

UGANDA STANDARD

First Edition
2008-09-08

Scholastic stationery — Specification



Reference number
US 820: 2008

© UNBS 2008

Compliance with this standard does not, of itself confer immunity from legal obligations

A Uganda Standard does not purport to include all necessary provisions of a contract. Users are responsible for its correct application

© UNBS 2008

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilised in any form or by any means, electronic or mechanical, including photocopying and microfilm, without prior written permission from UNBS.

Requests for permission to reproduce this document should be addressed to

The Executive Director
Uganda National Bureau of Standards
P.O. Box 6329
Kampala
Uganda
Tel: 256 414 505 995
Fax: 256 414 286 123
E-mail: unbs@infocom.co.ug
Web: www.unbs.go.ug

Contents

Page

Foreword	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Materials	2
4.1 Paper	2
4.2 Additional requirement for drawing paper	3
4.3 Interleaving paper	3
4.4 Covers	3
4.4.1 Soft covers	3
4.4.2 Hard covers	4
4.5 Binding wire and staples	4
4.5.1 Binding wire	4
4.5.2 Staples	4
4.6 Sewing threads, spine-reinforcing materials, binding tapes and adhesives	4
4.7 End-leaves of hard-cover books	4
5 General requirements for books	5
5.1 Type	5
5.2 Dimensions	5
5.3 Format	5
5.4 Number of pages	6
5.5 Grades of paper and number of pages of each grade	6
5.5.1 Grades of paper and number of pages of each grade	6
5.5.2 Allowance of better than minimum requirements	9
5.6 Type of cover	9
5.7 Ruling	9
5.7.1 General	9
5.7.2 Feint, Irish, quad and wide ruling	13
5.7.3 Top and bottom margins	13
5.7.4 Side margins	14
5.8 Binding	14
5.8.1 General	14
5.8.2 Soft-cover books	14
5.8.3 Hard-cover books	15
5.9 Printing	16
6 Specific requirements for books	16
6.1 General-exercise and scribbling books	16
6.1.1 General	16
6.1.2 Ruling on alternate pages	16
6.2 Accountancy books	16
6.3 Graph books	16
6.3.1 Types of ruling on leaves	16
6.3.2 Ruling of pages for graphs	16
6.3.3 Ruling of pages for writing	17
6.4 Drawing books	17
6.4.1 With interleaving paper	17
6.4.2 Without interleaving paper	17
6.5 Shorthand notebooks	17
6.6 Biology and nature study books	17

6.7	Music books	17
6.8	Theme books	17
6.9	Mapping books.....	17
6.10	Examination answer books	18
6.10.1	Internal examination books	18
6.10.2	External examination books	18
6.11	Index books	18
6.11.1	Fully indexed	18
6.11.2	Partly indexed	19
7	Specific requirements for ruled sheets of paper	19
7.1	Type.....	19
7.2	Material	19
7.2.1	Minimum requirements	19
7.2.2	Allowance of better than minimum requirements	19
7.3	Dimensions.....	19
7.4	Collating of fly sheets	19
7.5	Ruling.....	19
8	Sampling and compliance with the specification.....	20
8.1	Sampling.....	20
8.1.1	General.....	20
8.1.2	Sample for inspection of packing and marking.....	20
8.1.3	Sample for inspection of books and packets of paper	20
8.1.4	Sample for testing.....	21
8.2	Compliance with the specification.....	21
8.2.1	Books	21
8.2.2	Sheets	21
9	Inspection, conditioning and methods of test	22
9.1	Inspection of packing and marking	22
9.2	Conditioning.....	22
9.3	Inspection of books	22
9.3.1	Examination.....	22
9.3.2	Number of pages.....	22
9.3.3	Dimensions of books	22
9.3.4	Ruling.....	23
9.3.5	Staple binding	25
9.3.6	Binding of hard-cover books.....	25
9.3.7	Binding of wire-bound books (shorthand notebooks).....	25
9.3.8	Position of perforations in internal examination books	25
9.3.9	Size of letters and cut-outs in index books	26
9.3.10	Length of extension of back cover of external examination books	26
9.3.11	Flushness of covers	26
9.4	Inspection of sheets of paper.....	26
9.4.1	Number of sheets per packet	26
9.4.2	Examination.....	26
9.4.3	Dimensions of sheets.....	26
9.4.4	Ruling.....	26
9.5	Testing of materials and performance of books	26
9.5.1	Grammage	26
9.5.2	Apparent bulk density of cover board.....	26
9.5.3	Resistance to internal tearing	27
9.5.4	Quality of sewing threads, spine-reinforcing materials, binding tapes and adhesives	27
9.5.5	Quality of binding	28
9.5.6	Fibre composition.....	28
9.5.7	Brightness of paper	28
9.5.8	Brightness of paper after aging	28
9.5.9	Opacity of paper.....	28
9.5.10	Bursting strength.....	28
9.5.11	Performance of perforations in internal examination books	28

10	Packing and marking	29
10.1	Packing.....	29
10.1.1	Packets	29
10.1.2	Bulk containers.....	29
10.2	Marking of packed books	29
10.2.1	Packets	29
10.2.2	Bulk containers.....	29
10.3	Marking of packets of ruled sheets of paper	29
10.3.1	Packets	29
10.3.2	Bulk containers.....	30
Annex A (normative)	Notes to purchasers	31
A.1	Books.....	31
A.2	Sheets.....	31

Foreword

Uganda National Bureau of Standards (UNBS) is a parastatal under the Ministry of Tourism, Trade and Industry established under Cap 327, of the Laws of Uganda. UNBS is mandated to co-ordinate the elaboration of standards and is

- (a) a member of International Organisation for Standardisation (ISO) and
- (b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and
- (c) the National Enquiry Point on TBT/SPS Agreements of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of representatives of consumers, traders, academicians, manufacturers, government and other stakeholders.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

Committee membership

The following organisations were represented on the Technical Committee for Chemicals and environment standards, UNBS/TC 5 in the development of this standard:

- Graphic Systems (U) Ltd
- Kendo Mills
- Kengroup
- Picfare Industries Ltd.
- Riley Packaging (U) Ltd
- Transpaper
- Uganda National Bureau of Standards
- Uganda Printers Association

Scholastic stationary — Specification

1 Scope

This specification covers several types of books and sheets of paper intended for scholastic and related uses. It specifies the covers, the bindings, the grades of paper and the types of ruling.

NOTE The information to be specified in tender invitations and in each order or contract is listed in Annex A.

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.

US ISO 186, *Paper and board — Sampling to determine average quality*

US ISO 187, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

US ISO 216, *Writing paper and certain classes of printed matter — Trimmed sizes — A and B series and indication of machine direction*

US ISO 534, *Paper and board — Determination of thickness, density and specific volume*

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

US ISO 1974, *Paper — Determination of tearing resistance (Elmendorf method)*

US ISO 2470, *Paper and board — Measurement of diffuse blue reflectance factor (ISO brightness)*

US ISO 2471, *Paper and board — Determination of opacity (paper backing) — Diffuse reflectance method*

US ISO 2758, *Paper — Determination of bursting strength*

ISO 353, *Processed writing paper and certain classes of printed matter — Method of expression of dimensions*

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

ISO 9184-3, *Paper, board and pulps — Fibre furnish analysis — Part 3: Herzberg staining test*

3 Terms and definitions

For the purposes of this standard, the definitions given below, the nomenclature pertaining to books as indicated in Figure 8, and the nomenclature given in US ISO 216, ISO 353 and ISO 4046 apply, with the provision that the definitions given below shall be preferred over possible alternative definitions given in the ISO specifications.

US 820: 2008

- 3.1 acceptable**
acceptable to the purchaser
- 3.2 chemical**
when used to describe paper or paper fibres, denotes a derivation from chemical pulp
- 3.3 chemical pulp**
defined as in ISO 4046, but with the provision that it may contain at most 5 % by mass of mechanical pulp
- 3.4 defective**
corrugated board container, a packet, a book, a sheet of paper, or a group of books or group of sheets of paper of which the average property has been determined, that fails in one or more respects to comply with the relevant requirements of this specification acceptable to the purchaser
- 3.5 grammage**
mass per unit area of sheet material, expressed in grams per square metre
- 3.5.1 grammage actual**
average grammage obtained on a sample of paper under specified test conditions and that would normally be within $\pm 5\%$ of the nominal grammage
- 3.5.2 grammage nominal**
designated grammage of paper, that is used for reference purposes
- 3.6 leaf**
part of a sheet of paper in a book which extends from the binding edge of the book towards the front edge of the book.
- 3.7 lot**
at least five containers or packets containing nominally identical books, or at least five containers or packets containing nominally identical sheets of paper
- 3.8 mechanical**
when used to describe paper or paper fibres, denotes a derivation from mechanical pulp
- 3.9 page**
one of the opposite faces of a leaf
- 3.10 quad**
ruling of a page into nominally 7 mm squares, commonly called "quadruling"

4 Materials

4.1 Paper

All paper shall

- a) comply with the relevant requirements of Table 1,
- b) be acceptably free from defects such as fibre bundles, holes, wood splinters, specks and breaks, and
- c) accept writing media such as pencils and ballpoint pens without exhibiting any strike-through or undue signs of feathering or spread.

Table 1 — Requirements for physical properties of writing and drawing paper

Property	Writing paper				Drawing paper (Chemical cartridge)	Test method Sub-clause
	Grade A (Chemical wove)	Grade B (Mechanical wove)	Grade C (Chemical cartridge)	Grade D (Newsprint)		
Grade	Grade A (Chemical wove)	Grade B (Mechanical wove)	Grade C (Chemical cartridge)	Grade D (Newsprint)	(Chemical cartridge)	9.5.6
Grammage, g/m ²						
a) Nominal	58	60	105	47	90	-
b) Actual, min.	55	57	100	42	85	9.5.1
Bursting strength, kPa, min.	90	65	90	40	90	9.5.10
Opacity, %, min.	78	90	-	90	-	9.5.9
Brightness, %, min.						
a) Initial	75	65	80	-	80	9.5.7
b) After aging	-	50	-	-	-	9.5.8
Colour	White	Cream	White	Natural	White	-

4.2 Additional requirement for drawing paper

In addition to complying with the requirements of 4.1, drawing paper shall accept all commonly used drawing media without exhibiting undue signs of strike-through, feathering or spread.

4.3 Interleaving paper

Interleaving paper shall be light-weight, of natural colour, uncreased and acceptably free from other defects that could impair its serviceability.

4.4 Covers

4.4.1 Soft covers

The material for soft covers shall be a paper that complies with the requirements given in Table 2, appropriate to the type of soft cover. In the case of SO material and S1 material for books for external examinations, the colour shall be as specified by the purchaser

Table 2 — Requirements for physical properties of covers

Property	Type of soft cover				Hard cover ¹⁾	Test method Sub-clause
	S0	S1	S2	S3		
Grammage, g/m ² , min.	55	95	135	165	800	9.5.1
Apparent bulk density, kg/m ³ , min.	-	-	-	-	560	9.5.2
Bursting strength, kPa, min.	90	-	-	-	-	9.5.10
Internal tearing resistance (in each direction), mN, min.	-	600	1 000	1 400	-	9.5.3
¹⁾ After attachment of end-leaf.						

4.4.2 Hard covers

The material for hard covers shall be a board that is faced or painted on the outside with a scuff-resistant black paper or black paint. The board and facing shall be such that a cover, after attachment of the end-leaf, complies with the relevant requirements in Table 2.

4.5 Binding wire and staples

4.5.1 Binding wire

Binding wire shall be a wire of acceptable quality that has been so coated or plated as to render it corrosion resistant under normal conditions of use, and that is of diameter, measured in accordance with 9.3.7.3, at least 0.7 mm.

4.5.2 Staples

Staples shall be of a wire that complies with the requirements of 4.5.1, except that its diameter, measured in accordance with 9.3.5.2, shall be at least 0.4 mm. The overall crown length of staples in a book shall be at least 12 mm, and the exposed length of the clinched ends of the staples shall each be at least 5 mm.

4.6 Sewing threads, spine-reinforcing materials, binding tapes and adhesives

Sewing threads, spine-reinforcing materials, binding tapes and adhesives used in the binding of hard cover books shall be of acceptable quality and such that when books are tested in accordance with 9.5.4 and 9.5.5, the books show not more than slight signs of wear.

4.7 End-leaves of hard-cover books

An end-leaf of a partly indexed book shall be of a paper that complies with the requirements in Table 2 for an S3 soft-cover material. An end-leaf of all other hard-cover books shall be a leaf from the first or last section of the book, as relevant, or shall be of a white paper that complies with the requirements

- a) for the grade of writing paper used in the book, or
- b) for white drawing paper.

5 General requirements for books

5.1 Type

Books shall be of one of the following types (see also table 4), as specified by the purchaser (see A.1 (a) of Annex A):

- a) general exercise;
- b) scribbling;
- c) accountancy
- d) graph;
- e) drawing:
 - without interleaving paper; and
 - with interleaving paper;
- f) shorthand notebook (stenographer);
- g) biology and nature study;
- h) music;
- i) theme;
- j) mapping;
- k) examination answer:
 - internal examination; and
 - external examination;
- l) index:
 - fully indexed; and
 - partly indexed.

5.2 Dimensions

The width and height of a book (see Figure 8) shall conform to the values given in Table 3, appropriate to its format.

5.3 Format

The format of books shall be the appropriate format given in Table 4 or, where more than one format is given for a type of book, the format shall be the format (in Table 4) specified by the purchaser (see A.1.(b) of Annex A).

Table 3 — Format dimensions

Format	Dimensions ¹⁾ , mm		Test method Sub-clause
	Width	Height	
A5	148	210	9.3.3
A5L	210	148	
A5T ²⁾	148	210	
A4	210	297	
A4L	297	210	
A3L	420	297	
Ex Book	160	210	
Book	210	262	
¹⁾ Subject to a tolerance of ± 5 mm ²⁾ Bound along a top edge			

5.4 Number of pages

Except in the case of books for external examinations, the nominal number of pages shall be the appropriate number or, when applicable, one of the appropriate numbers in Table 4, as specified by the purchaser (see A.1(c) of Annex A). Books for external examinations shall contain the number of pages specified by the purchaser. In the case of section-sewn hard cover books bound in accordance with 5.8.3.2.1, the pasted-down end-leaves shall each be counted as two pages.

5.5 Grades of paper and number of pages of each grade

5.5.1 Grades of paper and number of pages of each grade

The grade(s) of paper in a book and, when applicable, the number of pages of each grade, shall be as specified in Table 4, and each grade shall comply with the relevant requirements in Table 1. In the case of general exercise, accountancy and graph books, shorthand notebooks, biology and nature study books, theme, internal and external examination books, and fully or partly indexed books, the grade of paper shall be as specified by the purchaser(see A.1.(d) of Annex A)

Table 4 — Requirements specific to type of book

Type of book (see 5.1)	Format (see Table 3)	Nominal number of pages (see 5.4)	Grade of writing paper (see Table 1) ¹⁾	Number of pages of writing paper (see 5.5)	Number of pages of drawing paper (see 5.5)	Number of pages of interleaving paper (see 5.5)	Type of cover (see Table 2)	Type of ruling (see 5.7) when and as required (see Clause 6)
General exercise (see 6.1)	A5	32, 48 or 72	B	32, 48 or 72	}	}	S1	a) Unruled, or b) ruled 1) feint, Irish, wide or quad, 2) with or without margin line, and 3) every page or alternate pages only
	A5L	32, 48 or 72	B	32,48 or 72				
	A4	32	A	32				
	A4	72	A	72				
	A5	96,128 or 192	A	96,128 or 192				
	A4	96,128 or 192	A	96,128 or 192				
Scribbling (see 6.1)	A5	32 or 48	D	32 or 48	}	}	S1	
	A5L	32 or 48	D	32 or 48				
	A4	32 or 48	D	32 or 48				
	A4	72	D	72				
Accountancy (see 6.2)	A4	72	A	72	}	}	S2	Double-column ledger, treble-column cash journal, six-column analysis, eight-column cash journal, eight-column creditor's journal or eight-column accounting journal
	A4	192	A	192				
Graph (see 6.3)	A4	36	A	36))	S1	Alternately feint with margin line, and graph.
Drawing (without interleaving paper, see 6.4.2)	A4L	24	})	24)	S1	Unruled
	A4L	48)	48)	S1	
	A3L	32)	32)	S2	
Drawing (with interleaving paper, see 6.4.1)	A4L	48))	24	24/24	S1	Unruled
	A3L	72))	36	36/36	S2	
Shorthand notebooks (see 6.5)	A5T	144	A	144))	S3	a) Feint, and b) with or without dividing line

Table 4 continued

Biology & nature study (see 6.6)	A5	48	A	24	24	}	S2	a) Feint or Irish, and b) with or without margin line
	A4	72	A	36	36		S2	
	A4	96	A	48	48		Hard	
Music (see 6.7)	A5L	32	C	32	)	)	S	Ruled for music
	A4	32	C	32	)	)	S2	
Theme (see 6.8)	A4L	72 = 24 + 24 + 24	A	24	24	24	S2	a) Feint, and b) with or without margin line
Mapping (see 6.9)	A4L	36 or 48	)	)	36 or 48	)	S1	With or without border lines
Internal examination (see 6.10.1)	A4	20 or 32	A	32	)	)	S1	a) Feint, and b) with or without margin line
External examination (see 6.10.2)	A4	As specified by the purchaser (see A.1.(c) of Annex A)	A	As specified by the purchaser (see A.1.(c) of Annex A)	)	)	S0 (20 pages or less) S1 (over 20 pages)	a) Feint, with left-hand and right-hand margin lines, and ruled both sides or right-hand pages only; or b) double-column ledger, treble-column cash journal, six-column analysis, eight-column cash journal, eight-column creditor's journal, or eight-column accounting journal
Fully indexed (see 6.11.1)	A4	96 or 192	A	96 or 192	)	)	Hard	Feint
Partly indexed (see 6.11.2)	A4	288 or 368	A	288 or 368	)	)	Hard	Feint
1) As specified by the purchaser (see A.I.(d) of Annex A)								

Table 4 completed

5.5.2 Allowance of better than minimum requirements

In all cases manufacturers may, at their discretion, use chemical paper where mechanical paper is required, and may use a higher grammage than the minimum grammage required, provided that only one grade and one grammage are used in the manufacture of the books in any one lot.

5.6 Type of cover

The cover of a book shall be of the appropriate type given in Table 4, and the cover shall comply with the requirements of 4.4.1 or 4.4.2, as relevant.

5.7 Ruling

5.7.1 General

Ruling shall comply with the following requirements:

- a) Ruling shall be of the appropriate type given in Table 4 and, except in the case of drawing, graph and music books, shall be as specified by the purchaser (see A.1 (e) of Annex A).
- b) Ruling shall be at right angles to the bound edge of the book, except that, in shorthand notebooks, it shall be parallel to the bound edge. In the case of quad ruling, the two major components of the ruling shall be at right angles and parallel, respectively, to the bound edge.
- c) Ruling for writing purposes shall, in all cases, be limited to those pages that consist of writing paper.
- d) Ruling shall be sharp and shall not feather, and shall not exhibit bleed-through or show-through.
- e) In the case of accountancy books, there shall be a clear distinction in appearance between regular and bold ruling of the horizontal and vertical ruling, where applicable and as reflected in [Figures 1 to 7 (including Figures 1 (a), 2(a), 3(a) and 4(a))] Where horizontal ruling of the same type is present on both sides of a leaf, the ruling the two sides shall register.
- f) Except in music books (see 6.7), the colour of ruling for writing purposes shall be blue or green, or of a blue-green shade.

Dimensions in millimetres

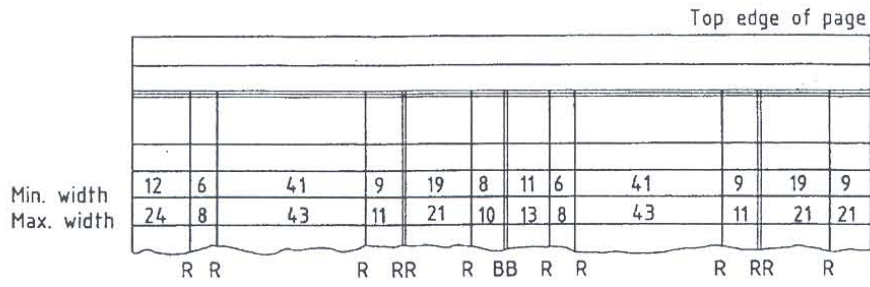


Figure 1 — Double-column ledger

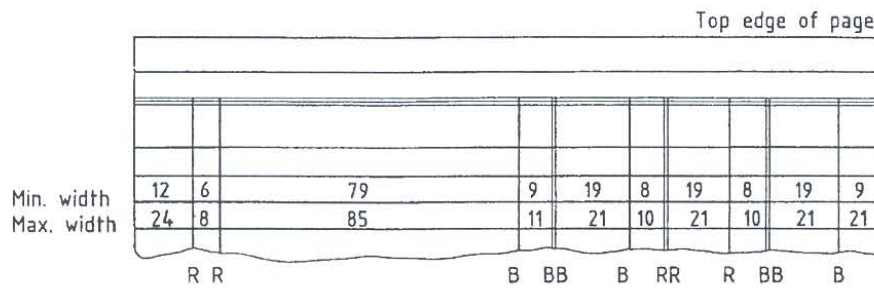


Figure 2 — Treble-column cash book

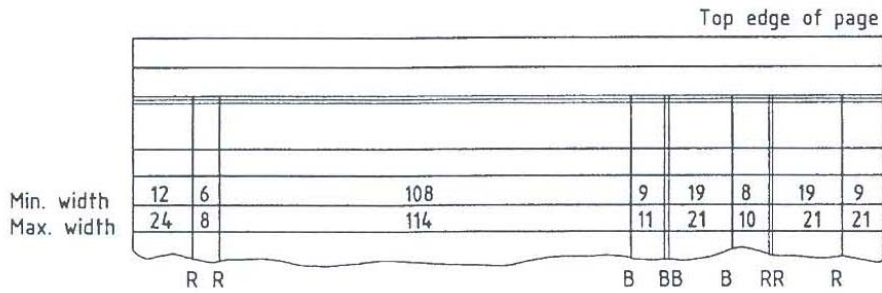


Figure 3 — Journal

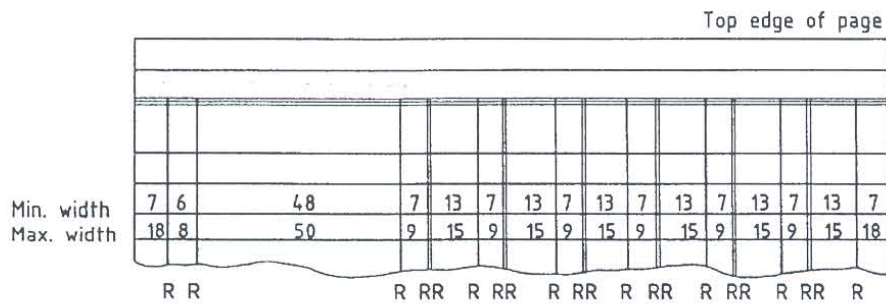


Figure 4 — Six column analysis

Dimensions in millimetres

Top edge of page

Min. width	12	6	41	9	19	8	11	6	41	9	19	9
Max. width	24	8	43	11	21	10	13	8	43	11	21	21

Figure 1 (a) — Double-column ledger

Top edge of page

Min. width	12	6	79	9	19	8	19	8	19	9		
Max. width	24	8	85	11	21	10	21	10	21	21		

Figure 2 (a) — Treble-column cash book

Top edge of page

Min. width	12	6	108	9	19	8	19	9				
Max. width	24	8	114	11	21	10	21	21				

Figure 3 (a) — Journal

Top edge of page

Min. width	7	6	48	7	13	7	13	7	13	7	13	7	13	7	13	7
Max. width	18	8	50	9	15	9	15	9	15	9	15	9	15	9	15	18

Figure 4 (a) — Six column analysis

Dimensions in millimetres

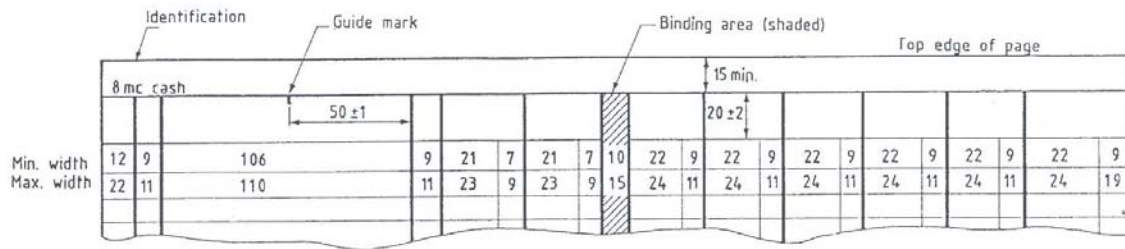
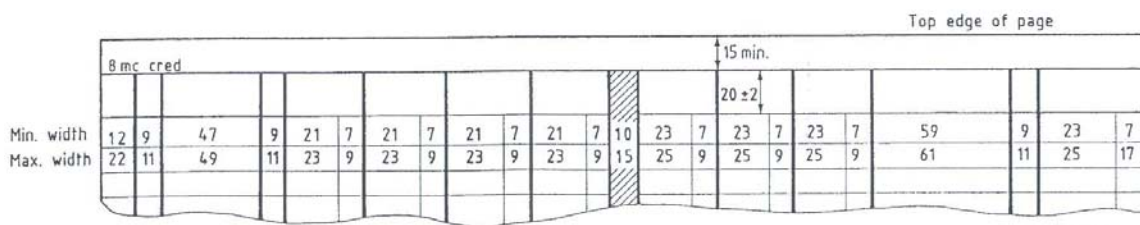


Figure 5 — Eight-column cash journal

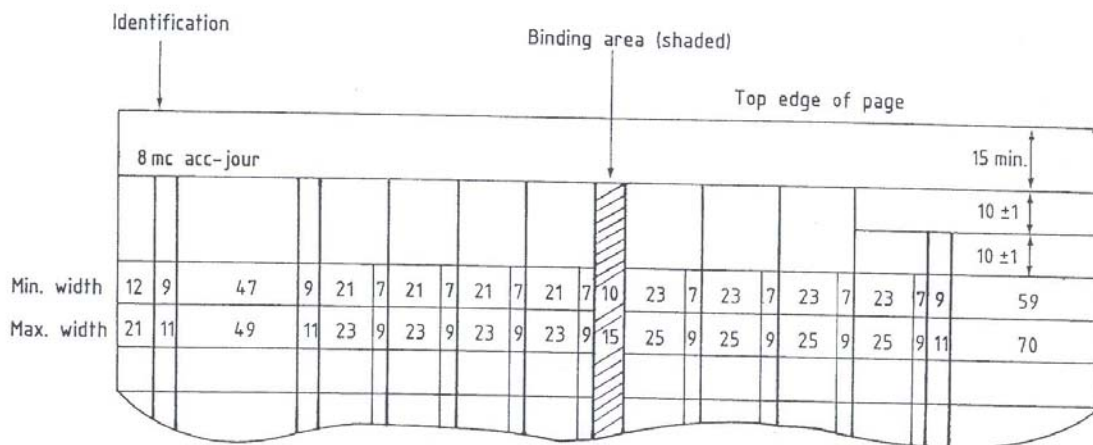
Dimensions in millimetres



NOTE Colour of vertical ruling as for horizontal ruling, that is, as specified in 5.7.1 (f)

Figure 6 — Eight-column creditor's journal

All vertical lines are bold, except that columns shall be light.



NOTE Colour of vertical ruling as for horizontal ruling

Figure 7 — Eight-column accounting journal

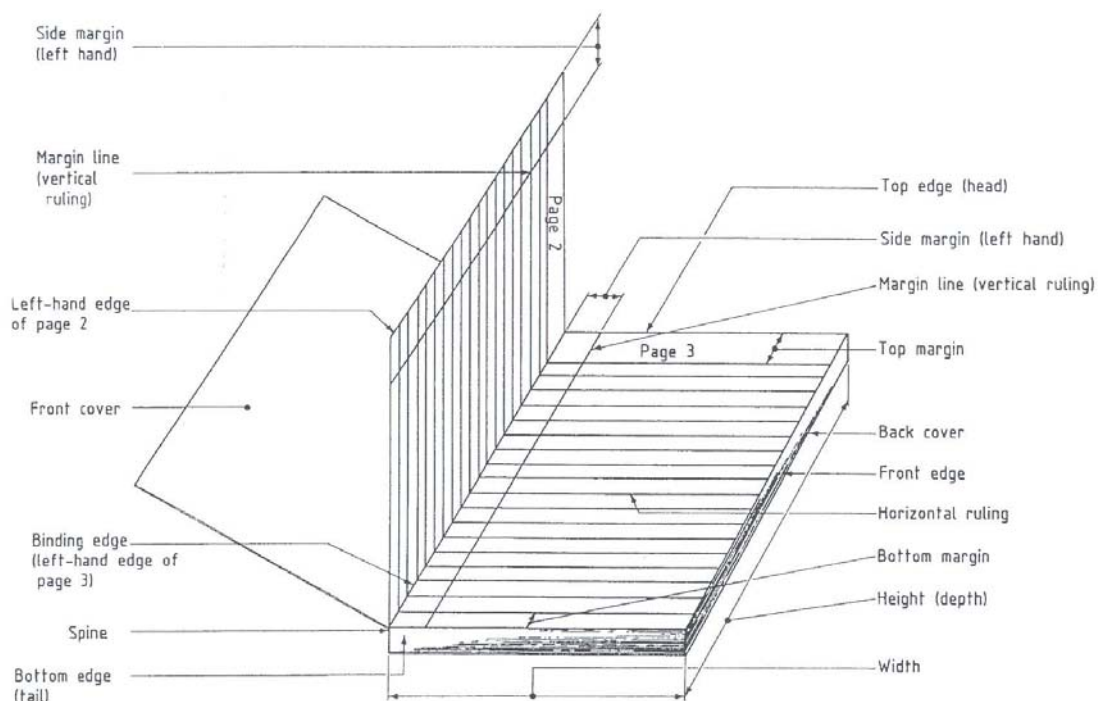


Figure 7 — Nomenclature relevant to books covered by the specification (Book in normal position of usage)

5.7.2 Feint, Irish, quad and wide ruling

The individual and average spacings of feint, Irish, quad and wide ruling, determined in accordance with 9.3.4.2, shall conform to the appropriate values given in Table 5.

Table 5 — Spacing of ruling

Dimensions in millimetres

Type of ruling	Nominal spacing	Actual spacing	Calculated average spacing between adjacent lines
Wide	17.0	17.0 ± 0.5	17.0 ± 0.5
Feint	8.5	8.5 ± 0.5	8.5 ± 0.3
Quad ¹⁾	7.0	7.0 ± 0.5	7.0 ± 0.2
Irish	5.0	5.0 ± 0.5	5.0 ± 0.2

¹⁾ Commonly called "quadruling"

5.7.3 Top and bottom margins

Except in the case of accountancy books and accountancy sheets, feint, Irish and wide ruling and the horizontal component of quad ruling shall be so positioned as to leave an unruled top margin of at least 16 mm and at most 22 mm. Ruling shall extend to the bottom of the page and the depth of the bottom margin shall not exceed the greater of 8 mm and 1.5 times the nominal spacing of the appropriate ruling, except that, in the case of wide ruling, the depth shall not exceed 17 mm.

5.7.4 Side margins

5.7.4.1 Left hand

A vertical line that marks a left-hand margin shall be parallel to the left-hand edge of the page (see Figure 8) and shall extend over the entire height of the page. The distance between a margin line and the left-hand edge of a page shall be at least 12 mm and at most 20 mm, except that, in soft-cover books that contain more than 72 pages, this distance shall be at least 12 mm and at most 30 mm. The colour of a margin line shall be red or shall be the same colour as that of the ruling. If the colour of the margin line is the same as that of the ruling, the margin line shall be ruled bold. There shall be a clear distinction in appearance between regular and bold ruling. In the case of quad ruling, the margin line shall replace a vertical line and shall be within 1 mm of the position of the replaced line.

5.7.4.2 Right hand

The use of right-hand margin lines shall be limited to books for external examinations (see Table 4 and 6.10.2). Right-hand margin lines shall comply with the requirements for left-hand margin lines, except that the distance shall be measured between the margin line and the right-hand edge of the page.

5.8 Binding

5.8.1 General

The free edges of the covers of all books, except books for external examinations, shall have been trimmed flush, to within 1 mm, with the pages, and the books shall be rectangular. Books for external examinations shall have been trimmed likewise except for the back cover, which shall have been extended and folded back as described in 6.10.2.

5.8.2 Soft-cover books

5.8.2.1 Stapled books

5.8.2.1.1 Format A4 and A4L books that contain at least 72 pages

Format A4 books shall be bound with at least three staples along one longer edge. Format A4L books shall be bound with at least two staples along one shorter edge. The staples shall be positioned as follows:

- a) the outer staples shall be at least 25 mm and at most 60 mm from the top and bottom edges respectively, of the book; and
- b) the inner staple or staples (if any) shall be spaced between the two outer staples in an acceptably uniform manner.

5.8.2.1.2 Format A4 and A4L books that contain fewer than 72 pages

The books shall be bound as specified in 5.8.2.1.1, except that the inner staple or staples may be left out.

5.8.2.1.3 Format A5 and A5L books

The books shall be bound, along one longer edge in the case of A5 books and along one shorter edge in the case of A5L books, with at least two staples. The staples shall be positioned as follows:

- a) the outer staples shall be at least 25 mm and at most 40 mm from the top and bottom edges of the book respectively; and
- b) any additional staple or staples shall be spaced between the outer staples in an acceptably uniform way.

5.8.2.2 Wire-bound books

Books of format A5T (that is, shorthand notebooks) shall be bound with wire. There shall be a row of at least 12 uniformly spaced holes so clean-punched through the cover and pages of the book along its top (shorter) edge that there is a clearance of at least 2 mm between that edge and the edges of the holes. Wire, coiled or otherwise, shall have been so threaded through the holes as to enable the book to be opened flat through 360°.

5.8.3 Hard-cover books

5.8.3.1 General

All hard-cover books shall be quarter bound, of robust construction, and shall comply with the requirements for the attachment of cover boards given in 5.8.3.2.3.

5.8.3.2 Methods of binding

5.8.3.2.1 Section sewing

Books constructed by section sewing shall contain the appropriate number of sections, each section consisting of at most 16 fly sheets appropriately folded and assembled by sewing down the fold. The top and bottom stitches shall be at most 40 mm from the top and bottom edges, respectively, of the book.

5.8.3.2.2 Adhesive binding

The leaves of a book constructed by means of adhesive binding shall consist of single sheets whose bound edges are flush, and so secured together by adhesive, that each sheet is held firmly in position.

5.8.3.2.3 Attachment of cover boards

Cover boards shall be attached to the spine of the bound pages in accordance with sound commercial practice, and shall be attached to one another with the aid of outer, and preferably also inner, spine-reinforcing materials. The width of the gap between a cover board and the spine shall not exceed 8 mm. Spine-reinforcing materials shall overlap the relevant edges of the cover boards by at least 10 mm, and shall be securely attached to the boards over the entire area of each overlap. Inner spine reinforcing material, when used, and outer spine-reinforcing material used without inner spine reinforcing material, shall be securely attached to the spine of the bound sheets.

5.8.3.3 Constructional requirements

5.8.3.3.1 Books that contain more than 192 pages

Partly indexed books shall be constructed by means of section sewing as specified in 5.8.3.2.1. At least three approximately uniformly spaced binding tapes shall be either sewn or pasted onto the spine of the sewn sections and securely pasted onto both cover-boards over a distance of at least 20 mm. The books shall have hook-on end-sheets.

5.8.3.3.2 Books that contain at most 192 pages

Hard-cover books that contain at most 192 pages shall be constructed, at the discretion of the manufacturer, by means of section sewing (see 5.8.3.2.1) or adhesive binding (see 5.8.3.2.2) along one longer edge.

5.8.3.4 Performance test requirements

When a hard-cover book is tested in accordance with

- a) 9.5.4, the book shall show no sign of wear that could impair its serviceability, or show little or no sign of the pages having been torn or become detached from the book; and
- b) b). 9.5.5, there shall be little or no sign of any of the components having become detached from one another, or having suffered significant damage.

5.9 Printing

When printing is required, it shall be limited to the covers of a book and, in the case of books for external examinations, it shall be further limited to the outside of the front cover and the inside surface of the extension of the back cover (see 6.10.2). In all cases, printing shall be as specified by the purchaser (see A.1 (f) of Annex A).

6 Specific requirements for books

6.1 General-exercise and scribbling books

6.1.1 General

The ruling of general-exercise and scribbling books shall be as described in 5.7.1.

6.1.2 Ruling on alternate pages

When ruling on alternate pages is required, the first page (in the case of hard-cover books, the first one that is not an end-leaf) shall be ruled, and thereafter, one of each pair of facing pages shall be ruled and the other unruled, except that the two centre pages in a soft-cover book shall both be ruled or both unruled, at the discretion of the manufacturer.

6.2 Accountancy books

Accountancy books shall have a double-column ledger, treble-column cash journal, six-column analysis, eight-column cash journal, eight-column creditor's journal, or eight-column accounting journal type ruling, as required in terms of 5.7.1, and the requirements for margins given in 5.7.3 and 5.7.4 shall not apply. The horizontal components of accountancy ruling shall be faint ruling, and shall allow for at least 29 entries on each page. The horizontal ruling at the head of each page shall be as shown in, or similar to that shown, in Figures 1 and 1(a), 2 and 2(a), 3 and 3(a), 4 and 4(a), 5, 6 or 7, as appropriate, and the spacing of these lines shall, except where otherwise indicated, be at the discretion of the manufacturer. The spacing and colours of the vertical components of accountancy ruling shall be as specified in Figures 1 and 1(a), 2 and 2(a), 3 and 3(a), 4 and 4(a), 5, 6 or 7, as applicable.

6.3 Graph books

6.3.1 Types of ruling on leaves

Graph books shall consist of leaves so ruled that the first page is ruled for writing purposes. Thereafter, one page of each pair of facing pages shall be ruled for writing purposes and the other page for graphs, except that the two centre pages may, at the discretion of the manufacturer, be ruled for graphs only.

6.3.2 Ruling of pages for graphs

The pages for graphs shall be ruled in nominally 2.0 mm squares, and shall have unruled margins at all four edges. The horizontal rows shall each contain 80 squares, and the vertical columns, 130 squares. Every fifth and tenth line in both horizontal and vertical directions shall be ruled bolder than the rest, and every tenth line shall be bolder than every fifth. The distance between the centre-lines of any pair of adjacent ruled lines shall be 2.0 mm \pm 0.1 mm. In addition, the average distance between adjacent lines shall be 2.00 mm \pm 0.06 mm.

The width of the margin adjacent to the binding edge shall range from 20 mm to 30 mm, and that of the margins at the top, bottom and remaining side, shall each be at least 15 mm.

6.3.3 Ruling of pages for writing

The pages reserved for writing shall be ruled feint and the ruling shall incorporate a left-hand margin line (see 5.7.4.1).

6.4 Drawing books

6.4.1 With interleaving paper

The two centre leaves shall be of interleaving paper, and from front and back to the centre, leaves of drawing paper and interleaving paper shall alternate.

6.4.2 Without interleaving paper

Books shall contain drawing paper only.

6.5 Shorthand notebooks

The writing paper of shorthand notebooks shall be ruled feint on both sides. When a dividing line is required, it shall be ruled at right angles to the feint ruling (see 5.7.1) and shall be within 3 mm of the imaginary centre-line (see 9.3.4.8.2) of the page.

6.6 Biology and nature study books

In biology and nature study books, sheets of ruled writing paper and unruled drawing paper shall alternate throughout. Ruling shall be as required in terms of 5.7.1. The first leaf (or in the case of hard cover books, the first one that is not an end-leaf) shall be of ruled writing paper. The two centre leaves in a soft-cover book shall be of drawing paper. In the case of section-sewn hard-cover books, the two centre leaves of alternate sections shall be of writing paper and those of the remaining sections shall be of drawing paper.

6.7 Music books

The writing paper of music books shall be ruled, at right angles to the binding edge, in staves, each formed by five lines spaced $2.2 \text{ mm} \pm 0.1 \text{ mm}$ apart. The distance between the first line of the first stave and the upper edge of a page shall be at least 20 mm and at most 30 mm, and the distance between the last line of the lowest stave and the lower edge of the page shall be at least 15 mm and at most 25 mm. Books of format A4 shall contain 12 staves per page, and books of format A5L shall contain six staves per page. In both cases, the distance between consecutive staves shall be uniform to within 1 mm. Unruled left-hand and right-hand margins shall be provided on each page, and their widths, determined in accordance with 9.3.4.7.1 (b), shall be at least 8 mm and at most 15 mm. The colour of the ruled lines shall be grey to black.

6.8 Theme books

In theme books, sheets of writing paper (ruled on both sides), interleaving paper and drawing paper shall be interleaved with one another in that order, the first and last leaves of a book being of writing paper. The ruling shall be as required in terms of 5.7.1.

6.9 Mapping books

When border lines are required in terms of 5.7.1, each edge of each page shall have a border line. Each border line shall consist of either one bold line or two closely spaced lines, ruled parallel to, and at least 15 mm and at most 20 mm from, the adjacent edge of the paper.

6.10 Examination answer books

6.10.1 Internal examination books

6.10.1.1 Perforations

Each leaf shall be perforated for tear-out purposes. The line of perforations shall be parallel to, and located at most 11 mm from, the binding edge. Perforation cuts shall have penetrated the paper completely, shall be uniform over the entire length of the perforation line and, when tested in accordance with 9.5.11, shall be such as to permit a clean tear along the line of perforations.

6.10.1.2 Ruling

Each page shall have faint ruling, and shall be with or without a left-hand margin line (see 5.7.4.1) as specified by the purchaser (see A.1 (e) of annex A).

6.10.2 External examination books

The ruling shall be of one of the following types, as specified by the purchaser (see A.1 (e) of annex A):

- a) faint with left-hand and right-hand margin lines, and on both sides of each leaf or on the right-hand pages only;
- b) double-column ledger;
- c) treble-column cash;
- d) journal;
- e) six-column analysis; eight-column cash journal;
- f) eight-column creditor's journal; or
- g) eight-column accounting journal.

In the cases of (b), (c), (d), (e), (f), (g) and (h) above, the ruling shall be on both sides of each leaf and shall be as specified in 6.2. The back cover shall extend beyond the front edge of the book for a distance in the range 85 mm to 95 mm. The extension shall be folded back into the book between the last page and the back cover, along a crease line that is parallel to, and within 3 mm of, the front edge of the book (see Figure 8). The top and bottom edges of the cover shall have been trimmed flush with the writing paper to within 1 mm, and the front edge of the front cover shall have been trimmed flush with the writing paper to within 3 mm. The colour of the cover material shall be as specified by the purchaser (see A.1 (g) of Annex A) in terms of 4.4.1.

6.11 Index books

6.11.1 Fully indexed

In books that are fully indexed, the pages shall be divided into 26 sets, each covering a different letter of the alphabet, given in the correct sequence, with the set covering the letter A uppermost. The letters shall be given in San serif capitals of height at least 5 mm, on the first page only of each set, and shall be so positioned that they are not obscured by the pages of the preceding sets. All the letters shall be visible when the front cover of the book is opened. This shall be achieved by means of cut-outs, of width in the range 10 mm to 14 mm, along the front edges of the leaves of the book. In the case of 96-page books, the sets for the letters I, Q, U, X, Y and Z shall each consist of two pages (that is, one leaf), and the sets for the other letters shall each consist of at least four pages (two leaves). In the case of 192-page books, the sets for the letters Q, U, X, Y and Z shall each consist of four pages, and the sets for the other letters shall each consist of at least eight pages. The ruling shall be as required in terms of 5.7.1.

6.11.2 Partly indexed

In partly indexed books, letters of the alphabet shall be printed, two per leaf, with one letter positioned above the other, and with each subsequent pair of letters printed on subsequent leaves. Unless otherwise specified by the purchaser (see A.1 (h) of Annex A), all letters of the alphabet shall be included. The type, position, height and visibility of letters shall comply with the requirements given in 6.11.1. Leaves not indexed shall not have cut-outs. The ruling of all pages shall be as required in terms of 5.7.1 and, unless otherwise specified by the purchaser (see A.1 (h) of Annex A), all pages without cut-outs shall be consecutively numbered (from 1 onwards) in the top left-hand or right-hand corner, away from the spine, as applicable. The numbers shall be of height at least 4 mm.

7 Specific requirements for ruled sheets of paper

7.1 Type

Ruled sheets shall be of one of the following types, as specified by the purchaser (see A.2 (a) of annex A):

- a) general purpose (with appropriate ruling);
- b) accountancy; or
- c) graph.

7.2 Material

7.2.1 Minimum requirements

The ruled sheets shall be of Grade B or Grade C writing paper (see 4.1 and Table 1), as specified by the purchaser (see A.2 (a) of Annex A).

7.2.2 Allowance of better than minimum requirements

Manufacturers may, at their discretion, use chemical paper where mechanical paper is required, and may use a higher grammage than the minimum grammage required, provided that only one grade and one grammage are used in the manufacture of the sheets in any one lot.

7.3 Dimensions

Ruled sheets shall be of format A4 or A4 fly (that is, A3L folded to A4), as specified by the purchaser (see A.2 (c) of Annex A), and their dimensions shall comply with the relevant values given in Table 3, except that the eight-column accounting journal, eight-column cash journal, and eight-column creditor's journal shall be of format A4 fly.

7.4 Collating of fly sheets

Size A3L sheets shall be collated into aggregates of eight sheets each, and each aggregate shall be folded to size A4 fly.

7.5 Ruling

7.5.1 Ruling shall be on both sides of the paper and the type of ruling shall be one of the types described in 7.5.2 to 7.5.4.

7.5.2 The ruling for general purpose sheets shall be feint, Irish, wide, or quad, as described in 5.7.2, and with or without a left-hand margin line (see 5.7.4.1), as specified in both cases by the purchaser (see A.2 (c) of Annex A).

7.5.3 The ruling for accountancy sheets shall be double-column ledger, treble-column cash book, journal, six-column analysis, eight-column cash journal, eight-column creditor's journal or eight-column accounting journal, as described in 6.2 and as specified by the purchaser (see A.2 (a) of Annex A).

7.5.4 Graph ruling for graph sheets shall be as specified in 6.3.2 on one side, and the reverse side shall be ruled feint and shall have a left-hand margin line as in 6.3.3. The width of the filing margin (longer edge, left-hand side) on the side ruled for graphs shall be at least 30 mm, and that of the remaining margins on that side shall each be at least 15 mm.

8 Sampling and compliance with the specification

8.1 Sampling

8.1.1 General

The sampling procedure below shall be applied when determining whether a lot complies with the relevant requirements of the specification. The samples so taken shall be deemed to represent the lot for the respective purposes.

8.1.2 Sample for inspection of packing and marking

8.1.2.1 Corrugated board boxes

If the packets are supplied in corrugated board boxes, from the lot draw at random the number of units (that is, boxes) given in Table 1 of US ISO 186, relative to the appropriate lot size in the same table. After checking for compliance with the relevant requirements of Clause 7, from each box so drawn, take one packet.

8.1.2.2 Packets

In the case of packets of books or packets of paper not supplied in boxes, after checking for compliance with the appropriate requirements of clause 7 (other than for the number of sheets per packet), from the lot draw at random the number of units (that is, packets) given in Table 1 of US ISO 186, relative to the appropriate lot size given in the same table.

8.1.3 Sample for inspection of books and packets of paper

8.1.3.1 Books

Obtain a sample of at least 20 books by taking at random from each packet drawn in accordance with 8.1.2.1 or 8.1.2.2 (as relevant), an approximately equal number of books.

8.1.3.2 Packets of paper

From the packets of paper drawn in accordance with 8.1.2.1 or 8.1.2.2 (as relevant), after using the procedure given in 9.4.1 to check for compliance with the requirement for the number of sheets per packet, obtain a sample of 20 sheets by taking at random an approximately equal number of sheets from each packet.

8.1.4 Sample for testing

8.1.4.1 Books

After inspection in accordance with 9.3 of the books drawn in accordance with 8.1.3.1, take from them at random,

- a) in the case of hard-cover books, 10 books for the tests given in 9.5.4 and 9.5.5.
- b) in the case of soft-cover books, the covers from at least 10 books for the test given in 9.5.3.
- c) in all cases, from at least 10 books, as many pages of writing, drawing and interleaving paper, as relevant, and covers, as are required for the remainder of the applicable tests given in 9.5.

8.1.4.2 Sheets

After inspection in accordance with 9.4 of the sheets drawn in accordance with 8.1.3.2, take from them at random as many sheets as are required for the applicable tests given in 9.5.

8.2 Compliance with the specification

8.2.1 Books

The lot shall be deemed to comply with the relevant requirements of the specification if,

- a) on inspection, as described in 9.1 and 9.3.1, of each unit in the samples drawn in accordance with 8.1.2 and 8.1.3, no defective is found.
- b) on determination of the number of pages, as described in 9.3.2, and on measurement, as described in 9.3.3, 9.3.4.6, 9.3.4.7.2, and 9.3.5 to 9.3.11, as relevant, of each book in the sample drawn in accordance with 8.1.3.1, no defective is found.
- c) on measurement, as described in 9.3.4.1 to 9.3.4.5, as relevant, of each book in the sample drawn in accordance with 8.1.4.1, at most one defective is found in respect of anyone relevant dimension.
- d) on testing, as described in 9.5.1 to 9.5.10, as relevant, of the samples drawn in accordance with 8.1.4.1, no defective is found.

8.2.2 Sheets

The lot shall be deemed to comply with the relevant requirements of the specification if,

- a) on inspection, as described in 9.1, 9.4.1 and 9.4.2, of each unit in the samples drawn in accordance with 8.1.2 and 8.1.3, no defective is found.
- b) on measurement, as described in 9.4.3, of each sheet in the sample drawn in accordance with 8.1.2.2, no defective is found.
- c) on measurement, as described in 9.4.4, of the sample drawn in accordance with 8.1.3.2, at most one defective is found in respect of any one relevant dimension.
- d) on testing, as described in 9.5.1 and 9.5.7 to 9.5.10 of the sample drawn in accordance with 8.1.4.2, no defective is found.

9 Inspection, conditioning and methods of test

9.1 Inspection of packing and marking

Inspect all the packets and, when relevant, all the corrugated board boxes taken in accordance with 8.1.2, for compliance with the requirements of 7.1, 7.2 and 7.3, as applicable.

9.2 Conditioning

Condition and test the test pieces in an atmosphere maintained in accordance with US ISO 187 at a temperature of $23^{\circ}\text{C} \pm 1^{\circ}\text{C}$ and at a relative humidity of $(50 \pm 2)\%$.

9.3 Inspection of books

9.3.1 Examination

Visually examine each book taken in accordance with 8.1.3.1 for compliance with those relevant requirements of Clauses 4, 5 and 6, compliance with which is not assessed by the inspections and tests given in 9.3.2 to 9.3.11 and 9.5.

9.3.2 Number of pages

Count the number of pages (when relevant, of each type separately) in at least 10 books taken at random from the sample drawn in accordance with 8.1.3.1, and report the average for each type of page.

9.3.3 Dimensions of books

9.3.3.1 General

Measure, to the nearest 1 mm, the width and height of each of at least 10 books taken at random from the sample drawn in accordance with 8.1.3.1. Take the measurements as described in 9.3.3.2 to 9.3.3.4, as relevant, and report the average for each dimension.

9.3.3.2 Wire-bound books

Open the book flat at any page chosen at random. Take the distance between the left-hand and right-hand edges of the page as the width of the book, and take the distance between the top (bound) and bottom edges of the page as the height of the book.

9.3.3.3 External examination books

Disregard or discard the cover, and measure, as in 9.3.3.4.1 and 9.3.3.4.2 respectively, the height and the width of the stapled writing paper only.

9.3.3.4 All other books

9.3.3.4.1 Take the distance between the top and bottom edges of the book as the height.

9.3.3.4.2 With the spine of the book placed squarely on a flat horizontal surface and the book held vertically, take the distance between the flat surface and the front edge of the book as its width.

9.3.4 Ruling

9.3.4.1 General

Measure, using the appropriate of the procedures given in 9.3.4.2 to 9.3.4.8, the ruling of at least five books taken at random from the sample drawn in accordance with 8.1.3.1, and report the individual results, except where otherwise indicated.

9.3.4.2 Ruling of a type as specified in Table 5

9.3.4.2.1 All types of ruling

Proceed as follows:

- a) on any page in each book, take, to the nearest 0.25 mm, five measurements of the distance between the centres of any six consecutive horizontal lines; and
- b) on any page in each book, measure, to the nearest 1 mm, the distance between the centres of the top and bottom lines. For each book, calculate and report to the nearest 0.1 mm, the average distance between consecutive horizontal lines.

9.3.4.2.2 Additional requirements for quad ruling

Proceed as follows:

- a) determine and report the distance between the centres of any six consecutive vertical lines, as described in 9.3.4.2.1 (a) for horizontal lines; and
- b) determine and report for each book the average distance between the consecutive vertical lines, as described in 9.3.4.2.1 (b) for horizontal lines.

9.3.4.3 Ruling of accountancy books

9.3.4.3.1 Vertical component

On any two pages in each book, measure, to the nearest 0.5 mm, the distance between the centres of all adjacent pairs (other than closely spaced double lines) of vertical lines.

9.3.4.3.2 Horizontal component

Use the procedures given in 9.3.4.2.1 (a) and (b) to measure and report the individual and average distances between the horizontal lines used for making entries.

9.3.4.4 Ruling of graph books

9.3.4.4.1 Pages ruled for writing

Proceed as in 9.3.4.2.1.

9.3.4.4.2 Pages ruled for graphs

Proceed as follows:

- a) on any page in each book, take, to the nearest 0.1 mm, five measurements (both horizontally and vertically) of the distance between the centres of any adjacent pairs of lines; and

- b) on any page in each book, measure (both horizontally and vertically), to the nearest 1 mm, the distance between the centres of the two outermost lines. For each book calculate and report, to the nearest 0.01 mm, the average distance between consecutive lines (both horizontal and vertical).

9.3.4.5 Ruling of biology and nature study books, theme books, examination answer books and index books

Proceed as in 9.3.4.2.1.

9.3.4.6 Ruling of music books

Proceed as follows:

- a) on any two pages in each book, measure, to the nearest 0.1 mm, the distance between the centres of adjacent lines of any one stave.
- b) on any page in each book, measure, to the nearest 0.5 mm the distance between the centres of the two lines closest to each other in every adjacent pair of staves.

9.3.4.7 Margins

9.3.4.7.1 Side margins

Proceed as follows:

- a) except in the case of side margins of music books, on any two pages in each book, measure, to the nearest 1 mm, the distance between the centre of each side-margin line and the adjacent edge of the page, or in the case of margins adjacent to the binding edge, the folded edge of the previous or the following page, as applicable;
- b) in the case of side margins of music books, draw tangents to the left-hand and right-hand ends of the staves and then measure the width of the margins as above; and
- c) in all cases, report the average value for left-hand and right-hand margins, as relevant.

9.3.4.7.2 Top and bottom margins

On any two pages in each book, measure, to the nearest 1 mm, the distance between the centre of the top and bottom lines and the top and bottom edges of the page, respectively. Report the average value for each margin separately.

9.3.4.8 Shorthand notebooks

9.3.4.8.1 Feint ruling

Proceed as in 9.3.4.2.1.

9.3.4.8.2 Dividing line

On any two pages in each book, measure, to the nearest 1 mm, the distances between the dividing line and the left-hand and right-hand edges of the book. For each of the pages, take half of the difference between the two measurements as the distance between the imaginary centre-line and the dividing line. Calculate and report the average of these distances.

9.3.5 Staple binding

9.3.5.1 Placement and dimensions, excluding diameter, of staples

In at least 10 books taken at random from the sample drawn in accordance with 8.1.3.1, measure, to the nearest 1 mm,

- a) the distances between the top and bottom edges of the book and the adjacent end of the staples closest to the top and bottom respectively.
- b) the length of crown of all the staples in the books.
- c) the length of the clinched ends of all the staples.

Report the average value of the distances described in (a) above, separately for each set of staples in a particular position, the average crown length of all the staples in the 10 books and the average value for each individual set of clinched ends in a particular position, that is, for each set of staples in a particular position there shall be one average value for each of the two clinched end positions.

9.3.5.2 Diameter of staples

Measure, to the nearest 0.01 mm, the diameter of at least one staple in each book and report the average value.

9.3.6 Binding of hard-cover books

In at least 10 books taken at random from the sample drawn in accordance with 8.1.3.1, measure, to the nearest 1 mm, the width of the gap between each cover board and the spine, and the overlap between the spine-reinforcing material and cover boards. Report the average value in each case.

9.3.7 Binding of wire-bound books (shorthand notebooks)

9.3.7.1 General

Take at least 10 books at random from the sample drawn in accordance with 8.1.3.1, and proceed as prescribed in 9.3.7.2 and 9.3.7.3.

9.3.7.2 Binding holes

Measure, to the nearest 1 mm, the distances between the binding edge of each of the two covers, and of each of any two leaves, to the closest point on the edges of any two binding holes in these covers or leaves. Report the average for all the covers measured, and the average for all the leaves measured.

9.3.7.3 Diameter of binding wire

Measure, to the nearest 0.01 mm, the diameter of the binding wire of each book. Report the average.

9.3.8 Position of perforations in internal examination books

On any two pages in each of at least five books taken at random from the books drawn in accordance with 8.1.3.1, measure, to the nearest 1 mm, the distance between the centre of the line of perforations and the adjacent folded edge of the same page or of the previous or following pages, as relevant, and report the average value.

9.3.9 Size of letters and cut-outs in index books

In at least five books taken at random from the sample drawn in accordance with 8.1.3.1, measure, to the nearest 0.5 mm, the height of at least four letters selected at random and report the average value. In the same books, measure, to the nearest 1 mm, the distance between the recessed edge and front edge of each leaf, and report the average value.

9.3.10 Length of extension of back cover of external examination books

In at least 10 books taken at random from the sample drawn in accordance with 8.1.3.1, measure, to the nearest 1 mm, the distance from the crease line to the edge of the extension, and report the average value.

9.3.11 Flushness of covers

On each of the three free edges of the covers of at least five books taken at random from the sample drawn in accordance with 8.1.3.1, measure, to the nearest 1 mm, the maximum distance that the cover extends beyond the pages of the book, or vice versa. Report the average value for each individual edge.

9.4 Inspection of sheets of paper

9.4.1 Number of sheets per packet

In at least five packets, count the number of sheets or, when relevant, the number of aggregates of collated sheets. In the latter case, also count the number of fly sheets in at least two collated aggregates in each ream. Report the average value for each quantity.

9.4.2 Examination

Visually examine each sheet taken in accordance with 8.1.3.2 for compliance with the relevant requirements of 4.1 and 7.4. Report the results of the examination in respect of each requirement.

9.4.3 Dimensions of sheets

On at least 10 sheets taken at random from the sample drawn in accordance with 8.1.3.2, measure, to the nearest 1 mm, the length and width of the sheets in the case of A4 sheets or, in the case of A4 fly sheets, measure the folded left-hand and right-hand leaves of every fly sheet, and report the average for each dimension

9.4.4 Ruling

Measure the ruling on both sides of at least five sheets taken at random from the sample drawn in accordance with 8.1.3.2. Use the procedures applicable to the specific type of ruling as given in 9.3.4.

9.5 Testing of materials and performance of books

9.5.1 Grammage

Use the method given in US ISO 536 to determine the average grammage of 20 test pieces, each of area at least 0.010 m², prepared from the sample drawn in accordance with 8.1.4.1 (c).

9.5.2 Apparent bulk density of cover board

Use the method given in US ISO 534 by using an instrument that exerts 100 kPa of anvil pressure, to determine the average value of the apparent bulk density of 20 test pieces prepared from the sample drawn in accordance with 8.1.4.1 (a).

9.5.3 Resistance to internal tearing

Use the method given in US ISO 1974 and the single-tear tester, to determine the average resistance to internal tearing of 10 test specimens prepared from the sample drawn in accordance with 8.1.4.1 (b).

9.5.4 Quality of sewing threads, spine-reinforcing materials, binding tapes and adhesives

9.5.4.1 Apparatus

A machine that consists essentially of the following:

- a) means whereby the front cover of a hard-cover book can be so secured that the book can be opened and closed through any desired angle up to 180° , at a rate of (40 ± 4) cycles per minute, starting from an angle of $\pm 10^\circ$ to the vertical, while the rest of the book is lying on a horizontal rectangular platform with the spine of the book parallel to and close to one edge of the platform (the spine-edge);
- b) two low-friction, low-inertia pulleys, with their axes coinciding, and parallel to the spine-edge of the platform, so positioned near to the edge opposite to the spine-edge, that the plane of the platform is tangential to the base of the grooves at the top of the pulleys;
- c) two mass pieces. each of a mass of 100 g; and
- d) a suitable horizontal support for the mass pieces.

9.5.4.2 Test specimens

Use the books taken in accordance with 8.1.4.1 (a).

9.5.4.3 Procedure

9.5.4.3.1 Section-sewn books (see 5.8.3.2.1, 5.8.3.3.1 and 5.8.3.3.2)

Proceed as follows:

- a) secure the book on the apparatus [see 9.5.4.1 (a)] and so adjust the mechanism that the maximum angle to which the book will open is 180° ;
- b) adjust the front cover to within $\pm 10^\circ$ of the 90° open position and attach the first leaf of the centre pages of the first section to the front cover by means of a single piece of adhesive tape applied to the middle of the front edges of the leaf and cover. By using suitable lengths of string and adhesive tape, so attach the two mass pieces to the second leaf of the centre pages of the first section that, when the strings are passed over the pulleys, the masspieces are just in contact with the horizontal support. The strings shall be positioned to align with the midpoints of the stitches closest to the top and bottom edges respectively;
- c) start the machine and, after 1 000 cycles, stop it and examine the book for compliance with the requirements of 4.6 and 5.8.3.4(a), paying particular attention to the areas where the thread passes through the leaves; and
- d) repeat (b) and (c) above on the centre pages of any one section (chosen at random) in each of the remaining test specimens

9.5.4.3.2 Adhesive-bound books (see 5.8.3.2.2)

Use the procedure given in 9.5.4.3.1, but with anyone of the first three leaves and one other leaf (both chosen at random) attached to the front cover. Check for cracking or splitting of the spine, especially between leaves.

9.5.5 Quality of binding

9.5.5.1 Apparatus

A pentagonal drum that has a depth of 50 mm and that is rotated, at a rate of 12 r.p.m. \pm 1 r.p.m. about a horizontal axis through its centre of gravity and parallel to its depth. The internal surfaces of the drum are smooth, the internal length of each side of the drum is 600 mm \pm 20 mm, and the angles between the consecutive sides are 90°, 132°, 90°, 114° and 114° respectively, each subject to a tolerance of \pm 20.

9.5.5.2 Test specimens

Use the same books as were used in the test given in 9.5.4.

9.5.5.3 Procedure

Insert the book under test into a drum and rotate the drum. After 25 revolutions, stop the drum, remove the book and examine it for compliance with the requirements of 4.6 and 5.8.3.4 (b). Repeat the test on each of the remaining test specimens.

9.5.6 Fibre composition

Use the method given in ISO 9184-3 to determine the percentage of mechanically processed wood fibres, if any, in paper.

9.5.7 Brightness of paper

Use the method given in US ISO 2470 to determine the average brightness of 10 test pieces prepared from the sample drawn in accordance with 8.1.4, as relevant.

9.5.8 Brightness of paper after aging

Use the method given in 9.5.7 on 10 test pieces that have been exposed to xenon light for a period of 10 h.

9.5.9 Opacity of paper

Use the method given in US ISO 2471 to determine the average opacity of 10 test pieces prepared from the sample drawn in accordance with 8.1.4, as relevant.

9.5.10 Bursting strength

Use the method given in US ISO 2758 to determine the average bursting strength of 20 test pieces prepared from the sample drawn in accordance with 8.1.4, as relevant.

9.5.11 Performance of perforations in internal examination books

In at least five books taken at random from the books drawn in accordance with 8.1.3.1, test the perforations as below.

Place the book open on a flat horizontal surface. With the thumb and forefinger of the left hand adjacent to, and on the left-hand side of, any right-hand leaf in the first half of each book, and with the forefinger at the top of the leaf, press the book down on the surface. With the right hand take the right-hand end of the top of the leaf. Exert a steady pull at an angle of about 10° downwards from the top edge and tear the leaf along the line of perforations down to the thumb of the left hand. Move the hands downwards on the page to the same position relative to the end of the tear, as they were initially to the beginning of the tear, and continue the tear. Repeat this procedure until the leaf is torn through. Consider the line of perforations to be defective if there is any deviation of the line of tear from the line of perforations. Repeat the procedure on any right-hand leaf in the second half of the book. Report the number of defectives, if any.

10 Packing and marking

10.1 Packing

10.1.1 Packets

Books and ruled sheets of paper shall be suitably wrapped in packets, each containing quantities in accordance with commercial practice, or when relevant, the quantity specified by the purchaser (see A.1 (i) or A.2 (d), as applicable, of Annex A).

10.1.2 Bulk containers

When so specified by the purchaser, packets of books or packets of sheets of paper shall further be packed into acceptable corrugated containers, each containing quantities in accordance with commercial practice or, when relevant, the quantity specified by the purchaser (see A.1 (j) or A.2 (e), as applicable, of Annex A). Only nominally identical books shall be packed together in a bulk container, and only packets of nominally identical ruled sheets of paper shall be packed together in a bulk container.

10.2 Marking of packed books

10.2.1 Packets

Each packet of books shall bear the following information in legible and durable marking:

- a) the name or trade mark of the manufacturer, or both;
- b) the type of book (for example, general-exercise, scribbling books, etc.);
- c) the format of the books;
- d) the number of pages per book;
- e) the type of ruling;
- f) when relevant, whether or not ruling incorporates a margin, a border or a dividing line (as applicable);
- g) the number of books per packet; and
- h) any additional information specified by the purchaser (see A.1 (k) of Annex A).

10.2.2 Bulk containers

Each bulk container shall bear, in legible and durable marking, the information specified in 10.2.1 (a) to 10.2.1 (f), the total number of books in the container, and any additional information specified by the purchaser (see A.1 (k) of Annex A).

10.3 Marking of packets of ruled sheets of paper

10.3.1 Packets

Each packet of ruled sheets of paper shall bear the following information in legible and durable marking:

- a) the name or trade mark of the manufacturer, or both;
- b) the type of ruling;

- c) when relevant, whether or not the ruling incorporates a margin line;
- d) the type of sheet, that is, single or fly (double);
- e) the number of sheets per packet; and
- f) any additional information specified by the purchaser (see A.2 (f) of Annex A).

NOTE Only when a packet of paper contains 500 sheets (or fly sheets) of paper, may it be referred to as a ream. A packet that contains any other number of sheets, e.g. 480 sheets (or fly sheets) of paper should not be referred to as a ream.

10.3.2 Bulk containers

Each bulk container shall bear, in legible and durable marking, the information specified in 10.3.1(a) to 10.3.1 (e), the total number of packets of paper in the container, and any additional information specified by the purchaser (see A.2(f) of Annex A).

Annex A (normative)

Notes to purchasers

A.1 Books

The requirements below shall be specified in tender invitations and in each order or contract.

- a) the type of book (see 5.1 and Table 4);
- b) when relevant, the format (see 5.3 and Table 4);
- c) in the case of external examination books, and when relevant, the nominal number of pages (see 5.4 and table 4);
- d) when relevant, the grade of paper (see 5.5 and Table 4);
- e) when and as relevant, the type of ruling, whether or not a margin or dividing line is required and whether all pages or only alternate pages are to be ruled (see 5.7.1, 6.10 and Table 4);
- f) when relevant, details of the printing required (see 5.9);
- g) in the case of books for external examinations, the colour of the cover material (see 6.10.2);
- h) in the case of partly indexed books, and when and as relevant, that letters are to be omitted from the indexed pages and that the other pages are not to be numbered (see 6.11.2);
- i) when relevant, the number of books per packet (see 10.1.1);
- j) when and as relevant, that the books are to be packed into corrugated containers and the number of packets per container (see 10.1.2); and
- k) any additional information to be marked on packets and corrugated containers (see 10.2.1 (h) and 10.2.2).

A.2 Sheets

The requirements below shall be specified in tender invitations and in each order or contract.

- a) the type of ruling on sheets (see 7.1 and 7.5);
- b) the grade of paper (see 7.2);
- c) when relevant, the format (see 7.3) and whether a left-hand margin is required (see 7.5.2);
- d) when relevant, the number of sheets per packet (see 10.1.1);

NOTE Only when a packet of paper contains 500 sheets (or fly sheets) of paper may it be referred to as a ream. A packet that contains any other number of sheets, e.g. 480 sheets (or fly sheets) of paper, should not be referred to as a ream.

- e) when and as relevant, that packets of sheets of paper are to be packed into corrugated board containers and the number of packets of paper per container (see 10.1.2); and
- f) any additional information to be marked on packets of paper and corrugated board containers [see 10.3.1 (f)].

Certification marking

Products that conform to Uganda standards may be marked with Uganda National Bureau of Standards (UNBS) Certification Mark shown in the figure below.

The use of the UNBS Certification Mark is governed by the Standards Act, and the Regulations made thereunder. This mark can be used only by those licensed under the certification mark scheme operated by the Uganda National Bureau of Standards and in conjunction with the relevant Uganda Standard. The presence of this mark on a product or in relation to a product is an assurance that the goods comply with the requirements of that standard under a system of supervision, control and testing in accordance with the certification mark scheme of the Uganda National Bureau of Standards. UNBS marked products are continually checked by UNBS for conformity to that standard.

Further particulars of the terms and conditions of licensing may be obtained from the Director, Uganda National Bureau of Standards.



