INTERNATIONAL STANDARD

**ISO 11800**

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# Information and documentation — Requirements for binding materials and methods used in the manufacture of books

*Information et documentation — Prescriptions pour les matériaux et méthodes de reliure utilisés dans la fabrication des livres*

Reference number
ISO 11800:1998(E)

# Contents





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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.

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.

International Standard ISO 11800 was prepared by Technical Committee ISO/TC 46, *Information and documentation,* Subcommittee SC 10, *Physical keeping of documents.*

Annexes A and B form an integral part of this International Standard. Annexes C and D are for information only.

# Introduction

The usability and durability of books held in libraries and archives is a matter of natural concern to the public. Private book buyers and readers have a similar interest in such lasting qualities of the books they purchase. Books, in principle, should remain in good physical condition for as long as their contents are worth preserving. They should be manufactured to meet the requirements of their intended use.

Industrialized manufacturing methods, unfortunately, have not improved the quality of the average book. An increasing percentage of recently produced books tend to fall apart prematurely. Tests in library laboratories and simple observation show that some of the core problems lie in the binding materials and binding methods. Libraries and archives around the world are concerned about the consequences. It is envisaged that, more and more, recently acquired books will either fall apart before they are withdrawn from the collection for textual reasons, or they will have to be replaced or rebound. In either case, library and archival systems worldwide are likely to face enormous expenses in the future if the quality of the average book is not improved. This, for many public, academic and special libraries, could be an incentive to become more selective in their acquisitions and to buy fewer new titles.

This International Standard addresses publishers and book manufacturers. It also addresses acquisition librarians and archivists with a view to informing library and archival staff about the good physical properties they should expect in the books they acquire for public use. The purpose of this International Standard is to provide a means of specifying manufacturing methods and binding materials to be used for the production and making of quality books.

Good quality book bindings should be capable of withstanding ordinary use for a satisfactory period of time without significant breakdown of the binding structure. The properties of a durable book explicitly include the permanency of all the component parts, including its paper, the secure attachment of its leaves together, preferably by sewing, to form the book block, the secure attachment of the book block to its protective cover, and the resistance of the cover to the effects of abrasion, soiling and exposure to light. The concept of durability includes the attribute of flexibility, i.e. the ability of a book to open well without stress under normal reading conditions.

For heavy wear, long-term keeping and eventually rebinding of the book block, adhesive binding is not considered by this International Standard to be as recommendable as sewn binding. For that reason, adhesive binding is not an integral part of this International Standard. Yet adhesive-bound books can be manufactured to meet such simple requirements as the secure attachment of their leaves together to form the book block, the secure attachment of the book block to its protective cover and some resistance of both paper and cover materials to the effects of wear and deterioration. Guidelines for the manufacture of well-produced adhesive-bound books, therefore, are included as an annex to this International Standard. The requirements for adhesive binding include the minimum requirements for acceptable bookbinding under circumstances mentioned in the scope of this International Standard, described in clause C.1 of annex C, and further explained in annex D. For the sake of expediency, the numbering scheme applied in annexes A and B of this International Standard is repeated in the Guidelines for adhesive-bound books in annex C.

Of concern regarding both sewn and adhesive binding are those methods and materials that affect the ease with which a volume can be rebound or repaired. With this in view, and to ensure that books will open easily when in use, this International Standard also includes minimum requirements for the size of the inner margins which must be respected during the imposition of the text matter.

# Information and documentation — Requirements for binding materials and methods used in the manufacture of books

## 1 Scope

This International Standard specifies manufacturing methods and materials that will result in durable hard cover and soft cover binding for books manufactured in commercial quantities. It does not apply to hand bookbinding, individual casing or binding of archival matter. Nor does it apply to fine binding which does not serve its normal purpose of primarily protecting a book block (such as sculptural art formed around book-like material).

This International Standard has two normative annexes and one annex with a set of guidelines, each specifying the requirements for its special category of binding.

Category A binding (annex A) is intended

— for books of permanent retention;

— for books produced with a view to heavy use over prolonged periods, e.g. reference works;

— for valuable volumes requiring lasting protection;

— for items having lasting aesthetic value.

Category B binding (annex B) is intended

— for books and periodicals in soft cover and of permanent retention;

— for books and periodicals produced with a view to heavy use over prolonged periods;

— for valuable volumes requiring lasting protection;

— for items having aesthetic value.

Guidelines that specify recommended manufacturing methods and materials for soft cover and hard cover adhesive-bound books are given in annex C. Annex D contains information regarding the fields of application suggested for category A and B bindings and for adhesive-bound books.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 302:1981, *Pulps — Determination of Kappa number.*

ISO 534:1988, *Paper and board — Determination of thickness and apparent bulk density or apparent sheet density.*

ISO 536:1995, *Paper and board — Determination of grammage.*

ISO 2758:1983, *Paper — Determination of bursting strength.*

ISO 2835:1974, *Prints and printing inks — Assessment of light fastness.*

ISO 4046:1978, *Paper, board, pulp and related terms — Vocabulary.*

ISO 5081:1977, *Textiles — Woven fabrics — Determination of breaking strength and elongation (Strip method)*[1].

ISO 5127-2:1983, *Documentation and information — Vocabulary — Part 2: Traditional documents.*

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

ISO 6588:1981, *Paper, board and pulps — Determination of pH of aqueous extracts.*

ISO 9665:1993, *Adhesives — Animal glues — Methods for sampling and testing.*

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

ANSI L29.1-1977 (R1984), *Fabrics for Book Covers*[2].

## 3 Definitions

For the purposes of this International Standard, the following definitions apply.

**3.1**
**adhesive binding**
type of binding, hard cover or soft cover, in which the signatures are milled and the separate sheets glued together by means of an adhesive

**3.2**
**adhesive line**
width of adhesive applied to a material prior to attaching it to another material

**3.3**
**alkaline buffered paper**
paper with a pH equal to or higher than 7,0, and containing a compound (e.g. calcium carbonate) at a level sufficient to neutralize acid generated from degradation of the paper, from adjacent materials, or from atmospheric pollution

**3.4**
**animal glue**
natural glue prepared by adding glycerine to high-quality hide glue

**3.5**
**bind**
to fasten sheets together and to attach them to protective covers, which may be made of a variety of materials, e.g. paper, board, cloth

**3.6**
**binder's board**
rigid, solid board, made from a base stock of paper pulp, and of a grammage of 225 g/m$^2$ or more

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1) ASTM D 5035-90, *Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Force)* is technically identical to ISO 5081.

2) May be obtained from ANSI at the address: 11 West 42nd Street, 13th floor, New York, N.Y. 10036, USA.

**3.7**
**bursting strength**
maximum uniformly distributed pressure, applied at right angles to its surface, that a test piece will stand before it breaks under the conditions defined in the standard test methods

**3.8**
**casing-in**
process of applying adhesive to the outermost endpapers of a book block and fitting the book block into its case

**3.9**
**cross-link**
setting up of chemical links between the molecular chains of polymers, resulting in embrittlement of the object

**3.10**
**endpaper**
folded sheet of paper attached to the book block, the outer sheet to face the inner side of its board; adhesive is applied to the outer page of each endsheet when the book block is cased in

**3.11**
**EVA hot-melt (Ethylene vinyl acetate co-polymer)**
thermoplastic adhesive made of ethylene vinyl acetate co-polymer, with fast-setting qualities but low resistance to environmental factors and ageing

**3.12**
**folding endurance**
logarithm (to the base of 10) of the number of double folds required to cause rupture in a strip of paper 15 mm wide tested under applied standard stress conditions

**3.13**
**forwarding**
steps in binding that take place after sewing and prior to a book being cased in; usually it includes rounding, backing and lining the spine and it may include tipping-in the endpapers

**3.14**
**gluing-off**
process of applying adhesive to the spine of the book block after sewing

**3.15**
**hard cover book**
book bound in a rigid material, usually binder's board, made either from sewn leaves or as an adhesive binding from sheets glued together

**3.16**
**hot-melt adhesive**
family of polymer adhesives often applied in commercial publisher's bindings to non-standard sewn or adhesive book blocks

NOTE — The term is often used to mean EVA hot-melt, cf. 3.11.

**3.17**
**inner margin**
unprinted space between the printed area of a page and the centrefold of the signature

**3.18**
**insert**
sheets or signatures, usually with illustrations, printed separately from the text and sewn or pasted into the book block during binding

**3.19**
**lining**
materials (cloth and paper) adhered to the spine of the book block or the spine of the case

**3.20**
**machine direction**
direction in a paper or a board corresponding to the direction of travel of the web on the paper or board machine

NOTE — Machine direction is often but not necessarily always identical with "grain direction", the direction in which the majority of fibres lie in a sheet of machine-produced paper or board.

**3.21**
**milling**
process of preparing the book block for adhesive binding by milling the binding edge

**3.22**
**nipping**
applying pressure to the book block after sewing and gluing-off the back to reduce swelling caused by the thread

**3.23**
**notching**
cutting grooves across the spine of the book block prior to the gluing process in the production of adhesive bindings, in order to increase the area of adhesion

**3.24**
**overhang**
protrusion of some leaves over others in an untrimmed book block or of the squares over a trimmed book block

**3.25**
**permanent paper**
paper which during long-term storage in libraries, archives and other protected environments will undergo little or no changes in properties that affect use

**3.26**
**PUR-melt (Polyurethane)**
melt-adhesive for binding purposes made from polyurethane and produced by emulsion polymerization

NOTE — PUR-melt differs from traditional hot-melt by having improved ageing qualities and resistance to environmental factors, as well as having better adhesive qualities, in particular on coated stock. It differs from PVAc by having faster setting.

**3.27**
**PVAc (Polyvinyl acetate emulsion)**
synthetic vinyl resin adhesive, polyvinyl acetate emulsion, produced from its monomer by emulsion polymerization

NOTE — PVAc is characterized by strong adhesive qualities and resistance to environmental factors and ageing, but has rather slow setting qualities. It differs from melt adhesives, in particular from PUR-melt, by demanding less costly binding machinery.

**3.28**
**rounding and backing**
shaping of a book block by a special machine (or by hand) after trimming and before lining

NOTE — Rounding results in the characteristic convex spine and concave fore-edge of a hard cover book. Backing causes the sewn edges of the signatures to fan out, producing a hinge for the cover boards to turn against after the book is bound.

**3.29**
**signature**
printed sheet folded to form one section of a book

NOTE — Signatures are trimmed or cut on all three open edges after the book block has been sewn. In adhesive binding, the fourth (spine) edge is also cut. A signature typically has 8 or 16 leaves (16 or 32 pages), although any multiple of 2 leaves is possible.

**3.30**
**soft cover book**
book bound in flexible material, usually paper or light board, that can be made either from sewn leaves or as an adhesive binding from sheets glued together

**3.31**
**spine inlay**
strip of paper or board used to stiffen the spine of the case of a binding

**3.32**
**squares**
board edges that extend beyond the book block at the head, tail and fore-edges of a book

**3.33**
**super**
coarse cloth glued to the back of the book block, forming the first lining of a case-bound book

NOTE — The denser the weave of the cloth, the stronger the case attachment. Super is often termed "mull" after the most commonly used cloth material.

**3.34**
**tensile strength**
maximum tensile force that a test piece will stand before it breaks under the conditions defined in the standard test methods

The definitions applied in this International Standard comply with those of ISO 4046, ISO 5127-2 and ISO 5626. They have been augmented by specialized binding terms applied in ANSI/NISO Z39.66-1989: *Durable Hard-Cover Binding for Books.*

## 4 Principles

As a consequence of their broad scope, the requirements in this International Standard are as brief and general as possible. They do not prescribe specific binding equipment or trade-mark materials. Instead they are a description of some single, but crucial, stages in the binding of books that should be closely observed if the finished volumes are to remain in good shape and be useful for years, decades or longer.

By intent, this International Standard realistically takes into account what can be efficiently produced at reasonable cost in a modern book production facility. For this reason it restricts itself to only such methods, techniques and kinds of material which are considered worldwide as a generally acceptable minimum.

Wherever possible, the requirements are stated in exact figures relating to testing methods well-known in book production plants and binderies all over the world. Any reference to board and paper is expressed in terms used by the producers or suppliers of such materials. Any specified treatment applied to cover materials is stated in terms generally known by manufacturers of such materials.

## 5 Required characteristics

The requirements for the binding materials and manufacturing methods for hard cover and soft cover books are listed in two normative annexes A and B. Also appended is a set of guidelines in annex C, containing recommendations for the production of soft cover and hard cover adhesive-bound books. The three annexes identify three different categories of binding materials and manufacturing methods.

In order to facilitate comparison between requirements/recommendations for different binding types, a uniform clause numbering structure has been adopted for all three annexes. As a consequence, a number of headings in annexes A and B do not indicate any specific recommendation for category C binding.

## 6 Statement of compliance

All book manufacturers and book binders are encouraged to use and promote the use of a statement of compliance with ISO 11800 on each binding that meets the requirements of this International Standard.

Compliance with this International Standard can be claimed only by adopting one of the two text lines which indicate compliance with the full requirements in either annex A (for category A binding) or annex B (for category B binding).

The text line shall be set in a single line in Helvetica or a similar sans-serif form of type in one line as follows:

Category A: ISO 11800 BINDING — Cat. A

Category B: ISO 11800 BINDING — Cat. B

The text line to be adopted shall be either stamped or printed in the lower right corner on the outside back board or cover of the book, and shall have a minimum height of 2 mm and maximum height of 4 mm.

Books produced in accordance with the guidelines in annex C may make known such compliance by the following statement in the colophon:

"This book has been produced in accordance with the guidelines for adhesive-bound books in ISO 11800, annex C".

# Annex A
(normative)

# Category A binding — Sewn hard cover binding

## A.1 Fields of application

Category A binding is intended for books exposed to heavy use over prolonged periods, for lasting protection of valuable books and for other hard cover books of which the binding is a significant part. e.g. bibliophile issues. (See annex D.)

## A.2 Book block requirements

### A.2.1 Paper

All paper used for the book block, including flyleaves, endpapers, spine inlays and paper for inserts, shall meet in full the specifications of ISO 9706. Differences in grammage and flexibility between the paper used for the book block and paper for inserts shall be as slight as possible. The machine direction of all paper used for the book block, including paper for inserts, shall run parallel to the binding edge.

NOTE — According to normative annex A of ISO 9706:1994, use of a symbol and a statement of compliance as described in that annex is encouraged for books printed on paper meeting the requirements of ISO 9706.

### A.2.2 Signatures

The book block shall be gathered from one or more signatures which shall all retain their folding edge. A folded signature shall not exceed 2,5 mm in thickness and shall be well pressed. If the imposition plan results in an odd-sized signature, i.e. a signature with a number of pages different from the others, this signature shall be placed between full-sized signatures.

### A.2.3 Size of book block

For convenience of use and to avoid undue strain on the binding structure, the thickness of the book block shall not exceed 64 mm.

### A.2.4 Margins

The text shall be imposed so that the inner margin measures at least 14 mm on both sides of the fold of the signature. For page sizes wider than 144 mm, each inner margin shall measure at least 1/9 of the page width.

## A.3 Binding methods

### A.3.1 Endpapers

Endpapers shall be formed from single sheets of paper folded in half. Endpapers shall be attached to the front and back signatures either by sewing or by tipping-in. If tipping-in is used, the fold of each endpaper shall line up with the fold of the signature with a tolerance of 1,5 mm. The adhesive line shall then be straight and not exceed 5 mm in width.

### A.3.2 Method of leaf attachment

The book block shall be made by sewing through the folds of the signatures. Signatures shall have as many stitches as the machine can employ, except for a distance of 10 mm from the head and 13 mm from the tail, which shall be left without stitches. The distance between stitches (discernible by measuring the spacing along the innermost fold of a signature) shall not be more than 25 mm.

### A.3.3 Inserts

Inserts of 4 leaves (8 pages) or more shall be sewn in as signatures.

### A.3.4 Fold-outs

Fold-outs, e.g. maps, larger than four times the size of the book format shall be contained in a book pocket.

### A.3.5 Nipping and trimming

The book block shall be well nipped to eliminate excess swelling, and be trimmed as squarely and slightly as possible. In cases where the book block is meant to be untrimmed, an overhang of 2 mm - 3 mm is allowed.

### A.3.6 Gluing-off the spine

The spine of the book block shall receive a coating of adhesive or glue, prior to rounding and backing. The adhesive shall thoroughly coat the spine and penetrate no further through the sewing holes than to the innermost leaf. The adhesive shall be applied at the proper consistency so that it does not seep unevenly between signatures. At no point shall the adhesive penetrate between the signatures to a depth of more than 1,0 mm.

### A.3.7 Rounding and backing

Book blocks shall be evenly rounded and backed to form a smooth, convex spine and a concave fore-edge; they shall be backed to form shoulders that are symmetrical, uniform from head to tail, and nearly equal in size to the specified board thickness. Rounding and backing is not required for book blocks less than 13 mm thick.

### A.3.8 Back lining

The lining shall be carried out either during the spine-gluing operation or during the casing-in operation. The lining material shall be evenly and securely attached to the spine. The lining material shall be mull or another cloth. Paper may only be used as a second lining on mull. The application of cloth or mull shall extend at least 20 mm onto the endpaper. The machine direction of the paper and the thread of the warp shall run parallel to the spine.

## A.4 Case construction

### A.4.1 Boards

The boards shall be cut with their machine direction running parallel to the spine of the book. The boards shall be correctly positioned on the cover material to ensure the correct spine and joint width for the case. To be correct, the joint width shall equal the thickness of the board together with three times the thickness of the cover material.

The boards shall form squares having a head and tail overhang of between 1,5 mm and 2,0 mm for book blocks up to 38 mm thick, and a maximum of 2,5 mm for book blocks more than 38 mm thick, and a fore-edge overhang of between 2,0 mm and 2,5 mm for book blocks up to 38 mm thick, and a maximum of 3,0 mm for book blocks thicker than 38 mm. See also A.3.5.

### A.4.2 Spine inlay

A spine inlay shall be used to reinforce the spine of the case. The inlay shall be cut squarely and the machine direction of the paper or board used shall run parallel to the spine of the book. The width of the inlay shall be equal

to the width of the spine plus twice the thickness of the board ± 5 %, and its height shall be equal to the height of the cover boards.

### A.4.3 Casing-in

The spine of the book block shall be positioned firmly in the spine of the case and the joints shall be tightly adhered.

### A.4.4 Absence of warping

The components of the case (cover material, boards, paper liner, casing-in adhesive, and adhered endpapers) shall form a completed book-cover structure that is free of warping. The component materials shall be applied with their machine direction or warp-thread direction running parallel to the spine of the book block.

### A.4.5 Turn-in

The cover material shall fold over the boards on all three open sides and be firmly attached, extending between 15 mm and 20 mm onto the inner boards and underneath the paste-downs.

### A.4.6 Dust jacket

If a dust jacket is employed, its fold around both boards or covers shall not be less than 1/3 the width of the cover.

### A.4.7 Book pocket

If a book pocket is employed, it shall be firmly attached to the inner back board, and comply with all of the relevant material requirements of A.2.1 and A.5.

### A.4.8 Labels

If labels are employed, they shall be firmly and securely fixed to the cover material or endpaper, using either polyvinyl acetate (PVAc) emulsion or animal glue.

## A.5 Material specifications

### A.5.1 Adhesives or glue

Adhesives or glue used for all processes shall be capable of forming a permanent bond between the surfaces to be joined.

The adhesives employed shall be either an emulsion copolymer of internally plasticized polyvinyl acetate (PVAc), that will not cross-link on long-term ageing at normal indoor temperatures (20 °C - 30 °C), or high-grade animal glue, of an interval between 390 and 530 grams Bloom, measured according to ISO 9665. Polyurethane adhesive (PUR-melt), ethylene vinyl acetate adhesive (EVA hot-melt), or similar hot-melt adhesives shall not be used.

The adhesive force shall be such that bonded materials cannot be separated without damage, neither before nor after the following sequence of exposures:

a) 72 h exposure to 54 °C ± 3 °C, and

b) 72 h exposure to – 6 °C ± 3 °C, and

c) 6 h exposure to 24 °C ± 6 °C,

except by specialist methods.

### A.5.2 Cloth

All cloth materials employed shall perform adequately with respect to their strength, flexibility and other properties required by this International Standard. The tensile strength of each cloth shall be determined by the strip method described in ISO 5081.

### A.5.3 Boards

Board material shall have a pH-value of not less than 5,5 and not more than 10,0 as tested by ISO 6588. With board material of a pH-value less than 7,0, acid migration from the boards to the book block shall be prevented by alkaline buffered endpapers of a minimum grammage of 120 g/m$^2$ and a maximum grammage of 160 g/m$^2$. The grammage shall be determined as described in ISO 536.

All board material shall have a density in the range of 0,8 g/cm$^3$ - 1,0 g/cm$^3$, measured as apparent sheet density according to ISO 534. The minimum board thickness given in Table A.1 shall be used.

**Table A.1 — Minimum board thicknesses for Category A books**

| Book block area | Book block thickness | Minimum board thickness<br>mm |
|---|---|---|
| Trimmed book block area less than 1 780 cm$^2$ | 10 mm and under | 1,5 |
| | between 10 mm and 20 mm | 1,8 |
| | between 20 mm and 25 mm | 2,0 |
| | between 25 mm and 30 mm | 2,3 |
| | between 30 mm and 38 mm | 2,6 |
| Trimmed book block area 1 780 cm$^2$ or more | 25 mm and under | 2,3 |
| | over 25 mm | 2,6 |

### A.5.4 Cover materials

All cover materials shall have a sufficiently smooth surface to avoid dust retention.

#### A.5.4.1 Paper

Cover material shall have a pH-value of not less than 5,5 and not more than 10,0 as tested by ISO 6588. With cover material of a pH-value less than 7,0, acid migration from the cover to the book block shall be prevented by alkaline buffered endpapers of a minimum grammage of 120 g/m$^2$ and a maximum grammage of 160 g/m$^2$. The grammage shall be determined as described in ISO 536.

The folding endurance of paper cover material shall be a minimum of 2,18 for MIT, Köhler-Mohlin and Lhomargy testers[3)] and 2,45 for Schopper testers[3)]. The tests shall be performed as described in ISO 5626.

#### A.5.4.2 Woven materials

Woven cover materials shall meet the requirements for their particular kind of fabric as specified in ANSI L29.1-1977.

3) MIT, Köhler-Mohlin, Lhomargy and Schopper testers are examples of suitable products available commercially. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of these products.

#### A.5.4.3 Coated and non-woven materials

Alternative cover materials may be used, provided that their pH-value is higher than 6,0 and lower than 10,0.

Protective coating may be a polyester lamination, using polyvinyl acetate (PVAc) to bond to the paper cover. The adhesive force when applied to the cover material shall meet the requirements in A.5.1 (last paragraph).

### A.5.5 Spine inlay

Inlays shall be flexible paper or board with a minimum thickness of 0,3 mm. Thickness shall be measured as described in ISO 534.

### A.5.6 Labels

If labels are employed, they shall meet the same requirements regarding their material and properties as all other parts of the book manufactured from similar materials.

### A.5.7 Dust jackets

If a paper dust jacket is employed, its materials shall meet the same requirements as specified for those particular kinds of material in A.5.4.1.

### A.5.8 Endpapers

Endpapers shall meet in full the specifications of ISO 9706. They shall have a minimum grammage of 100 g/m$^2$ and a maximum grammage of 160 g/m$^2$. Endpapers shall have a bursting strength of not less than 276 kPa, measured in accordance with ISO 2758. The cross-direction folding endurance shall be a minimum of 2,18 for MIT, Köhler-Mohlin and Lhomargy testers and 2,45 for Schopper testers. Folding endurance tests shall be performed as described in ISO 5626. The grammage shall be determined as described in ISO 536.

### A.5.9 Super

Super shall be tape-style cotton fabric, weighing not less than 125 g/m$^2$. The cloth shall have not less than 18 warp threads and not less than 15 filler threads per centimetre. Deviations from a right-angled grid is tolerated up to one thread in each direction per centimetre of cloth. It shall have a tensile strength, as measured by ISO 5081 of not less than 95 N per centimetre of cloth for warp threads and not less than 74 N per centimetre of cloth for filling threads.

### A.5.10 Back liner

Back liners shall have a bursting strength of not less than 310 kPa, as measured by ISO 2758.

### A.5.11 Thread

Thread for sewing shall be linen, cotton, nylon, or cotton-covered polyester, and shall be of an appropriate calibre to control the swell. Breaking load shall be not less than 15 N. If the thread does not break when tested with a static load of 1,5 kg for 5 s, it fulfils the requirement.

### A.5.12 Titling materials

Metal foil or inks used for stamping or printing on the cover material shall be lightfast and acid-free with a pH-value (where applicable) between 7,0 and 10,0. Lightfastness shall be determined according to ISO 2835. The pH of the printing inks shall be guaranteed by the manufacturer.

# Annex B
(normative)

# Category B binding — Sewn soft cover binding

## B.1 Fields of application

Category B binding is intended for soft cover books subject to normal use, including constant or heavy use (see annex D). The book manufacturer's assumption should be that the owner of category B books will wish to own and keep these books in good condition for a lifetime, most often in their original soft cover. In libraries these books, sooner or later, will need repair or re-binding. Category B books, therefore, should lend themselves easily to being repaired and also to being individually bound in hard cover.

## B.2 Book block requirements

### B.2.1 Paper

All paper used for the book block, including cover stock and paper for inserts and spine inlays, shall meet in full the specifications of ISO 9706. Differences in grammage and flexibility between the paper used for the book block and paper for inserts shall be as slight as possible. The machine direction of all paper used for the book block, cover material and paper for inserts and spine inlays shall run parallel to the binding edge.

NOTE — According to normative annex A of ISO 9706:1994, use of a symbol and a statement of compliance as described in that annex is encouraged for books printed on paper meeting the requirements of ISO 9706.

### B.2.2 Signatures

The book block shall be gathered from one or more signatures which shall all retain their folding edge. A folded signature shall not exceed 2,5 mm in thickness and shall be well pressed. If the imposition plan results in an odd-sized signature, this signature shall be placed between full-sized signatures.

### B.2.3 Size of book block

For convenience of use and to avoid strain on the binding structure, the thickness of the book block shall not exceed 64 mm.

### B.2.4 Margins

The text shall be imposed so that the inner margin measures at least 14 mm on both sides of the fold of the signature. For page sizes wider than 144 mm, each inner margin shall measure at least 1/9 of the page width. The imposition of the text matter shall leave at least one free, non-printed leaf at either end of the book block.

## B.3 Binding methods

### B.3.1 Endpapers

Endpapers are not mandatory. Endpapers shall, if used, be formed from single sheets of paper folded in half. Endpapers shall be attached to the front and back signatures either by sewing or by tipping-in. If tipping-in is used, the fold of each endpaper shall line up with the fold of the signature with a tolerance of 1,5 mm. The adhesive line shall then be straight and not exceed 5 mm in width. If endpapers are not used, B.2.4 shall be observed.

### B.3.2 Method of leaf attachment

The book block shall be made by sewing through the folds of the signatures. Signatures shall have as many stitches as the machine can employ, except for a distance of 10 mm from the head and 13 mm from the tail, which shall be left without stitches. The distance between stitches (discernible by measuring the spacing along the innermost fold of a signature) shall not be more than 25 mm. Publications folded from a single signature may be stapled with stainless steel staples through the fold.

### B.3.3 Inserts

Inserts of 4 leaves (8 pages) or more shall be sewn in as signatures.

### B.3.4 Fold-outs

Fold-outs, e.g. maps, larger than four times the size of the book format shall be contained in a book pocket.

### B.3.5 Nipping and trimming

The book block shall be well nipped to eliminate excess swelling, and be trimmed as squarely and slightly as possible. In cases where the book block is meant to be untrimmed, an overhang of 2 mm - 3 mm is allowed.

### B.3.6 Gluing-off the spine

The spine of the book block shall receive a coating of polyvinyl acetate emulsion adhesive (PVAc), or flexible glue. The adhesive shall coat the spine and penetrate no further through the sewing holes than to the innermost leaf. The adhesive shall be applied at the proper consistency so that it does not seep unevenly between signatures. At no point shall the adhesive penetrate between the signatures to a depth of more than 1,0 mm.

### B.3.7 Rounding and backing

Not relevant.

### B.3.8 Back lining

Back lining is not mandatory. If back lining is used, it shall be carried out during the spine-gluing operation. The lining material shall be evenly and securely attached to the spine. The lining material shall be mull or another cloth. Paper may only be used as a second lining on mull. The application of cloth or mull shall extend at least 20 mm onto the endpapers. The machine direction of the paper and the thread of the warp shall run parallel to the spine.

## B.4 Cover construction

### B.4.1 Cover stock

The cover material, whether paper or light board, shall be cut with the machine direction running parallel to the spine. Overhang is permissible, and if present it shall not be greater than 3,0 mm on all three open sides.

### B.4.2 Spine inlay

Not relevant.

### B.4.3 Cover attachment

The spine of the book block shall be positioned firmly into the covers.

### B.4.4 Absence of warping

The components of the cover stock (and its likely coating) shall be free of any warping, blistering or loosening. The component materials shall be applied with their machine direction or warp-thread direction running parallel to the spine of the book block.

### B.4.5 Turn-in

Not relevant.

### B.4.6 Dust jacket

If a dust jacket is employed, its fold around both boards or covers shall not be less than 1/3 the width of the covers.

### B.4.7 Book pocket

If a book pocket is employed, it shall be firmly attached to the inner back cover, and comply with all of the relevant material requirements of B.2.1 and B.5.

### B.4.8 Labels

If labels are employed, they shall be firmly and securely fixed to the cover material or endpaper, using either polyvinyl acetate (PVAc) emulsion or animal glue.

## B.5 Material specifications

### B.5.1 Adhesives or glue

Adhesives used for all processes shall be capable of forming a permanent bond between the surfaces to be joined.

The adhesive used for gluing-off the spine following sewing shall be either a polyvinyl acetate (PVAc) emulsion that will not cross-link on long-term ageing at normal indoor temperatures (20 °C - 30 °C), or animal glue, of an interval between 390 and 530 grams Bloom, measured according to ISO 9665. Polyurethane adhesive (PUR-melt), ethylene vinyl acetate adhesive (EVA hot-melt), or similar hot-melt adhesives shall not be used.

The adhesive force shall be such that bonded materials cannot be separated without damage, neither before nor after the following sequence of exposures:

a) 72 h exposure to 54 °C ± 3 °C, and

b) 72 h exposure to – 6 °C ± 3 °C, and

c) 6 h exposure to 24 °C ± 6 °C,

except by specialist methods.

### B.5.2 Cloth

Not relevant.

### B.5.3 Cover stock

For the flexible cover materials, the minimum cover grammage given in Table B.1 shall be used. The grammages shall be determined according to ISO 536. See also B.5.4.

**Table B.1 — Minimum cover grammages for Category B books**

| Book block area | Book block thickness | Cover grammage $g/m^2$ |
|---|---|---|
| Trimmed book block area less than 1 780 $cm^2$ | 10 mm and under<br>between 10 mm and 20 mm<br>between 20 mm and 25 mm | 200<br>225<br>350 |
| Trimmed book block area equal to or above 1 780 $cm^2$ | 25 mm and under<br>over 25 mm | 375<br>400 |

## B.5.4 Cover materials

All cover stock shall have a smooth surface.

### B.5.4.1 Paper

Paper cover materials shall meet in full the specifications of ISO 9706. The folding endurance of paper cover material shall be a minimum of 2,18 for MIT, Köhler-Mohlin and Lhomargy testers and 2,45 for Schopper testers. The tests shall be performed as described in ISO 5626.

### B.5.4.2 Woven materials

Not relevant.

### B.5.4.3 Coated and non-woven materials

Alternative cover materials may be used, provided that their pH-value is higher than 6,0 and lower than 10,0, and provided that they are not in any other way detrimental to the paper used for the book block.

Protective coating may be a lamination with either polyvinyl acetate (PVAc) or polyester, firmly bonded to the paper cover. The adhesive force shall meet the requirements in the last paragraph of B.5.1. The folding endurance of laminated cover hinges shall be a minimum of 2,18 for MIT, Köhler-Mohlin and Lhomargy testers and 2,45 for Schopper testers, when tested as described in ISO 5626.

### B.5.5 Spine inlay

Not relevant.

## B.5.6 Labels

If labels are employed, they shall meet the same requirements regarding their material and properties as all other parts of the book manufactured from similar materials. They shall be firmly and securely fixed to the cover material or endpaper, using polyvinyl acetate (PVAc) emulsion, or animal glue.

## B.5.7 Dust jackets

If a loose dust jacket is employed, it shall be free of any constituent parts or added imprint that can be harmful to the book block and book cover materials.

## B.5.8 Endpapers

If endpapers are used, they shall meet in full the specifications of ISO 9706. They shall have a minimum grammage of 100 $g/m^2$ and a maximum grammage of 160 $g/m^2$. Endpapers shall have a bursting strength of not less than 276 kPa, measured in accordance with ISO 2758. The cross-direction folding endurance shall be a minimum of 2,18 for MIT, Köhler-Mohlin and Lhomargy testers and 2,45 for Schopper testers. Folding endurance tests shall be performed as described in ISO 5626. The grammage shall be determined as described in ISO 536.

#### B.5.9 Super

Not relevant.

#### B.5.10 Back liner

Not relevant.

### B.5.11 Thread

Thread for sewing shall be linen, cotton, nylon, or cotton-covered polyester, and shall be of an appropriate calibre to control the swell. Breaking load shall be not less than 15 N. If the thread does not break when tested with a static load of 1,5 kg for 5 s, it fulfils the requirement.

### B.5.12 Titling materials

Metal foil or inks used for stamping or printing on the cover material shall be lightfast and acid-free with a pH-value (where applicable) between 7,0 and 10,0. Lightfastness shall be determined according to ISO 2835. The pH of the printing inks shall be guaranteed by the manufacturer.

# Annex C
(informative)

# Guidelines for the production of soft cover and hard cover adhesive-bound books

## C.1 Fields of application

These guidelines are intended for hard cover or soft cover books, subjected to normal use, but not intended primarily for a library or academic environment (see annex D). However, they shall lend themselves easily to being rebound if needed for longer-term use. This requires a reasonably wide inner margin since the spine may be milled in the process of rebinding. This category of books is produced by means of fully automated perfecting machinery and in large editions that keep the production costs at a minimum.

These guidelines are recommendations, and do not constitute requirements that are part of this International Standard, cf. clause 5. For reasons of expediency, explained in the Introduction, the clause numbering structure in annexes A and B has been maintained in annex C, irrespective of their status.

## C.2 Book block requirements

### C.2.1 Paper

All paper used for the book block, including endpapers, spine inlays and paper for inserts, shall meet the specifications of ISO 9706, except for those in subclause 5.4. Paper containing lignin is acceptable if its Kappa number is less than 20,0, measured according to ISO 302. Differences in grammage and flexibility between the paper used for the book block and paper for inserts shall be as slight as possible. The machine direction of all paper used for the book block, including endpapers and paper for inserts, shall run parallel to the binding edge.

NOTE — According to normative annex A of ISO 9706:1994, use of a symbol and a statement of compliance as described in that annex is encouraged for books printed on paper meeting the requirements of ISO 9706.

### C.2.2 Signatures

Not relevant.

### C.2.3 Size of book block

For convenience of use and to avoid strain on the binding structure, the thickness of the book block shall not exceed 64 mm.

### C.2.4 Margins

The text shall be imposed so that the inner margin measures at least 18 mm on each page. For page sizes wider than 162 mm, each inner margin shall measure at least 1/9 of the page width.

## C.3 Binding methods

### C.3.1 Endpapers

Endpapers are not mandatory. Endpapers are recommended for heavy and/or large-sized hard cover books. Endpapers may be formed either from single sheets of paper folded in half at each end of the book block, or made up by free leaves at each end of the book block. The fold of separate endpapers shall line up with the spine edge of the book block with a tolerance of 2,5 mm. The adhesive line shall be straight and not exceed 5 mm in width.

### C.3.2 Method of leaf attachment

The mechanical treatment of the spine (milling, notching, sanding, etc.) and the choice of paper shall be adjusted according to the properties of the glue, which together give each leaf the necessary adherence in the binding edge, cf. C.5.1. The spine of the book block shall receive a coating of polyvinyl acetate emulsion adhesive (PVAc) or polyurethane adhesive (PUR-melt). The adhesive shall coat the spine thoroughly. The adhesive shall be applied at the correct consistency so that it does not seep unevenly between the sheets. At no point shall the adhesive penetrate between the sheets to a depth of more than 2 mm.

### C.3.3 Inserts

Inserts shall be produced on paper of the same weight or less than the text block.

### C.3.4 Fold-outs

Fold-outs produced on paper heavier than the paper used for the text block shall be contained in a book pocket.

### C.3.5 Nipping and trimming

The book block shall be trimmed as squarely and slightly as possible.

### C.3.6 Gluing-off the spine

See C.3.2.

### C.3.7 Rounding and backing

Not mandatory in hard cover books, and not relevant for soft cover books.

### C.3.8 Back lining

If back lining applies, it shall be evenly and securely attached to the spine. The machine direction of the back lining paper shall run parallel to the spine, and the lining shall be applied to within 4 mm of the head and tail.

## C.4 Cover construction

### C.4.1 Boards or cover

For hard cover books, the boards shall be cut with their machine direction running parallel to the spine of the book. The boards shall be correctly positioned on the cover material to ensure the correct spine and joint width for the case.

For soft cover books, the material for paper or board covers (cover stock with a grammage of less than 225 g/m$^2$) shall be cut with the machine direction running parallel to the spine of the book.

### C.4.2 Spine inlay

In hard cover books, a spine inlay shall be used to reinforce the spine of the case. The inlay shall be cut squarely and the machine direction of the paper or board used shall run parallel to the spine of the book. The width of the inlay shall be equal to the width of the spine ± 5 %, and its height shall be equal to the height of the cover boards.

### C.4.3 Casing-in

The spine of the book block shall be positioned firmly onto the spine of the case or cover material and any joints shall be tightly adhered. A soft cover shall have creases along both spine edges to facilitate opening.

### C.4.4 Absence of warping

The components of the volume (cover material, boards, paper cover, liner, casing-in adhesive, and adhered endpapers) together shall form a completed book-cover structure that is free of warping.

### C.4.5 Turn-in

In hard cover books, the cover material shall fold over the boards on all three open sides and be firmly attached, extending between 15 mm and 20 mm onto the inner boards and underneath the paste-downs.

### C.4.6 Dust jacket

If a dust jacket is employed, its fold around both boards or covers shall not be less than 1/3 the width of the cover.

### C.4.7 Book pocket

If a book pocket is employed, it shall be firmly attached to the inner back board or cover, and comply with all of the relevant material requirements of C.2.1 and C.5.

### C.4.8 Labels

If labels are employed, they shall be firmly and securely fixed to the cover material or endpaper.

## C.5 Material specifications

### C.5.1 Adhesives or glue

Adhesives used for all processes shall be capable of forming a durable bond between the surfaces to be joined.

The adhesive used shall be either a polyvinyl acetate (PVAc) emulsion, that will not harden (cross-link) on long-term ageing at normal temperature (20 °C - 30 °C), or a polyurethane adhesive (PUR-melt), of an interval between 390 and 530 grams Bloom, measured according to ISO 9665. Ethylene vinyl acetate (EVA emulsion), or similar hot-melt adhesives shall not be used.

The adhesive force shall be such that bonded materials cannot be separated without damage, neither before nor after the following sequence of exposures:

a) 72 h exposure to 54 °C ± 3 °C, and

b) 72 h exposure to – 6 °C ± 3 °C, and

c) 6 h exposure to 24 °C ± 6 °C,

except by specialist methods.

### C.5.2 Cloth

All cloth materials employed shall perform adequately with respect to their strength, flexibility and other required properties. When testing the tensile strength of cloth, the strip method in ISO 5081 shall be used.

### C.5.3 Other board or cover stock

All board or cover stock employed shall have a smooth surface.

### C.5.4 Cover materials

#### C.5.4.1 Paper

Paper cover materials shall conform with the paragraphs of ISO 9706 that apply to Category C books, cf. C.2.1, implying that alkaline-buffered paper containing lignin is acceptable if the Kappa number is lower than 20,0. The folding endurance of paper cover material shall be a minimum of 2,18 for MIT, Köhler-Mohlin and Lhomargy testers and 2,45 for Schopper testers. The tests shall be performed as described in ISO 5626.

#### C.5.4.2 Woven materials

No requirements except those stated in C.5.2. The adhesive force when applied to supporting cover material shall meet the requirements in C.5.1.

#### C.5.4.3 Coated and non-woven materials

Alternative cover materials may be used, provided that they meet the requirements in C.5.2. Protective coating shall be a polyester lamination, using polyvinyl acetate (PVAc) to bond to the paper cover. The adhesive force when applied to supporting cover material shall meet the requirements in C.5.1.

### C.5.5 Spine inlay

No requirements.

### C.5.6 Labels

Labels shall meet the same requirements regarding their materials and properties as all other parts of the book manufactured from similar materials. They shall be firmly and securely fixed to the cover material or endpaper, using polyvinyl acetate (PVAc) emulsion.

### C.5.7 Dust jackets

If a dust jacket is employed, its materials shall meet the same requirements as specified for the relevant kinds of material in C.5.4.

### C.5.8 Endpapers

No requirements.

### C.5.9 Super

Not mandatory.

### C.5.10 Back liner / liner for the case

No requirements.

### C.5.11 Thread

Not relevant.

### C.5.12 Titling materials

No requirements.

# Annex D

(informative)

## Recommendations concerning fields of application

Category A binding, sewn hard cover binding, is recommended for the following types of publication:

— First edition works in their original language and which are expected to become important.

— Scholarly monographs.

— Complete editions of the works of important authors in their own language or in scholarly translations from ancient languages.

— Reference books which may have lasting importance.

— Books intended primarily for the library market.

Category B binding, sewn soft cover binding, is recommended for the following types of publication:

— First edition works in their original language and which are expected to become important. Binding type to be chosen as a less expensive alternative to Category A.

— Scholarly monographs in soft covers, as a less expensive alternative to Category A books.

— First editions of important fiction or non-fiction for a very small market.

— Scholarly journals, professional journals and quality magazines for the general reading market.

Category C binding, adhesive binding, is recommended for the following types of publication:

— Hard cover or soft cover reprintings of popular fiction or non-fiction at low cost.

— Hard cover or soft cover, low-cost reprintings of books of current interest, that have originally appeared as category A or B books.

— Publications which by their own nature are superseded after a few years, e.g. telephone directories and travel literature.

— Quality paperbacks in general.

**ICS 01.140.40**

**Descriptors:** documentation, publications, books, book production, binding, categories, specifications, characteristics.

Price based on 21 pages