
**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.

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

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

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

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 m². 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

A monitored intruder-alarm system should be provided.

6.5 Illumination

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.

NOTE 1 The ratio between radiant flux with a wavelength shorter than 400 nm (i.e. ultraviolet radiation), and the total luminous flux, is measured in microwatts per lumen ($\mu\text{W}/\text{lm}$). With a view to preservation of documents, the accepted maximum limit for ultraviolet radiation is 75 $\mu\text{W}/\text{lm}$.

NOTE 2 Fluorescent lamps fitted with diffusers or fibre-optic lighting are preferred. At present, fibre-optic lighting is only feasible for exhibition purposes.

There shall be separate switches for the illumination of each of the sections that the repository is naturally divided into.

At an easily accessible place outside the repository, there should be a central switch indicating whether all lights and other electrical circuits in the repository are turned off.

6.6 Ventilation and air quality

The repository shall be ventilated in such a way as to allow free circulation of air throughout, and to prevent a build-up of pockets of high relative humidity.

If this does not occur naturally, a ventilation system should be provided. There should be fresh air intake, the amount depending on local circumstances.

Specific attention should be given to ventilation around and within the shelving. To ensure this there shall be a distance of at least 150 mm between the floor and the lowest shelf, as well as between the average line of upper edges of objects stored on the top shelf and the ceiling. There shall also be a distance of at least 50 mm between the top of the highest document on each shelf and the bottom of the shelf above. Gangways and aisles also allow ventilation (see also 6.8).

The air in a repository should be kept free of air pollution, acidic and oxidizing gases and dust. Suggested maximum levels of the most common air pollutants are listed in informative Annex A. It shall be taken into account that some materials such as plastics for wrapping, paints and coatings for walls and shelves, etc. may emit noxious gases not only when burning (see 5.3. and 6.8.), but also by degassing and decomposing. When choosing materials for building, furniture and equipment, the amount of off-gassing should be taken into account. A certain time lapse (up to a couple of weeks, when the off-gassing of new materials is the highest) before putting new buildings, furniture and equipment into use is also advisable.

NOTE Photographic, audiovisual and magnetic media are particularly sensitive to oxidizing pollutants, dusty air and/or other active compounds. Optical disks are also sensitive to oxidizing agents. Separate storage for these materials is usually necessary because of their lower temperature and humidity requirements, and because of the degradation products they give off.

The air quality inside the repository should be monitored regularly for acidic and oxidizing gases and dust. The frequency should be such that seasonal or other repeated variations are discovered. This will make any irregular variation stand out more clearly.

If a filter system is used, materials used for filtration shall in themselves not be damaging to the documents. Filter systems shall be regularly maintained.

6.7 Room climate

Repositories for archive and library materials should be kept at a cool temperature, ideally controlled in a building constructed according to the principles of climatic inertia (see 5.2).

Repositories for archive and library materials shall be kept at a relative humidity below the point where microbiological activity occurs.

NOTE According to the present state of knowledge, there is an increasing risk of microbiological activity above 60 % relative humidity, and increased brittleness at a very low relative humidity. The lowest acceptable humidity for long-term storage of archive and library materials is under discussion. For different kinds of materials, different limits are recommended, but there is no general agreement, either upon temperature or upon humidity. It has been established that

materials last longer at lower temperatures and at lower relative humidity. As a guidance, the data in informative Annex B may be used.

Sharp fluctuations in temperature and relative humidity put stress on archive and library materials and should therefore be avoided. The aim shall be to achieve as stable a temperature and relative humidity as is practicable.

There shall be monitoring devices for temperature and humidity, preferably recording instruments that register conditions at different times and in different seasons. Sensors should be sited to provide readings that represent the storage areas, but account should also be taken of any extreme or abnormal conditions which may be present, e.g. near outside walls or close to a source of heating or ventilation.

The monitoring instruments shall be calibrated and recalibrated according to the manufacturer's instruction.

When material is taken out of cold storage, it shall be acclimatized. In order to avoid expansion and contraction, measures shall be taken to ensure that the material absorbs or gives off as little moisture as needed to equilibrate with its new climatic conditions. Special attention shall be paid to the danger of approaching the dew point at the surface of an item, if it is moved to a warmer room or inside an airtight container (glass, plastics) when such items are relocated from cold storage.

When moving an item from a cool to a warm room, satisfactory acclimatization can be achieved by placing it in an airtight enclosure with a minimum air volume until the temperature has risen to the ambient temperature. When moving an item in an airtight enclosure back to cold storage, the enclosure should not be removed for a while, until the item has acclimatized.

6.8 Furniture and equipment

No furniture or equipment other than that used for storage and handling of documents shall be in a repository. Furniture or equipment used shall have no sharp edges or corners, nor protrusions on the sides adjacent to the stored items and shall not damage documents upon contact.

The materials used for furniture or equipment 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, e.g. natural ageing, 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.

For the correct functioning of the principles of climatic inertia (see 5.2.), no furniture nor any other item shall be placed in close proximity to an outside wall. There should be a distance of at least 200 mm between items and wall.

The load-bearing capacity of shelving shall be sufficient to carry their load (see 5.3). The shelves should be large enough to ensure that documents will not protrude beyond the edges.

Shelves for normal storage, e.g. of books, shall be fitted in such a way that the material will stand upright when required. The items shall be able to be stored close together, but not so close that items cannot be easily removed. Equipment for this purpose shall be easily adjustable. For books and paper documents, the lateral or vertical pressure on an individual item should not exceed 350 Pa for normal objects and 150 Pa for electrostatic copies.

NOTE A pressure of 350 Pa roughly corresponds to that received by a book lying horizontally, on which a book of similar size and 45 mm thick has been placed.

In order to allow easy access for normal and emergency use, and to allow air circulation, ample space should be left between the shelves (or blocks of shelving) and between shelves (or blocks of shelving) and walls (see also 6.6). If, for reasons of security, the shelves are subject to limited access, this should be effected by materials allowing air circulation, such as a grill or a punched plate. In order to protect the materials, facilitate use, and minimize danger in emergency situations, the height of the shelving should never exceed 215 cm.

7 Use

7.1 General

In a repository for archive and library materials, smoking, eating and drinking shall be strictly forbidden. Activities not related to storage shall not take place. Only archive and library materials shall be stored there (with the exception of disaster recovery equipment and materials).

For security reasons, telephone extensions or other communication systems should be present in each compartment of the repository.

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

7.2 Cleaning and disinfection

The repository, its air-handling systems and the items stored shall be cleaned regularly. Cleaning agents shall not be harmful to the materials stored.

The items in the repository shall be free from biological infestation. Documents received for the first time from outside shall be examined before being placed in the repository. Any item suspected of being infested should receive disinfective treatment, as well as the stack area and shelving in the place where the infestation has been detected. Cleaning shall be carried out using vacuum cleaners fitted with filters retaining fungal spores.

All methods of disinfection using chemicals or radiation are likely to be damaging to the materials. Deep freezing should be considered as a treatment for insect infestation.

An isolation room shall be used for inspection, cleaning and interim storage of documents which may be infected.

7.3 Protection

All documents shall be protected. The degree of protection required depends on the state of the documents and the amount of use they are likely to receive.

Bindings and custom-built boxes, as well as document boxes, folders or containers provide effective means of protecting the documents. Any protective covering should enclose and support the items without exerting undue pressure.

The protective device shall not carry original information which is not also in the document.

Paper for protective material in direct contact with documents shall fulfil the conditions of ISO 9706. Protective material shall not contain plasticizer nor emit acidic or otherwise noxious gases.

For storage of photographic materials, which are not within the scope of this International Standard, ISO 18902 applies. ISO 18902 may also be valid for other dyestuff-based copies (e.g. blueprints).

No uncoated metal surface shall be in direct contact with stored items. The coating shall not be combustible nor emit, attract or retain dust. Nor shall it be liable, through decomposition in the event of fire or for other reasons, to emit substances harmful to the documents stored, e.g. acidic gases. The choice of material shall minimize, in the case of fire, the emission of harmful substances, smoke and soot.

7.4 Storage position

Books shall be stored upright on the tail edge. Volumes with a height over 400 mm should be stored flat. If they are placed on top of one another, their weight shall be taken into account. There shall be no excessive pressure on the volume at the bottom (see Note to 6.8) and it shall be possible to remove and replace it easily.

NOTE Easy handling will hardly be possible if more than three items are placed on top of one another, and if the height of such a stack exceeds 150 mm.

Single sheets (maps, posters, graphic art, drawings), shall always be well protected. Large formats should be stored flat in protective enclosures such as boxes, drawers or custom housing. Single-sheet items that are large or vulnerable should be placed in individual folders or mats within the enclosures. Outsized items, too large to be accommodated in such an enclosure, may be rolled if the document material is sufficiently robust to withstand rolling.

8 Disaster-control plan

For a proper system of indefinite storage, a risk-assessment and disaster-preparedness plan pertinent to the specific building and collections shall be established, and all staff should be familiar with it. For elements of such a plan, see informative Annex C and items [7] to [10] in the Bibliography.

9 Exhibitions

Generally, for exhibitions the same requirements regarding room climate, security, etc. as for document repositories apply. Exhibitions put documents at increased risk, and shall therefore be restricted to a minimum. Items should not be permanently on exhibition.

Being on exhibition means that the surface of a document is exposed to extensive periods of light. Furthermore, the damage done by light to a document is cumulative. Consequently, both the intensity and the duration of light exposure on a document on exhibition shall be reduced to a minimum. This is especially necessary for the most sensitive items such as modern writing inks, acidic groundwood paper, colour photographs, coloured prints and drawings, etc. A light level of 50 lx on the displayed document is sufficient for viewing, if ambient light levels are lower and sufficient time is allowed for the viewer's eyes to adjust to the lower light level. No incandescent light, nor any other heat-generating light source, shall be placed inside or close to a showcase.

NOTE Curtains on the showcases, which are opened only when a visitor is inspecting the items, may reduce the time of exposure to light. Light switches outside a showcase or an exhibition cabinet, which can be turned on by the viewer and are turned off automatically after a suitable time, fulfil the same purpose.

For documents required repeatedly for exhibition, a facsimile substitute should be provided.

Annex A

(informative)

Maximum limits tolerance for air pollutants

Table A.1

Type of pollutants	Maximum limits tolerance	
	volume fraction $\times 10^9$	$\mu\text{g}/\text{m}^3$
Sulfur dioxide (SO_2)	5 to 10	—
Nitrogen oxides (NO_x)	5 to 10	—
Ozone (O_3)	5 to 10	—
Acetic acid (CH_3COOH)	< 4	—
Formaldehyde (HCHO)	< 4	—
Dust particles, including mould spores	—	50
NOTE 1 The limit for dust particles presupposes a removal by the air filtration system of 60 % to 80 % of the dust particles with a diameter of more than 0,5 μ .		
NOTE 2 The first three figures are taken from reference [5] in the Bibliography, where a discussion of the practicality, given the current air-filtration technology, is included.		
NOTE 3 The levels for acetic acid and formaldehyde are based on experience from the US National Archives.		
NOTE 4 Volume fraction 10^{-9} is equal to a part per billion by volume.		

Annex B (informative)

Recommended climatic conditions for the long-term storage of archive and library materials

Very generally speaking, lowering the temperature and/or lowering the relative humidity will lengthen the life of the documents. However, other effects may run counter to this, notably condensation if the temperature sinks below the dew point, and substrate brittleness when the relative humidity becomes low. The figures in Table B.1 are compiled from different sources, mainly from other standards, see Clause 2 and items [5] and [6] in the Bibliography. It is strongly recommended that these publications be consulted for more details about areas of application, alternative storage conditions for different purposes, etc. To enhance the usefulness of this annex, data on materials outside the scope of this International Standard are included. For documents made of paper, parchment and leather, and for diverse varieties of gramophone discs and some magnetic media, no International Standards on document storage exist. The figures in Table B.1 for such material types are taken from other referenced documents, and it may be possible to find alternative climatic conditions recommended in other publications. In any case, and for all types of materials, the archive or library should choose its climatic level, also taking into account the nature and value of the documents as the financial costs of keeping temperature and humidity levels low.

Requirements relating to climatic conditions for materials that are to be heavily and often used, and which therefore cannot be subject to an acclimatization process, will differ from the figures in Table B.1. Maximum document longevity and maximum readiness for use are two different options, that in many cases are mutually exclusive. In Table B.1, an exception from the long-life option is made for paper documents in regular use, for which such climatic data are given that will promote paper suppleness more than paper longevity. Paper suppleness, due to a higher water content adsorbed on the paper fibres, will minimize mechanical damage to the paper caused by handling, but it will make chemical deterioration proceed faster.

**Table B.1 — Recommended climatic conditions for the long-term storage of archive
and library materials**

Type of materials	Temperature °C			Relative humidity %		
	min.	max.	Tolerable daily changes within the limits	min.	max.	Tolerable daily changes within the limits
Paper, optimum preservation	2	18	± 1	30	45	± 3
Paper, staffed stack areas, items in regular use	14	18	± 1	35	50	± 3
Parchment, leather	2	18	± 1	50	60	± 3
Photographic film: black and white silver gelatin on cellulose acetate base:						
EITHER		2	± 2	20	50	± 5
OR		5	± 2	20	40	± 5
OR		7	± 2	20	30	± 5
Photographic film: black and white silver gelatin or silver dye bleach on polyester base		21	± 2	20	50	± 5