems do far less damage than manually fighting a fire that has not been contained by a sprinkler system. Possible malfunction of a sprinkler system, however, may cause severe damage to documents.

NOTE 2 Water-mist systems currently being researched for library and archive use apply small amounts of water at very high pressure and may offer a substantial advantage over conventional sprinkler systems. A principal advantage of water mist is that, when correctly designed and installed, all the water discharged should turn to vapour and leave virtually no residual water. Research is still in progress to determine whether water-mist systems are effective in high-density storage systems utilizing compact shelving or in repositories employing very high shelving.

Where water-based fire protection systems are to be installed, provision shall be made for rapid drainage from all protected spaces. Shafts, staircases and drains should be so configured that water leaving one space does not enter another. Intermediate floors in multi-storey repositories should be waterproofed.

Gas systems shall only be used for small compartments, i.e. discrete spaces which can be made airtight. Halon gases are excluded for environmental reasons. Carbon dioxide should not be used for rooms normally occupied by people.

NOTE 3 New fire-extinguishing gases without the same environmental impact as the original halon gases have been and are being developed.

Where an automatic fire extinguishing system is not to be provided, the following shall be installed:

- hose reels or racks in such a position that all parts of the building are within 6 m of the nozzle of a fully extended hose;
- hydrant systems or rising mains on all buildings more than 30 m in height or where a single floor exceeds 1 000 m<sup>2</sup>. The hydrant or rising mains should be located so as to permit the fire brigade to pressurize the pipework from outside the building.

These installations are also recommended as backup systems to an automatic fire extinguishing system.

A smoke extraction system is recommended.

Portable fire extinguishers shall always be available, even if an automatic fire suppression system has been installed. Hand-held extinguishers shall be strategically placed. Staff should be trained in the proper use of fire extinguishers. If they are expected to use fire hoses, they should also be trained in their proper use.

Gas and water are suitable. Water extinguishers should never be used on fires in electrical equipment.

#### 6.4 Intruder alarm

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A monitored intruder-alarm system should be provided.

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#### 6.5 Illumination

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The damage caused by light is cumulative. Intensity, duration and spectral distribution of any illumination in a repository should be controlled to minimize damage.

A repository room shall not be illuminated more than is necessary for retrieval and replacement of documents, room inspection and cleaning. For the two latter purposes, an illumination of about 200 lx on the floor level is suggested. Direct daylight should be excluded. In a building not primarily designed as a repository, but adapted for that purpose, windows shall ideally be blocked up, or as a minimum be screened by curtains or blinds, and/or by UV filtering on the window glass.

Similar screening provisions are recommended for offices, public reading rooms and any other room in which documents are consulted.

Illumination shall be provided by one of the following:

- fluorescent lamps fitted with diffusers. If the emitted radiation contains a relative ultraviolet component of more than 75 µW/lm, each lamp shall be fitted with an ultraviolet filter that diminishes the relative ultraviolet radiation (with a wavelength below 400 nm) to below that level;
- incandescent light fitted with heat-absorbing filters. The minimum distance between the lamp and an item on a shelf shall be 500 mm;
- fibre-optic lighting systems, with the light-generating unit placed well away from the object to be illuminated.