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**Information and documentation — Boxes,  
file covers and other enclosures, made  
from cellulosic materials, for storage of  
paper and parchment documents**

*Information et documentation — Boîtes, chemises et autres contenants  
en matériaux cellulosiques, pour le stockage des documents sur papier  
et parchemin*

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## Foreword

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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 16245 was prepared by Technical Committee ISO/TC 46, *Information and documentation*.

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## Introduction

Boxes and file covers are available in several different materials. Those made of cellulosic materials are the most commonly used enclosures for long term storage of paper and parchment documents. Experience has shown that properties of the enclosure are of great importance to the protection, permanence and durability of the documents. This International Standard specifies a number of basic requirements relevant to the material composition and construction of cellulose based boxes and file covers.

The purpose of boxes and file covers is to hold and contain documents in prescribed order or grouping, to provide a protective container, and to facilitate identification, transport and storage. Preferably, the same file covers and boxes can be used from storage at the place of work to the final archive storage. Moreover, it is possible to transport, handle and lend the volume as a unit.

Boxes, through their design and construction, protect documents from environmental risks such as light, rapid temperature and moisture changes and dust, as well as from damage related to handling. File covers further protect documents by enclosing them with materials specified for their preservation qualities. However, even high quality file covers and boxes can not compensate for poor storage conditions.

This International Standard can be used as a specification. It can also be incorporated as an element into other specifications, used in trade, or in other national or International Standards for more specialized purposes.

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# Information and documentation — Boxes, file covers and other enclosures, made from cellulosic materials, for storage of paper and parchment documents

## 1 Scope

This International Standard specifies requirements for boxes and file covers, made of cellulosic material, to be used for long term storage of documents on paper or parchment.

This International Standard is applicable to boxes made of solid or corrugated board and to file covers made of paper or board.

This International Standard can also be applicable to other types of enclosure for long term storage such as cases, portfolios, tubes and envelopes made of cellulosic material.

This International Standard is not applicable to storage of photographic materials.

NOTE ISO 18902 contains requirements on storage materials for photographs.

## 2 Normative references

ISO 16245:2009

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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 references document (including any amendments) applies.

ISO 5-3, *Photography and graphic technology — Density measurements — Part 3: Spectral conditions*

ISO 5-4, *Photography and graphic technology — Density measurements — Part 4: Geometric conditions for reflection density*

ISO 535, *Paper and board — Determination of water absorptiveness — Cobb method*

ISO 536, *Paper and board — Determination of grammage*

ISO 4046-3:2002, *Paper, board, pulps and related terms — Vocabulary — Part 3: Paper-making terminology*

ISO 5626:1993, *Paper — Determination of folding endurance*

ISO 9706:1994, *Information and documentation — Paper for documents — Requirements for permanence*

ISO 12048:1994, *Packaging — Complete, filled transport packages — Compression and stacking tests using a compression tester*

### 3 Terms, definitions and symbols

#### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4046-3 pertaining to paper-making properties and the following apply.

##### 3.1.1

###### **box**

storage container intended to protect documents and facilitate their shelving and handling

##### 3.1.2

###### **file cover**

folded sheet of paper or board used for housing of and as a separating agent for document(s)

#### 3.2 Symbols

$Cobb_{60}$	The calculated mass of water absorbed in 60 s by 1 m <sup>2</sup> of paper or board under specified conditions
$D_R$	Reflection density
$S_A$	Spectral power of the influx spectrum, reflection
$s_V$	Visual spectral responsivity
$V$	Spectral luminous efficiency
$p_{max}$	Maximum pressure

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### 4 Requirements for boxes

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#### 4.1 General

Materials used shall not contain or form any substances, or have physical characteristics, which may be harmful to the documents being stored.

#### 4.2 Board

Two types of board for boxes are specified:

- type A;
- type B.

Type A board shall meet the requirements specified in ISO 9706:1994, 5.3 (for alkali reserve), 5.4 (for the Kappa number), 5.5 (for the pH value), and shall be neutral sized or alkaline sized. All layers of board shall meet these requirements. Layers of corrugated board shall be measured individually. Solid board need not be separated. The test values of unseparated solid board, together with the manufacturer's warrant of the use of an alkaline process and the use of rag or bleached chemical pulp for all layers are acceptable.

Type B board shall meet the requirements specified in ISO 9706:1994, 5.3 (for the alkali reserve), 5.5 (for the pH value), and shall be neutral sized or alkaline sized. Type B board has no restriction in Kappa number and no limit in lignin content. All layers of board shall meet these requirements. Layers of corrugated board shall be measured individually. Solid board need not be separated. The test values of unseparated solid board, together with the manufacturer's warrant of the use of an alkaline process for all layers are accepted.

If a board used for boxes consists of two or more layers of different types, where at least one layer does not meet the requirements for type A board, the board shall be classified as type B.

Boxes made of type A board may be used without file covers. Boxes made of type B board are intended to be used together with file covers as specified in Clause 5.

The box shall be marked on the exterior, either:

- a) "Board ISO 16245-A" for boxes made of type A board, or
- b) "Board ISO 16245-B" for boxes made of type B board.

### 4.3 Cloth covering

A box may be covered with cloth. The cloth used, including pre-printed, shall be coated or impregnated with a non-migratory resinous substance, e.g. acrylic resin. The cloth shall be highly resistant to folding, tearing and rubbing. They shall be light resistant and suitable for direct lettering. The surface shall be non-friable with the surface fibres fully coated.

### 4.4 Lining

A box may be lined with paper. The paper used shall meet the requirements in 5.2, except for the grammage.

### 4.5 Colour

The board and lining should preferably not contain optical brightening agents, dyes or pigments.

However, if such board or lining is used, there shall be no bleeding of optical brightening agents, dyes or pigments when tested in accordance with the method specified in 5.8.

The covering may be coloured but shall then meet the requirements of 5.8.

### 4.6 Surface

The Cobb<sub>60</sub> value shall be determined in accordance with ISO 535. The Cobb<sub>60</sub> value for the exterior of uncovered boxes shall not be higher than 25.

The surface shall be capable of being marked.

### 4.7 Adhesives

Adhesives used for production of board or boxes shall not contain external plasticizers. The manufacturer shall specify the type of adhesive used and shall confirm the absence of plasticizer.

NOTE Experience has shown that starch or co-polymer of ethene and vinyl acetate (EVA) without external plasticizers is acceptable. An alkaline buffering agent, e.g. calcium carbonate, can be added to an EVA adhesive to neutralize adverse effects of possible acetic acid emission following application.

### 4.8 Manufacturer's joints and fasteners

Use of manufacturer's joints for box assembly such as rivets, wire stitches or staples should be avoided. However, if metal manufacturer's joints are required, they shall be of a non-corrosive material, e.g. stainless steel.

If fasteners are used, they shall be of a non-corrosive material, e.g. stainless steel.

## 4.9 Design

The box shall be designed so that it encloses file covers and documents and provides for their easy access and removal. The box shall not be air-tight.

No damage to the documents shall be caused by rivets, staples, etc., used in the construction of the box. If the box is provided with a facility for pulling the box out from the shelf, the construction shall not be such that the documents can be damaged. The box opening shall be designed so as to avoid any damage to the documents when they are taken from the box.

The box shall withstand repeated opening and closing at least 300 times. The design should enable both vertical and horizontal storage, the vertical storage with the short or long side down. If the box is optimized for use in one position, this shall be indicated on the exterior of the box.

## 4.10 Strength

The box shall resist a pressure of at least 20 kPa.

Test the strength of the box as follows. Use five empty boxes and test each box separately. If they are assembled by the manufacturer, test them as delivered. If they are not assembled, assemble them according to the manufacturer's instruction. Use a compression tester in accordance with ISO 12048:1994, Clause 4. Condition the boxes at  $(23 \pm 2)$  °C,  $(50 \pm 5)$  % RH and carry out the test in the same atmospheric conditions. Position the box in the orientation(s) for which it is designed to be used or transported. Apply the load by movement of the platens at a relative speed of  $(10 \pm 3)$  mm/min until compression test failure occurs. Record and determine the maximum pressure  $p_{\max}$ . The mean value of the maximum pressure from the five tests shall not be less than 20 kPa.

NOTE For an area of 320 mm × 245 mm, the pressure of 20 kPa corresponds to a load of approximately 160 kg of mass.

## 4.11 Dimensions

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The internal dimensions of boxes shall be larger than the dimensions of the file covers and documents they contain and shall permit easy retrieval.

NOTE Dimensions of boxes, including tolerances, are typically provided by the user at the time of procurement.

## 5 Requirements for file covers

### 5.1 General

Materials used shall not contain or form any substances, or have physical characteristics, which may be harmful to the documents being stored.

### 5.2 Paper and board

Paper and board shall be neutral sized or alkaline sized and meet the requirements in ISO 9706:1994, 5.3, 5.4 and 5.5.

The grammage of the paper and board shall be determined in accordance with ISO 536. The grammage shall be at least 100 g/m<sup>2</sup>.

The paper and board shall not contain optical brightening agents.

Archival paper, as defined and specified in ISO 11108, also meets the requirements in ISO 9706, but is generally superior in durability.



### 5.3 Colour

The paper and board should preferably not contain dyes or pigments. However, if coloured paper or board is used, there shall be no bleeding of dyes or pigments when tested in accordance with the method described in 5.8.

Coloured file covers shall have a tone and colour intensity such that they provide for easy reading by eye, copying, microfilming or scanning. The optical density of the file cover (ISO 5 visual density),  $D_R(S_A:s_V)$ , shall not be higher than 0,20 when determined as specified in ISO 5-3 and ISO 5-4.

NOTE The rendering of the information when copying, microfilming or scanning is dependent both on the density of the file cover and the density of the image.

### 5.4 Adhesives

Adhesives should be avoided. However, if adhesives are required, they shall not contain external plasticizers. The manufacturer shall specify the type of adhesive used and shall confirm the absence of plasticizer.

NOTE Experience has shown that starch or co-polymer of ethene and vinyl acetate (EVA) without external plasticizers is acceptable. An alkaline buffering agent, e.g. calcium carbonate, may be added to an EVA adhesive to neutralize adverse effects of possible acetic acid emission following application.

### 5.5 Fasteners

Use of fasteners such as rivets, wire stitches or staples should be avoided. However, if metal fasteners are required, they shall be of a non-corrosive material, e.g. stainless steel.

### 5.6 Strength

The folding endurance of the paper shall be determined in accordance with ISO 5626. Paper with thickness up to 0,25 mm shall have a folding endurance in any direction (machine and cross) of at least 1,9 when determined with the instrument specified in ISO 5626:1993, A.1, or of at least 1,7 when determined with one of the instruments specified in ISO 5626:1993, A.2, A.3 or A.4.

Paper and board with thickness over 0,25 mm shall be scored, e.g. a straight channel pressed into the surface of paper so as to make folding of the paper possible or easier.

### 5.7 Dimensions

The dimensions of file covers shall be larger than the dimensions of the documents they contain and shall be compatible with the dimensions of boxes.

NOTE Dimensions of file covers, including tolerances, are typically provided by the user at the time of procurement.

### 5.8 Bleeding

Testing of materials containing optical brightening agents, dyes or pigments shall be performed as follows.

Soak two pieces of filter paper Whatman No. 1 of size approximately 80 mm × 80 mm in deionized water at 20 °C to 25 °C. Place one of the pieces on a flat plate of e.g. aluminium or inert glass. Cut a piece of size 40 mm × 40 mm of the material to be tested and put it on the filter paper. Cover with the other filter paper and put a flat plate of aluminium or inert glass on the top. Load with 12 kPa (this approximately corresponds to a weight of mass of 2 kg). Remove the load and the sample after 20 min and allow the two filter papers to dry in a hanging position.

Inspect the filter papers visually under daylight conditions. No transfer of colour to the filter paper is acceptable.

Inspect the filter papers and an unexposed piece of filter paper simultaneously under a UV lamp. No fluorescence from the exposed filter paper is acceptable.