



Government
of Canada

Gouvernement
du Canada

Canadian General
Standards Board

Office des normes
générales du Canada

CAN/CGSB-98.1-2023

Supersedes CAN/CGSB-98.1-2018



National flag of Canada (Outdoor use)

Canadian General Standards Board **CGSB**

SCC  CCN

Canada 

Experience and excellence

Expérience et excellence

CGSB
ONGC

Canadian General Standards Board statement

The CANADIAN GENERAL STANDARDS BOARD (CGSB), under whose auspices this standard has been developed, is a government directorate within Public Services and Procurement Canada. CGSB is engaged in the production of voluntary standards in a wide range of subject areas through the media of standards committees and the consensus process. The standards committees are composed of representatives of relevant interests including producers, consumers and other users, retailers, governments, educational institutions, technical, professional and trade societies, and research and testing organizations. Any given standard is developed on the consensus of views expressed by such representatives.

CGSB has been accredited by the Standards Council of Canada as a national Standards Development Organization. The standards that CGSB develops and offers as National Standards of Canada conform to the requirements and guidance established for this purpose by the Standards Council of Canada. In addition to standards it publishes as National Standards of Canada, CGSB may produce other deliverables that meet particular needs, in response to requests from a variety of sources in both the public and private sectors. CGSB standards and CGSB's National Standards are developed in conformance with the policies described in the CGSB Policy and Procedures Manual for the Development and Maintenance of Standards.

CGSB's standards are subject to review and revision to ensure that they keep abreast of technological progress. CGSB will review and publish this standard on a schedule not to exceed five years from the date of publication. Suggestions for their improvement, which are always welcome, should be brought to the notice of the standards committees concerned. Changes to standards may be issued as amendments or as new editions of standards.

An up-to-date listing of CGSB's standards, including details on latest issues and amendments, is found in the CGSB Catalogue at the following Web site, <http://www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html>, along with more information about CGSB products and services.

Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

The testing and evaluation of a product or service against this standard may require the use of materials and/or equipment that could be hazardous. This standard does not purport to address all the safety aspects associated with its use. Anyone using this standard has the responsibility to consult the appropriate authorities and to establish appropriate health and safety practices in conjunction with any applicable regulatory requirements prior to its use. CGSB neither assumes nor accepts any responsibility for any injury or damage that may occur during or as the result of tests, wherever performed.

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. CGSB shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

For enforcement purposes, standards shall be considered published the final day of the month of their publication date.

Contact the Canadian General Standards Board

To obtain information on CGSB, its services and standards or to obtain CGSB publications, please contact us:

web — <http://www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html>
e-mail — ncr.cgsb-ongc@tpsgc-pwgsc.gc.ca
telephone — 1-800-665-2472
mail — Canadian General Standards Board
140 O'Connor Street, Tower East
Ottawa, Ontario Canada K1A 0S5

Standards Council of Canada statement

A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

National flag of Canada

(Outdoor use)

CETTE NORME NATIONALE DU CANADA EST DISPONIBLE EN VERSIONS
FRANÇAISE ET ANGLAISE.

ICS 03.160

Published February 2023 by the
Canadian General Standards Board
Ottawa, Ontario K1A 0S5

© HIS MAJESTY THE KING IN RIGHT OF CANADA,
as represented by the Minister of Public Services and Procurement Canada,
the Minister responsible for the Canadian General Standards Board (2023).

No part of this publication may be reproduced in any form without the prior permission of the publisher.

CANADIAN GENERAL STANDARDS BOARD

Committee on the National Flag of Canada

(Voting membership at date of ballot)

Chair

Lena Horne University of Manitoba (General Interest)

General interest category

Claude Arsenault	Consultant
Jane Batcheller	University of Alberta
Joanne C. Zwinkels	Consultant
Li-Lin Tay	National Research Council of Canada
Ruth Mills	Consultant
Sogol Asghari	Consultant
Valerio Izquierdo	CTT Group

Producer category

Brian Naish	Flags Unlimited
John Francis	Tobermory Press Inc.
Murray Jefferies	Flying Colours International
Patrick Coutu	Drapeaux et Bannières L'Étendard Inc.
Robert White	Textile Artcraft Inc.

User category

Carmen Barcena	Public Services and Procurement Canada, Real Property Services
Don Mercer	Consumers Council of Canada
Jason Hutchison	National Capital Commission
Kimberly Bowie	Public Services and Procurement Canada, Acquisitions Branch
Marc Belanger	Canadian Heritage, State Ceremonial and Protocol Directorate
Michèle Beaudoin	Department of National Defence, DSSPM
Michelle Furnald	Consultant

Committee Manager (non-voting)

Sohaila Moghadam Canadian General Standards Board

Translation of this National Standard of Canada was conducted by the Government of Canada.

Preface

This National Standard of Canada CAN/CGSB-98.1-2023 supersedes the July 2018 edition.

Changes since the previous edition

- Table 4 – clarified the grey scale requirements for the red and white portions of the flag.
- Table 7 – for flag size no. 5, changed the number of grommets from 2 to 1-2.
- Added new subcategory of webbing tape (type 5 only) under materials section.
- Stitching – chain stitch has been removed as an option.
- New section was added to the standard to help facilitate environmental considerations.
- Figure 8 – added an option for constructing subtypes 1A and 2A integral header.
- Various editorial fixes related to the CGSB Style Manual.
- Added exact ranges for all tolerances.

The following definitions apply in understanding how to implement this National Standard of Canada:

- "shall" indicates a **requirement**;
- "should" indicates a **recommendation**;
- "may" is used to indicate that something is **permitted**;
- "can" is used to indicate that something is **possible**, for example, that an organization is able to do something.

Notes accompanying clauses do not include requirements or alternative requirements. The purpose of a note accompanying a clause is to separate explanatory or informative material from the text. Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

Contents		Page
1	Scope	1
2	Normative references	1
3	Symbols, acronyms and abbreviated terms	3
4	Classification	3
5	General requirements	4
6	Detailed requirements	4
7	Special considerations	12
8	Packaging, packing, labelling and marking	13
9	Inspection and sampling	13
	Bibliography	25

Figures

Figure 1	— Design of the National flag of Canada	14
Figure 2	— One-piece flag construction	14
Figure 3	— Three-piece flag construction	15
Figure 4	— Four-piece flag construction	15
Figure 5	— Construction details (for figures 2, 3 and 4)	16
Figure 6	— Header, open-sleeve — Type 1 flags	16
Figure 7	— Header, open-sleeve with tie tapes — Type 2 flags	16
Figure 8	— Construction details — Subtypes 1A and 2A flags — Integral header	17
Figure 9	— Construction details — Subtypes 1B and 2B flags — Separate header	17
Figure 10	— Header with rope and clip — Type 3 flags	18
Figure 11	— Header with rope and toggle — Type 4 flags	18
Figure 12	— Construction details — Subtypes 3A and 4A flags — Integral header	18
Figure 13	— Construction details — Subtypes 3B and 4B flags — Separate header	19
Figure 14	— Rope and clip assembly — Type 3 flags	20

Figure 15 — Rope and toggle assembly — Type 4 flags	20
Figure 16 — Header with headstick — Type 5 flags	21
Figure 17 — Header with headstick construction details – Subtypes 5A and 5B flags	22
Figure 18 — Headstick assembly — Type 5 flags	22
Figure 19 — Clips — Type 3 flags	23
Figure 20 — Spur grommets and washers — Types 3, 4 and 5 flags	23
Figure 21 — Rope end — Types 3, 4 and 5 flags	23
Figure 22 — Toggle — Type 4 flags	24
Figure 23 — Headstick — Type 5 flags	24

Tables

Table 1 — Flag types and subtypes	4
Table 2 — National flag dimensions and tolerances in centimetres	5
Table 3 — Header dimensions and tolerances in centimetres	6
Table 4 — Finished flag fabric and performance requirements	6
Table 5 — CIE chromaticity coordinates (x , y), luminance value (Y) and CIELAB (L^* , a^* , b^*) units	8
Table 6 — Cordage requirements	10
Table 7 — Number of grommets	11
Table 8 — Rope assemblies – Length of rope component	12

National flag of Canada

(Outdoor use)

1 Scope

This National Standard of Canada applies to the design, colour, materials, construction and performance requirements of the National Flag of Canada intended for outdoor use.

The testing and evaluation of a product against this standard may require the use of materials and/or equipment that could be hazardous. This standard does not purport to address all the safety aspects associated with its use. Anyone using this standard has the responsibility to consult the appropriate authorities and to establish appropriate health and safety practices in conjunction with any applicable regulatory requirements prior to its use.

Units of measurement – Quantities and dimensions used in this standard are provided in units from the International System of Units (imperial equivalents may be shown in brackets).

2 Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this National Standard of Canada. The referenced documents may be obtained from the sources noted below.

Note: The contact information provided below was valid at the date of publication of this standard.

An undated reference is to the latest edition or revision of the reference or document in question, unless otherwise specified by the authority applying this standard. A dated reference is to the specified revision or edition of the reference or document in question.

2.1 Canadian General Standards Board

CAN/CGSB-4.2 — *Textile test methods:*

No. 2 — *Conditioning textile materials for testing* (withdrawn September 2019)

No. 4.1 — *Textiles — Fabrics — Determination of Width and Length* (withdrawn December 2016)

No. 5.1 — *Unit mass of fabrics* (withdrawn September 2019)

No. 9.1 — *Breaking strength of fabrics - Strip method - Constant-time-to-break principle* (withdrawn September 2019)

No. 9.4 — *Breaking strength of yarns - Single strand method* (withdrawn September 2019)

No. 12.1 — *Tearing strength - Single-rip method* (withdrawn February 2021)

No. 18.3/ISO 105-B02 (R2010) — *Textiles - Tests for Colourfastness - Part B02: Colourfastness to Artificial light: Xenon Arc Fading Lamp Test* (withdrawn December 2016)

No. 19.1 — *Colourfastness to washing - Accelerated test - Launder-Ometer* (withdrawn September 2019)

No. 21 — *Colourfastness to sea water* (withdrawn September 2019)

No. 22 – 2004 (R2013) — *Colourfastness to rubbing (Crocking)* (withdrawn September 2019)

No. 25.1 — *Dimensional change in wetting* (withdrawn September 2019)

No. 26.2/ISO 4920:1981 (R2012) — *Textile - Determination of resistance to surface wetting (spray test) of fabrics* (withdrawn October 2017)

No. 69 — *Weather Resistance - Xenon Arc Radiation* (withdrawn September 2019)

CGSB 40-GP-1M — *Methods for sampling and testing of cordage* (withdrawn in October 2011)

CAN/CGSB-54.1 Part 1/ISO 4915:1991 — *Stitches and Seams Part 1: Textiles - Stitch Types - Classification and Terminology* (withdrawn January 2022)

CAN/CGSB-86.1 — *Care Labelling of Textiles* (withdrawn October 2017)

2.1.1 Contact information

The above standards, whether active or withdrawn, may be obtained from the Canadian General Standards Board. Telephone: 1-800-665-2472. E-mail: ncr.cgsb-ongc@tpsgc-pwgsc.gc.ca. Web site: <https://www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html>.

2.2 ASTM International

ASTM D2244-22 — *Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates*

ASTM E308-22 — *Standard Practice for Computing the Colors of Objects by Using the CIE System*

ASTM E1331-15(2019) — *Standard Test Method for Reflectance Factor and Color by Spectrophotometry using Hemispherical Geometry*

2.2.1 Contact information

The above may be obtained from ASTM International. Telephone: 1-877-909-2786. Web site: <https://www.astm.org/>. They can also be obtained from IHS Markit Standards Store by S&P Global. Telephone: 613-237-4250 or 1-800-447-2273. E-mail: gic@ihscanada.ca. Web site: <https://global.ihs.com/>.

2.3 American Association of Textile Chemists and Colorists

AATCC EP 6 — *Evaluation Procedure for Instrumental Color Measurement*

2.3.1 Contact Information

The above may be obtained from the American Association of Textile Chemists and Colorists. Telephone: 919-549-8141. Web site: <https://aatcc.org/>.

2.4 International Organization for Standardization

ISO/CIE 11664-1:2019 — *Colorimetry – Part 1: CIE standard colorimetric observers*

ISO/CIE 11664-2:2022 — *Colorimetry – Part 2: CIE standard illuminants*

2.4.1 Contact information

The above may be obtained from International Organization for Standardization, ISO Central Secretariat. Telephone: +41 22 749 01 11. E-mail: central@iso.org. Web site: <https://www.iso.org/about-us.html>. They can also be obtained from IHS Markit Standards Store by S&P Global. Telephone: 613-237-4250 or 1-800-447-2273. E-mail: gic@ihscanada.ca. Web site: <https://global.ihs.com/>.

2.5 International Commission on Illumination (CIE)

CIE 015:2018 — *Colorimetry, 4th Edition*

2.5.1 Contact information

The above may be obtained from the CIE Central Bureau. Telephone: +43 1 714 31 87. E-mail: ciecb@cie.co.at. Web site: <https://cie.co.at/>.

2.6 United States Department of Defence

A-A-59826 — *Thread, Nylon*

A-A-59963 — *Thread, Polyester*

2.6.1 Contact information

The above may be obtained from DLA Document Services. Address questions to ASSIST Help Desk at 215-737-8000. Web site: <https://quicksearch.dla.mil/>.

3 Symbols, acronyms and abbreviated terms

The following abbreviations and acronyms are used in this National Standard of Canada.

AATCC – American Association of Textile Chemists and Colorists

ASTM – American Society for Testing and Materials

CIE – International Commission on Illumination

IHS – Information Handling Systems

ISO – International Organization for Standardization

SI – International System of Units

4 Classification

The flag shall be supplied in the following types and sizes as specified.

4.1 Types and subtypes

The flag shall be the types and subtypes specified in Table 1.

Table 1 — Flag types and subtypes

Type	Description	In accordance with figure(s)
1	Header with open sleeve	6
2	Header with open sleeve and tie tapes	7
3	Header with rope and clip	10, 14, 20, 21, 22
4	Header with rope and toggle	11, 15, 21, 22, 23
5	Header with headstick	16, 19, 21, 22, 24
Subtype	—	—
1A	Integral header	8
1B	Separate header	9
2A	Integral header	8
2B	Separate header	9
3A	Integral header	12
3B	Separate header	13
4A	Integral header	12
4B	Separate header	13
5A	Integral header	17
5B	Separate header	18

4.2 Sizes

The flag shall be the sizes specified in Table 2.

5 General requirements

The flag shall be free of defects in materials and workmanship that may affect its appearance or serviceability.

6 Detailed requirements

6.1 Design

The flag shall be of the proportions two by length and one by width, containing in its centre a white square the depth of the flag, with a single 11-point red maple leaf centred therein, in accordance with figure 1.

6.2 Dimensions¹ of flag and header

The flag shall be the dimensions and tolerances specified in Table 2 by following the instructions for measuring the length (6.2.1) and width (6.2.2) when measured in accordance with CAN/CGSB-4.2 No. 4.1. The header shall be the dimensions and tolerances specified in Table 3.

6.2.1 Length

The length is measured by taking the average of the two outside edges and one additional horizontal measurement equally spaced across the flag.

6.2.2 Width

The width is measured by taking the average of the two outside edges and three additional vertical measurements equally spaced across the flag.

Table 2 — National flag dimensions and tolerances in centimetres

Flag size	Width (X) ^a (exact range)	Length (L) ^a (exact range)	Red (Y) ^a (exact range)	White (Z) ^a (exact range)
1	20 ± 0.3 (19.7 to 20.3)	40 ± 0.5 (39.5 to 40.5)	10.0 ± 0.2 (9.8 to 10.2)	20 ± 0.3 (19.7 to 20.3)
2	30 ± 0.5 (29.5 to 30.5)	60 ± 1.0 (59 to 61)	15.0 ± 0.3 (14.7 to 15.3)	30 ± 0.5 (29.5 to 30.5)
3	45 ± 0.7 (44.3 to 45.7)	90 ± 1.4 (88.6 to 91.4)	22.5 ± 0.3 (22.2 to 22.8)	45 ± 0.7 (44.3 to 45.7)
4	65 ± 1.0 (64 to 66)	130 ± 2.0 (128 to 132)	32.5 ± 0.5 (32 to 33)	65 ± 1.0 (64 to 66)
5	90 ± 1.4 (88.6 to 91.4)	180 ± 2.7 (177.3 to 182.7)	45.0 ± 0.7 (44.3 to 45.7)	90 ± 1.4 (88.6 to 91.4)
6	115 ± 1.7 (113.3 to 116.7)	230 ± 3.5 (226.5 to 233.5)	57.5 ± 0.9 (56.6 to 58.4)	115 ± 1.7 (113.3 to 116.7)
7	135 ± 2.0 (133 to 137)	270 ± 4.0 (266 to 274)	67.5 ± 1.0 (66.5 to 68.5)	135 ± 2.0 (133 to 137)
8	180 ± 2.7 (177.3 to 182.7)	360 ± 5.4 (354.6 to 365.4)	90.0 ± 1.4 (88.6 to 91.4)	180 ± 2.7 (177.3 to 182.7)
9	230 ± 3.5 (226.5 to 233.5)	460 ± 6.9 (453.1 to 466.9)	115 ± 1.7 (113.3 to 116.7)	230 ± 3.5 (226.5 to 233.5)
10	1500 ± 8.0 (1492 to 1508)	3000 ± 15.0 (2985 to 3015)	750 ± 4.0 (746 to 754)	1500 ± 8.0 (1492 to 1508)

^aSee Figures 2, 3, and 4.

¹ In the case of dispute, flags have to be conditioned in accordance with CAN/CGSB-4.2 No. 2 before they are measured.

6.2.3 Header

The header of the flag shall be the dimensions and tolerances specified in Table 3.

Table 3 — Header dimensions and tolerances in centimetres

Flag size classification ^a	Header (W) ^b dimension in cm \pm 2% (exact range)				
	Subtypes 1A, 2A W=V ^c	Subtypes 1B, 2B W=V ^d	Subtypes 3A, 4A W=Z ^e	Subtypes 3B, 4B W=Z ^f	Subtypes 5A, 5B W=Z ^g
1	4.0 (3.92 to 4.08)		6.5 (6.37 to 6.63)		
2 - 10	6.5 (6.37 to 6.63)				
^a See Table 2. ^b See figures 2, 3, and 4 for location of header (W). ^c See figure 8*. ^d See figure 9. ^e See figure 12. ^f See figure 13. ^g See figure 17. * Figure 8 – Section D-D has two options: A= with fold; B = without fold.					

6.3 Fabric

The fabric properties and performance of the flag shall be in accordance with the requirements in Table 4.

Table 4 — Finished flag fabric and performance requirements

Property	Requirement		Test method CAN/CGSB-4.2, <i>Textile test methods</i>
Weave	Plain, 1 x 1		Not applicable
Mass, g/m ²	Minimum	60	No. 5.1
	Maximum	70	
Breaking strength, N, minimum ^a	Initial ^b warp	725	No. 9.1
	Initial ^b weft	630	
	Weathered ^c warp	400	
	Weathered ^c weft	350	

Property	Requirement		Test method CAN/CGSB-4.2, Textile test methods
Tearing strength, N, minimum	Initial warp	22	No. 12.1
	Initial weft	22	
Dimensional change in wetting, maximum %	Warp	± 2	No. 25.1
	Weft	± 2	
Colourfastness, minimum	To light (red and white) ^{d, e}	160 hours, Minimum grey scale 4	No. 18.3/ISO 105-B02
	To washing (red and white) ^d	Minimum grey scale 4	No. 19.1 Test No. 1 ^f
	To seawater ^{d, g, h} - colour change for red portion - staining for white portion	Minimum grey scale 4 Grey scale 5	No. 21 ^f
	To dry and wet (water) ^{d, i} crocking - colour change for red portion - staining for white portion	Minimum grey scale 4 Grey scale 5	No. 22 ^f
Water resistance, minimum	Initial	ISO 5 (100)	No. 26.2/ISO 4920
	After 2 launderings ^j in accordance with care labelling	ISO 3 (80)	

^a Samples to be tested: 2 red; 2 white; 1 half red and half white; calculate the average of the five samples.

^b To meet 6.7.1, indicate which yarn direction lies along the length of the flag.

^c 160 h in accordance with CAN/CGSB-4.2 No. 69, option 4.

^d Sample shall be half red and half white.

^e Soda-lime/borosilicate system.

^f In this standard, the multi-fibre is not evaluated.

^g Sample of red and white sandwiched together.

^h Test for colourfastness to seawater is optional and dependent on end use.

ⁱ Repeat dry and wet crocking tests for each coloured section of the flag, rubbing half-red and half-white each time. There shall be no observable streaking, smearing or staining onto the half-white rubbed parts.

^j Rinse thoroughly after each washing to ensure no detergent remains in fabric.

6.4 Colours

6.4.1 Colour requirements

The colour values contained in the Federal Identity Program Technical Specifications for corporate identity shall not supersede the CIE colour coordinates specified in this standard.

The red and white colours shall have CIE colour chromaticity coordinates (x , y) and luminance value (Y) or equivalent CIELAB values (L^* , a^* , b^*) when calculated in accordance with ASTM E308, using CIE Standard Illuminant D65 (ISO/CIE 11664-2 — *Colorimetry – Part 2: CIE Standard Illuminants*) and either the 1964 (10°) or 1931 (2°) Standard Colorimetric Observers in accordance with ISO/CIE 11664-1:2019, *Colorimetry – Part 1: CIE Standard Colorimetric*

Observers, as given in Table 5, where the choice of appropriate observer conditions follows CIE recommendations (CIE 015:2018):

- a) the 2° standard observer colorimetric specifications should be used for flag dimensions and viewing conditions that provide a visual field between 1° and 4°;

Note: A 2° visual field is a sample size of at least 17 mm at a viewing distance of 0.5 m.

- b) the 10° standard observer should be used for flag dimensions and viewing conditions that provide a visual field greater than 4°.

Note: A 4° visual field is a sample size of at least 34 mm at a viewing distance of 0.5 m.

Table 5 — CIE chromaticity coordinates (x, y), luminance value (Y) and CIELAB (L*, a*, b*) units

Colour	CIE chromaticity coordinates (x, y) Luminance value (Y)			Equivalent CIELAB (L*, a*, b*) units		
	x (exact range)	y (exact range)	Y (exact range)	L*	a*	b*
Red	0.576 ± 0.028 (0.548 to 0.604)	0.315 ± 0.012 (0.303 to 0.327)	9.5 ± 1.5 (8 to 11)	36.93	55.61	28.98
White	0.328 ± 0.012 (0.316 to 0.34)	0.344 ± 0.015 (0.329 to 0.359)	78.0 ± 3.0 (75 to 81)	90.78	0.50	7.97

6.4.1.1 Colour measurement

Colour measurement shall be in accordance with ASTM E308, ASTM E1331 and AATCC Evaluation Procedure 6, par. A1.3 under the following conditions:

- Use a hemispherical spectrophotometer or spectrocolorimeter² with 0°:d or d:0° geometry or with 8°:de or de:8° geometry with the specular (mirror reflection) component excluded.
- For the red colour measurements, for each location, use four layers of fabric with the same face over a matte black³ (Y or luminous reflectance of no more than 4%) opaque background.
- For the white colour measurements, for each location, use eight layers of fabric with the same face over a matte black (Y or luminous reflectance of no more than 4%) opaque background.
- For the red colour sampling, on the same flag face, measure, at two locations, each of the three red areas (panels), making two measurements (at 0° and 90°) at each location. Calculate the average of the twelve measurements.
- For the white colour sampling, on the same surface, measure four locations of the white area, making two measurements (at 0° and 90°) at each location. Calculate the average of the eight measurements.

Note: When conducting colour measurements and evaluating colourfastness (see 6.5), users of this standard should be aware that the red colour may be thermochromic, that is it may undergo rapid reversible colour change with a change in temperature. Thermochromism is a well-known property of contemporary textile dyestuffs.

² A simulated D65 source should be used for polychromatic illumination.

³ A test mask for colourfastness to light similar to the one from Atlas Material Testing Technology, 1500 Bishop Court, Mount Prospect, IL 60056, U.S.A. (Ref: No. SL-8A or CD-3). Telephone: +1-773-327-4520. Web site: <https://www.atlas-mts.com/>, or any equivalent product meeting the requirements should be used.

6.4.1.2 Colour tolerance

The tolerances shown in Table 5 of the averaged measurements for each colour (see 6.4.1), calculated in accordance with ASTM D2244 and expressed in commercial factor (cf), shall be no more than 3.0 units $\Delta E_{CMC(2:1)}$.

6.4.2 Colour difference between the two faces of the flag

The colours shall be uniform with no differences between like-coloured panels on either face of the flag (see 6.4.2.1).

6.4.2.1 Colour measurement

Measurement of the difference in colour between the two faces of the flag shall be the same as in 6.4.1 and 6.4.1.2 except that one layer of sample over a matte black (Y or luminous reflectance of no more than 4%) opaque background is used during measurement of both red and white areas.

6.4.2.2 Colour tolerance

The variation in the white and red colours between the two faces of the flag (see 6.4.2.1), calculated in accordance with ASTM D2244 and expressed in commercial factor (cf), shall be no more than 1.5 units $\Delta E_{CMC(2:1)}$ and the change in hue angle (h) shall be no more than 3.0° for both colours.

6.5 Colourfastness

Colourfastness of the flag shall be in accordance with the requirements in Table 4. Colourfastness to seawater is optional, depending on end use.

6.6 Materials

6.6.1 Flag

The flag shall be made of woven fabric in accordance with Table 4.

6.6.2 Header

The header material shall be white fabric in accordance with Table 4.

6.6.3 Sewing thread

The flag shall be sewn with red and/or white thread in accordance with US Department of Defence A-A-59826 and A-A-59963.

6.6.4 Tie tapes (Type 2 only)

There shall be two 16 x 400 mm woven or braided white tapes, with a mass of 3.50 ± 0.25 g/m² when tested in accordance with CAN/CGSB-4.2 No. 5.1. The free length of the tie tape shall be approximately 18 cm.

6.6.5 Cordage (Types 3, 4 and 5 only)

The cordage shall be plaited or braided nylon rope of plied filament yarns with properties in accordance with Table 6, the specimen length determination being made after 2 min under force F .

Table 6 — Cordage requirements

Flag size ^a	Nominal diameter (mm)	Linear density ^b ktex (g/m) ± 5%	Force F ^c daN	Minimum breaking strength ^d , daN
3, 4 and 5	5 ± 0.5 mm (4.5 to 5.5 mm)	15 (14.25 to 15.75)	3.5	356
6 and up	8 ± 1.5 mm (6.5 to 9.5 mm)	35 (33.25 to 36.75)	9	900

^a See Table 2.

^b Tested in accordance with CGSB 40-GP-1M, method 4.

^c Force to be applied when determining diameter and linear density.

^d Tested in accordance with CAN/CGSB-4.2 No. 9.4.

6.6.6 Rope ends (Types 3, 4 and 5 only)

The rope ends shall be solid brass or yellow zinc dichromate plated steel set without rough edges or burrs in accordance with figure 21.

6.6.7 Spur grommets and washers (Types 3, 4 and 5 only)

Spur grommets and washers shall be type No. 2, 11.11 ± 0.4 mm inside diameter in accordance with figure 20.

6.6.8 Clips (Type 3 only)

The clips shall be brass or yellow zinc dichromate plated steel flag clips in accordance with figure 19.

6.6.9 Toggles (Type 4 only)

The toggles shall be in accordance with figure 22 and shall be made from birch or maple, free of all imperfections.

6.6.10 Headstick (Type 5 only)

The headstick shall be in accordance with figure 23 and shall be made from birch or maple, free of all imperfections.

6.6.11 Lashing twine (Type 5 only)

The lashing twine shall be 3-ply, 420 tex, heat-set and white waxed nylon twine with a breaking strength of not less than 265 N when tested in accordance with CAN/CGSB-4.2 No. 9.4.

6.6.12 Webbing tape (Type 5 only)

Add a 2 cm wide lightweight nylon webbing tape to be cut 5 cm ± 2 mm in length.

6.7 Construction

6.7.1 General

The flag shall be dye-printed. The tolerance for bowing of the vertical red panel edges is:

- a) Size 1 (20 x 40 cm): 6 mm;

- b) Size 2 (30 x 60 cm) through size 5 (90 x 180 cm): 15 mm;
- c) Size 6 (115 x 230 cm) through size 10 (1500 x 3000 cm): 18 mm.

For all flags, the length of the flag, exclusive of header and seams, shall have a minimum breaking strength before weathering of 725 N.

6.7.2 Construction of the flag

Construction of the flag shall be in accordance with the following:

- a) One-piece flag (sizes 1 to 8) – Figures 2 and 5 (sections A-A and B-B);
- b) Three-piece flag (size 8) – Figures 3 and 5 (sections A-A, B-B and C-C);
- c) Four-piece flag (sizes 9 and 10) – Figures 4 and 5 (sections A-A, B-B and C-C).

6.7.3 Seams and stitching

All seams shall be joined by lockstitch Type 301 or Type 401 in accordance with CAN/CGSB-54.1 Part 1/ISO 4915 with not less than 2.8 and not more than 3.6 stitches per centimetre. The ends of all stitchings and any breaks in the sewing thread during stitching shall be securely backstitched.

6.7.4 Grommets (Types 3, 4 and 5 only)

Grommets shall be inserted in the headers of all size 8, 9 and 10 flags in accordance with figures 10, 11 or 16 (according to flag type) and Table 7. They shall be inserted in the headers of size 3 through 7 flags in accordance with Table 7.

Table 7 — Number of grommets

Flag size ^a	Number of grommets
3	1
4	1
5	1 – 2
6	2
7	3
8	4
9	5
10	5
^a See Table 2.	

6.7.5 Rope and clip assembly (Type 3 only)

The rope and clip assembly shall be in accordance with figure 14 and Table 8.

6.7.6 Rope and toggle assembly (Type 4 only)

The rope and toggle assembly shall be in accordance with figure 15 and Table 8.

6.7.7 Headstick assembly (Type 5 only)

The headstick rope and clip assembly shall be in accordance with figure 18 and Table 8.

Table 8 — Rope assemblies – Length^a of rope component

Flag size ^b	Rope and clip ^c cm ± 3% (exact range)	Rope and toggle ^c cm ± 3% (exact range)	Headstick ^c cm ± 3% (exact range)
2	70 (67.9 to 72.1)	95 (92.15 to 97.85)	—
3	90 (87.3 to 92.7)	110 (106.7 to 113.3)	—
4	110 (106.7 to 113.3)	135 (130.95 to 139.05)	—
5	135 (130.95 to 139.05)	160 (155.2 to 164.8)	—
6	—	185 (179.45 to 190.55)	—
7	180 (174.6 to 185.4)	205 (198.85 to 211.15)	165 (160.05 to 169.95)
8	225 (218.25 to 231.75)	250 (242.5 to 257.5)	210 (203.7 to 216.3)
9	270 (261.9 to 278.1)	295 (286.15 to 303.85)	255 (247.35 to 262.65)

^a When measured before assembly, that is, from cut end to cut end.

^b See Table 2.

^c Component no. 5 in figures 14 and 15, component no. 4 in figure 18.

7 Special considerations

7.1 Environmental, health and safety

7.1.1 Recycled, recovered and/or environmentally preferable materials

Recycled, recovered and/or environmentally preferable materials should be used to the maximum extent possible, provided that the materials meet or exceed the operational requirements and promote economically advantageous life cycle costs.

7.1.2 Manufacturing processes

Manufacturing processes with minimal environmental impact are encouraged.

7.1.3 Materials and manufacturing methods

The use of environmentally preferable materials and manufacturing methods applies to the items covered by this standard as well as to any of the packaging and shipping materials and methods required for delivery.

Note: Packaging should be designed and packaging materials selected to minimize waste and environmental impact, both during transport to and recovery from the consumer. The reuse of packaging or the use of recycled or recyclable components should be incorporated where recycling facilities exist. Where possible, any plastic components in the packaging should be identified with a composition code to facilitate recycling.

8 Packaging, packing, labelling and marking

8.1 Packaging and packing

Unless otherwise specified, packaging and packing shall conform to normal commercial practices (see 7.1.3).

8.2 Labelling and marking

The flag shall have stamped legibly on its header in indelible red or black ink in characters no larger than 12 mm in height:

- a) mark identifying that the flag has met the requirements of CAN/CGSB-98.1;
- b) date of manufacture;
- c) size.

The flag shall have affixed to its package a label upon which at least the following information and instructions⁴, in both English and French, is printed in a type height not less than 6 mm and not more than 12 mm:

Manufacturer's name and mailing address or CA number
 "CANADA"
 "National Flag of Canada (Outdoor use)"
 Cleaning and drying instructions (in accordance with CAN/CGSB-86.1).

Nom et adresse du fabricant ou le numéro d'identification CA
 « Canada »
 « Drapeau national du Canada (pour utilisation à l'extérieur) »
 Directives de nettoyage et de séchage (conformément à la norme CAN/CGSB-86.1).

9 Inspection and sampling

Sampling for inspection and testing shall be left to the discretion of the inspection authority, unless a specific sampling plan is specified.

⁴ Cleaning and drying instructions may be printed separately and enclosed in the package.

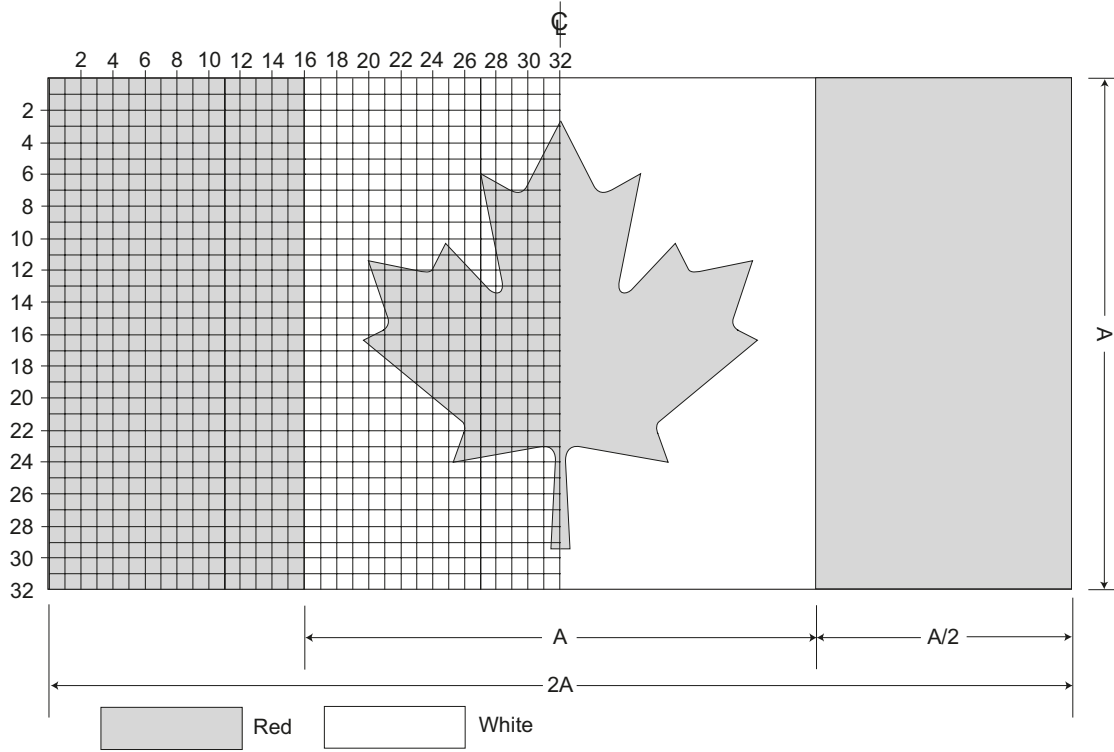


Figure 1 — Design of the National flag of Canada

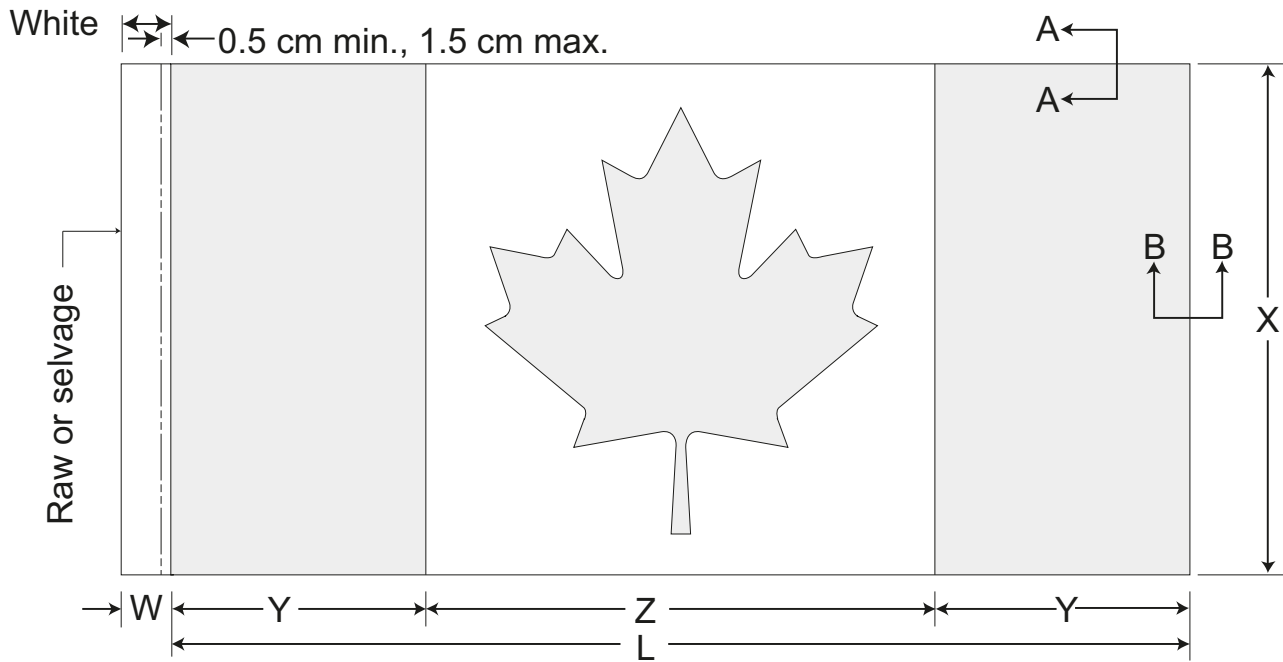


Figure 2 — One-piece flag construction

Note: Flag sizes 1 to 8: 20 x 40 cm to 180 x 360 cm. Refer to figure 5 for construction details.

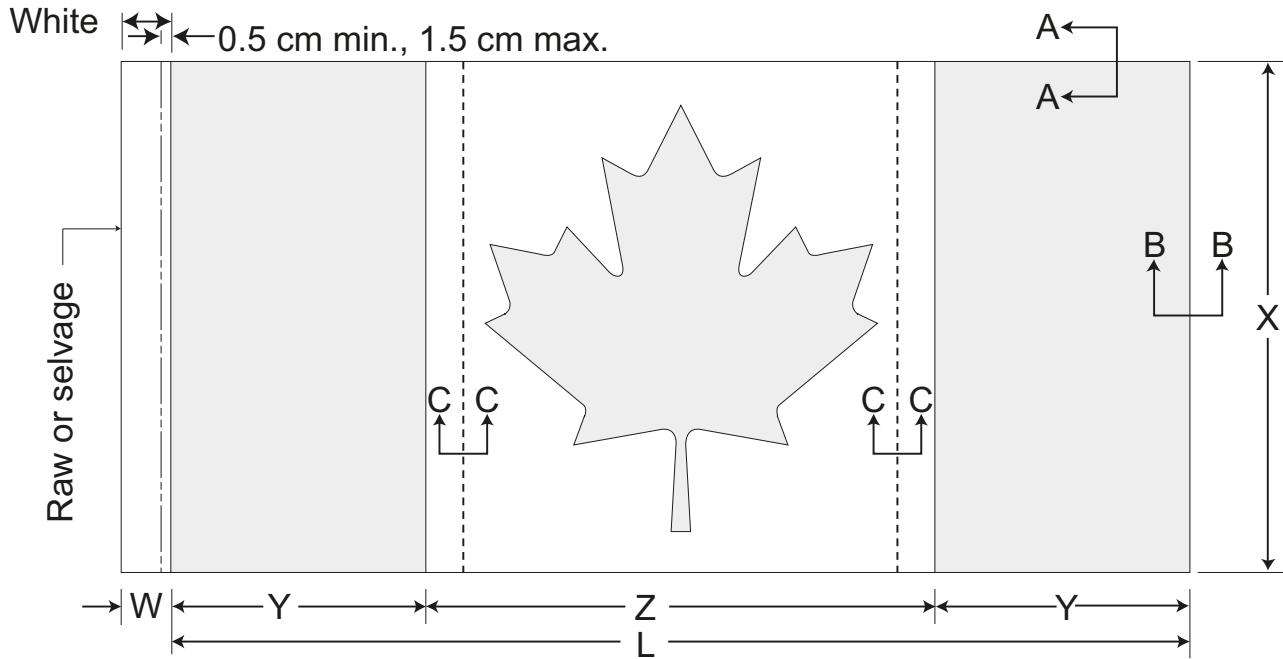


Figure 3 — Three-piece flag construction

Note: Flag size 8: 180 x 360 cm. Refer to figure 5 for construction details.

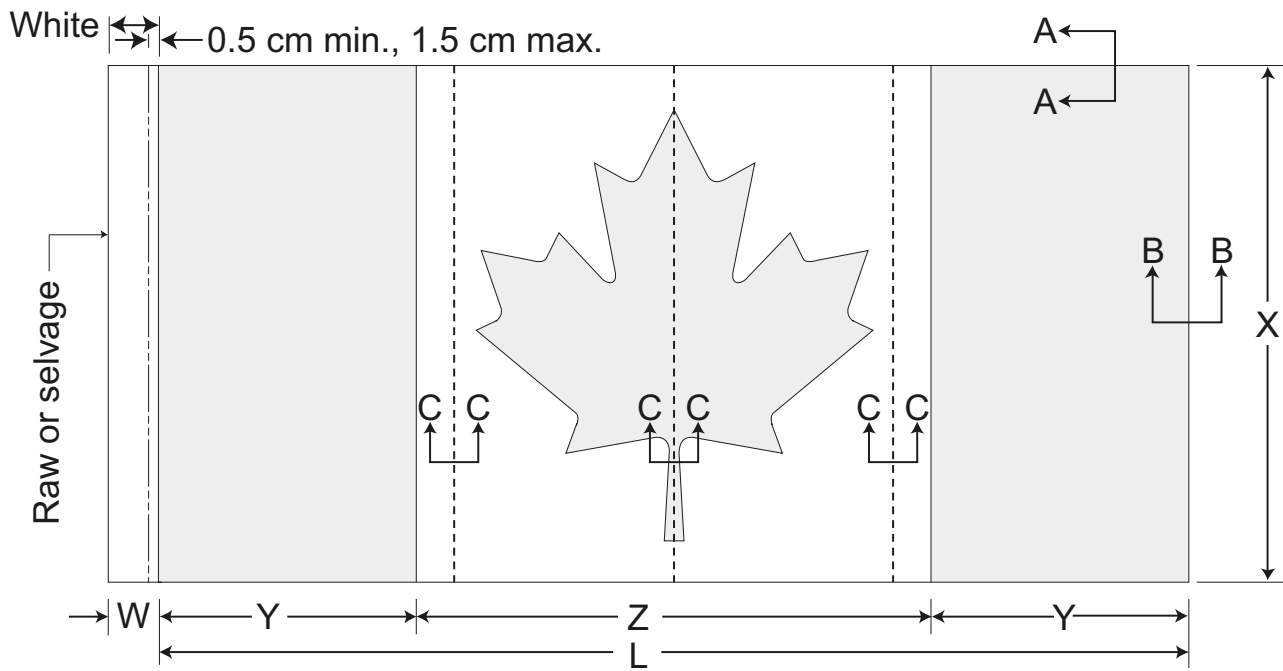
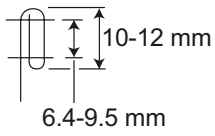
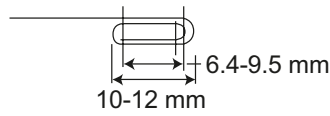


Figure 4 — Four-piece flag construction

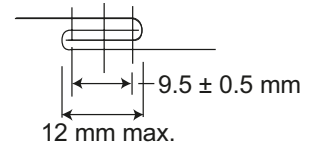
Note: Flag sizes 9 and 10: 230 x 460 cm to 1500 x 3000 cm. Refer to Figure 5 for construction details.



Section A-A



Section B-B



Section C-C

Figure 5 — Construction details (for figures 2, 3 and 4)

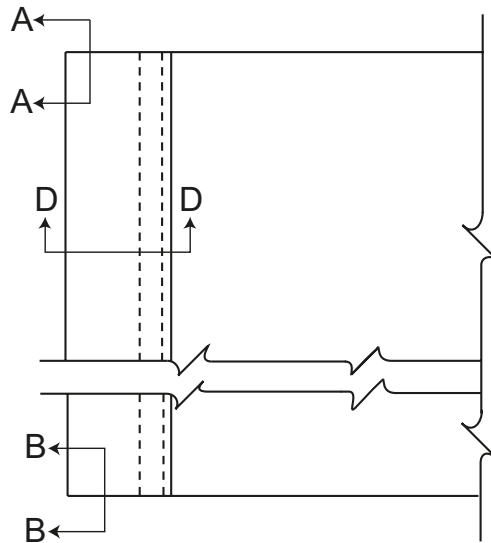


Figure 6 — Header, open-sleeve — Type 1 flags

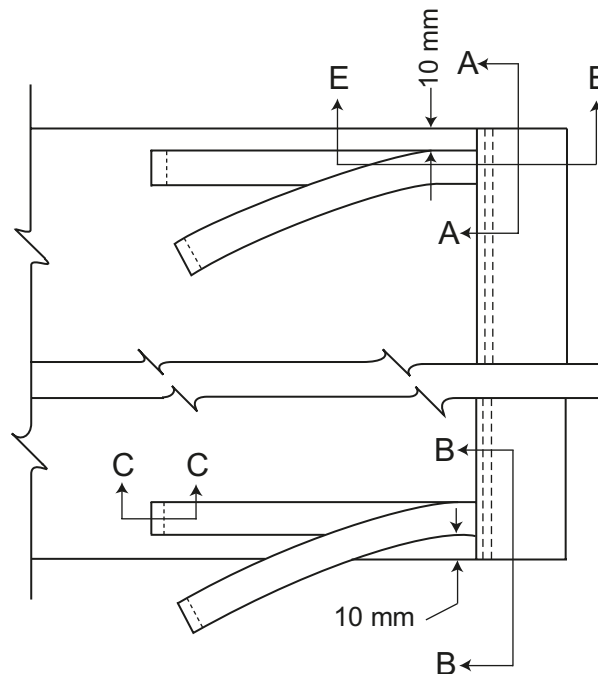


Figure 7 — Header, open-sleeve with tie tapes — Type 2 flags

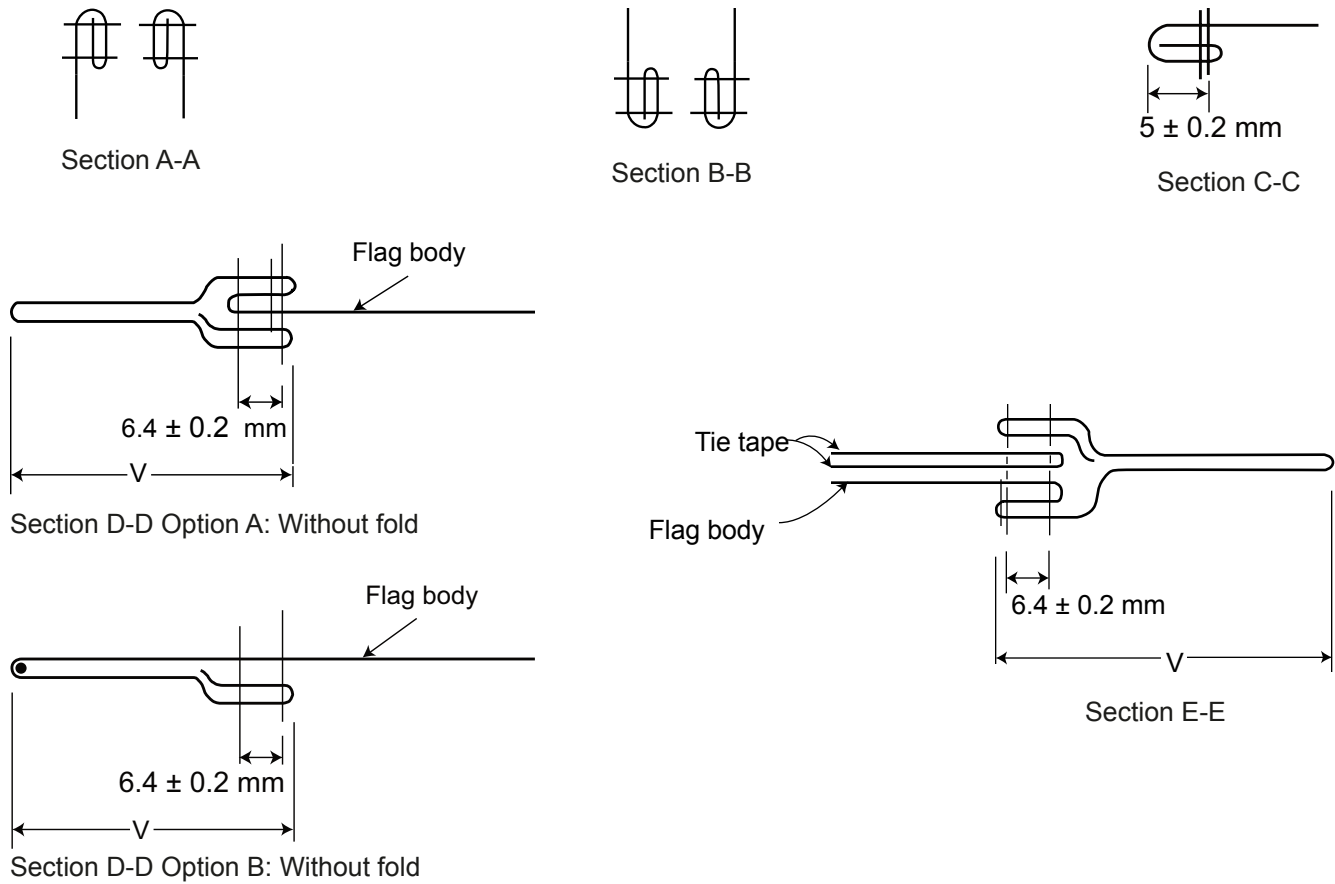


Figure 8 — Construction details — Subtypes 1A and 2A flags – Integral header

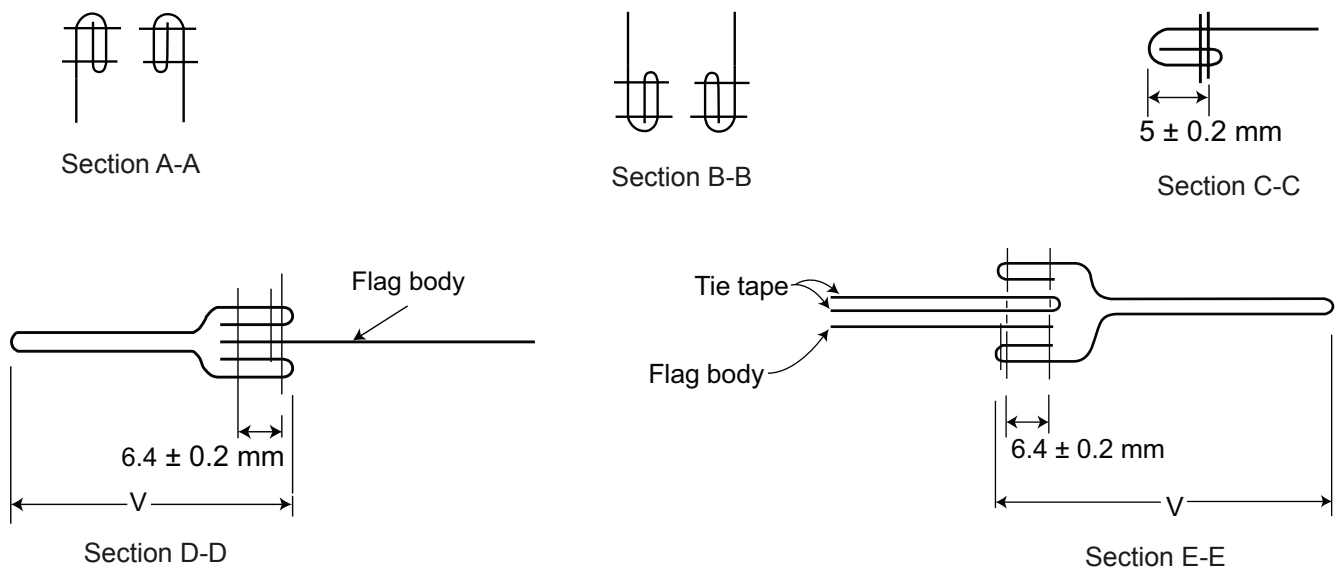


Figure 9 — Construction details – Subtypes 1B and 2B flags – Separate header

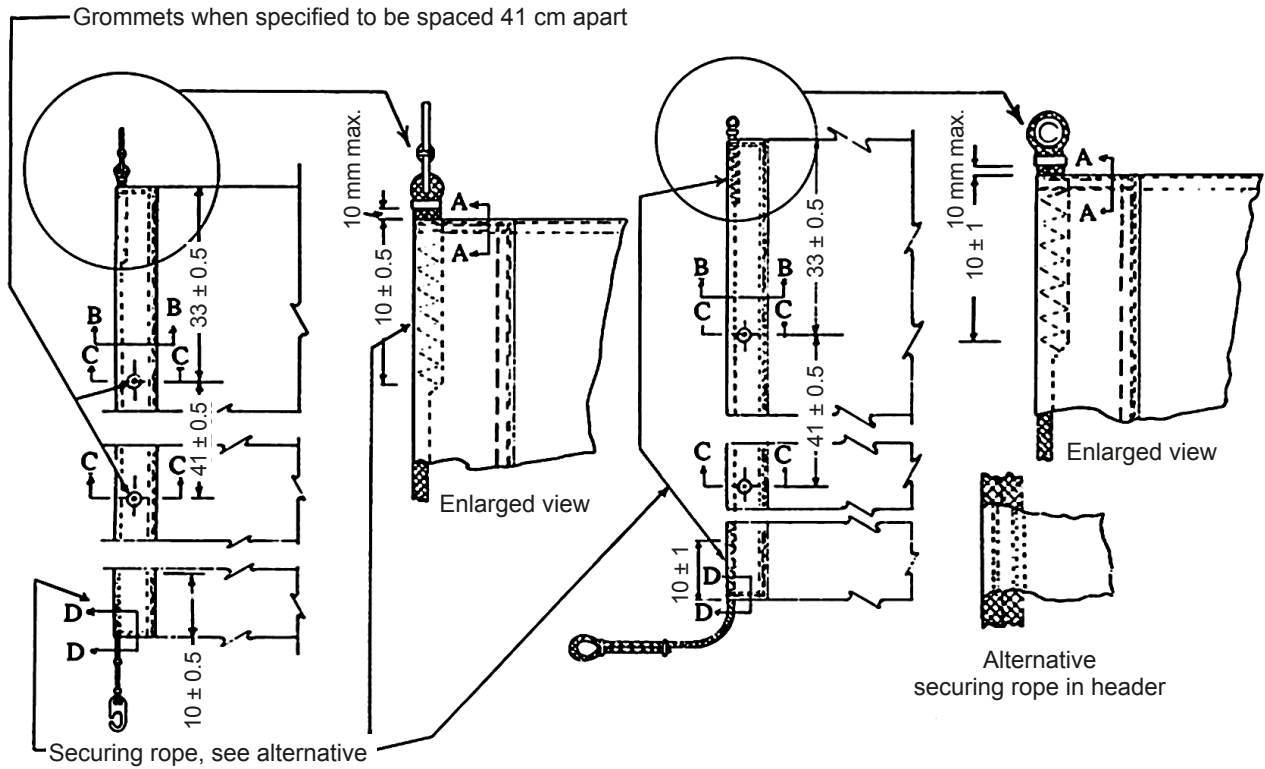


Figure 10 — Header with rope and clip
— Type 3 flags

Figure 11 — Header with rope and toggle
— Type 4 flags

Unless otherwise specified, dimensions are in centimetres.

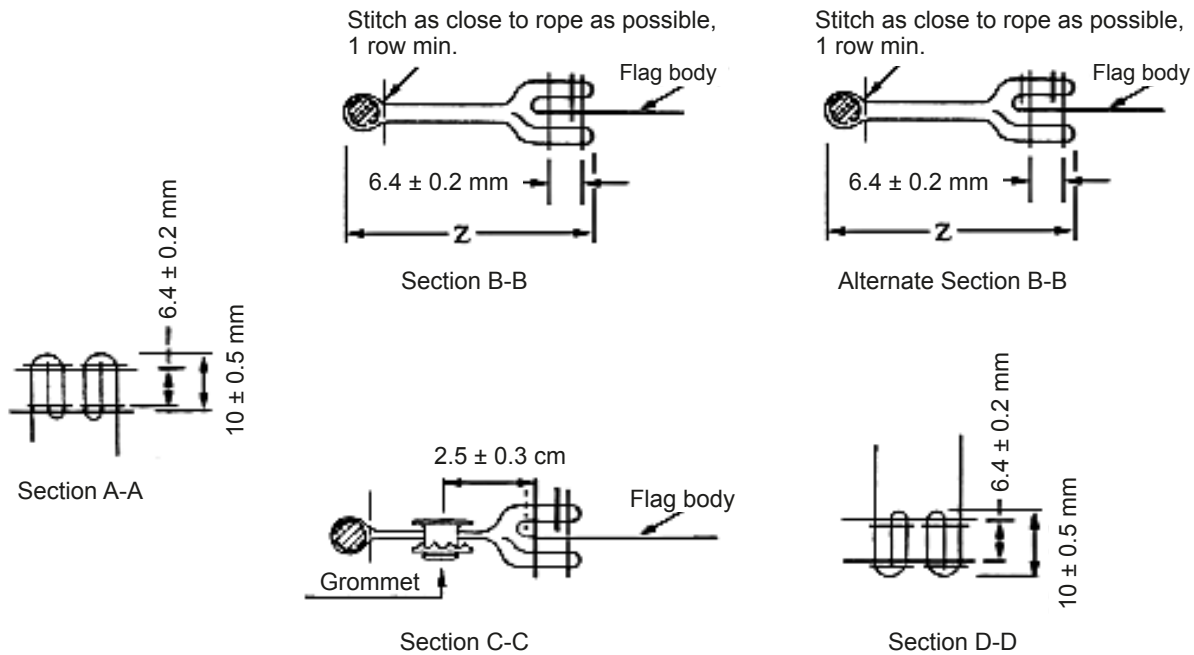


Figure 12 — Construction details — Subtypes 3A and 4A flags — Integral header

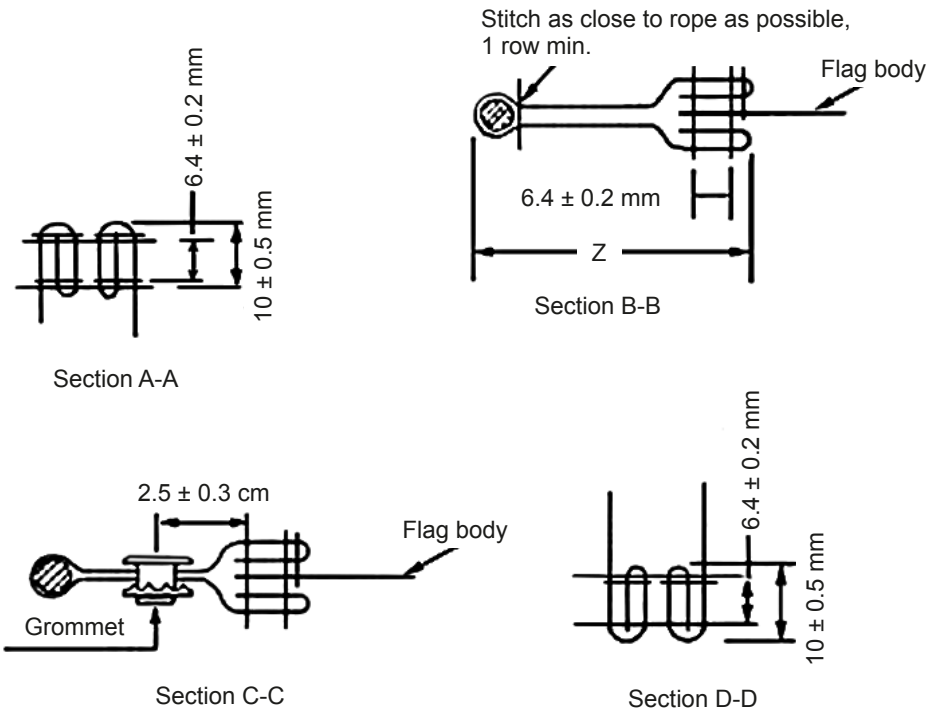


Figure 13 — Construction details — Subtypes 3B and 4B flags – Separate header

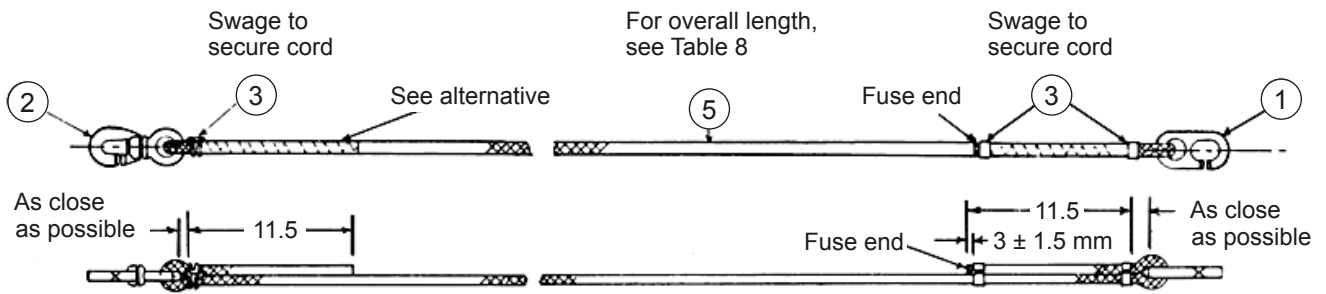


Figure 14 — Rope and clip assembly — Type 3 flags

Unless otherwise specified, dimensions are in centimetres.

Key to Figures 14 and 15	
No.	Component
1	Clip, non-swivel
2	Clip, swivel
3	Rope end
4	Toggle
5	Braided nylon

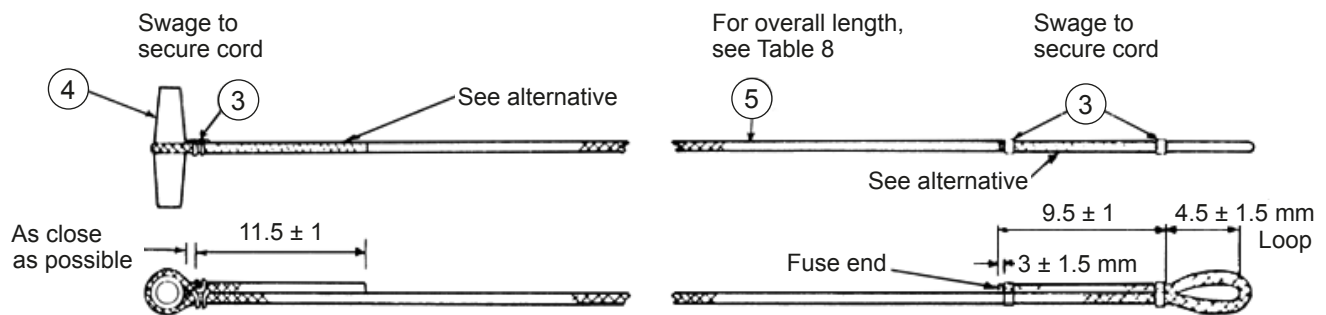
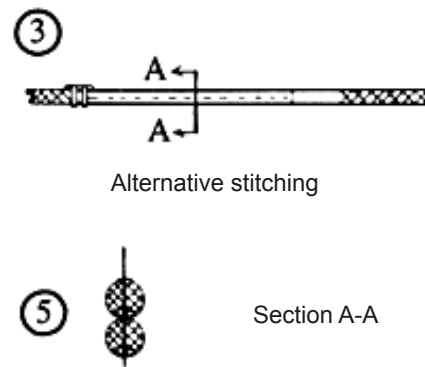
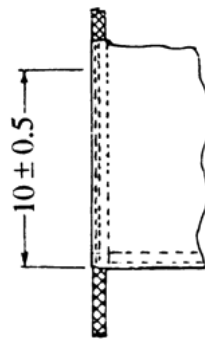
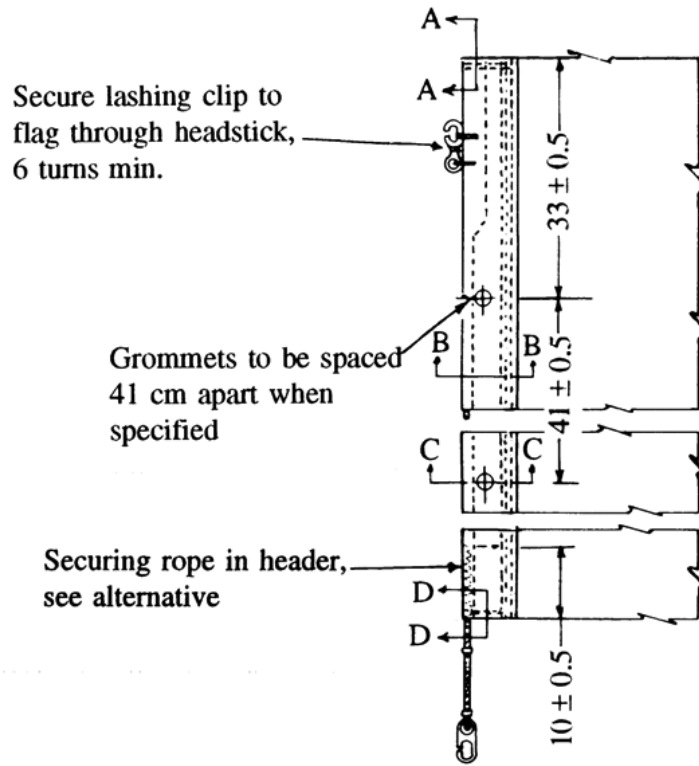


Figure 15 — Rope and toggle assembly — Type 4 flags

Unless otherwise specified, dimensions are in centimetres.



Alternative stitching
securing rope in header

Figure 16 — Header with headstick — Type 5 flags

Unless otherwise specified, dimensions are in centimetres.

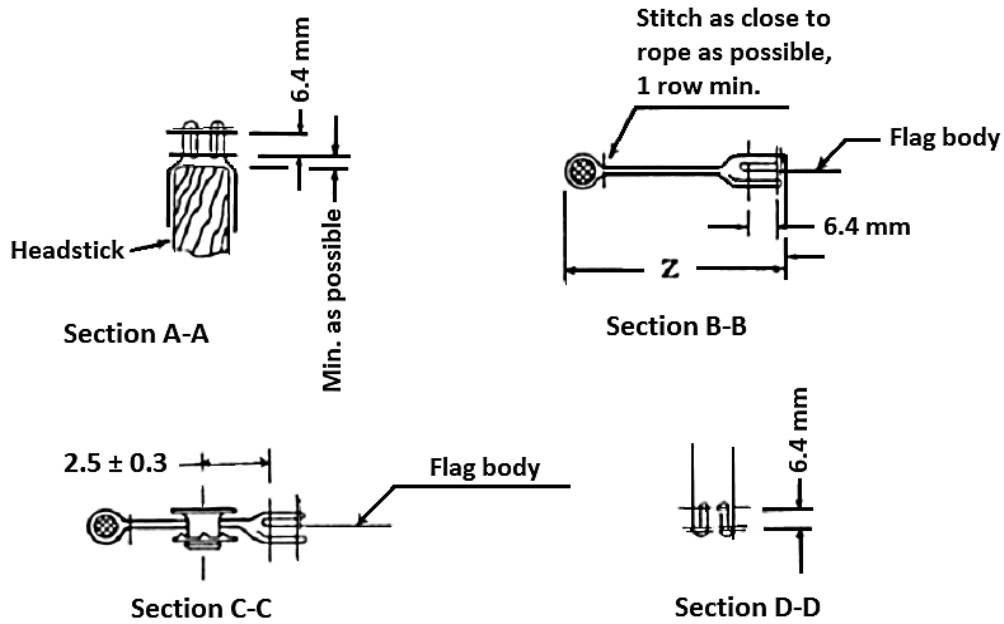


Figure 17 — Header with headstick construction details – Subtypes 5A and 5B flags

Unless otherwise specified, dimensions are in centimetres.

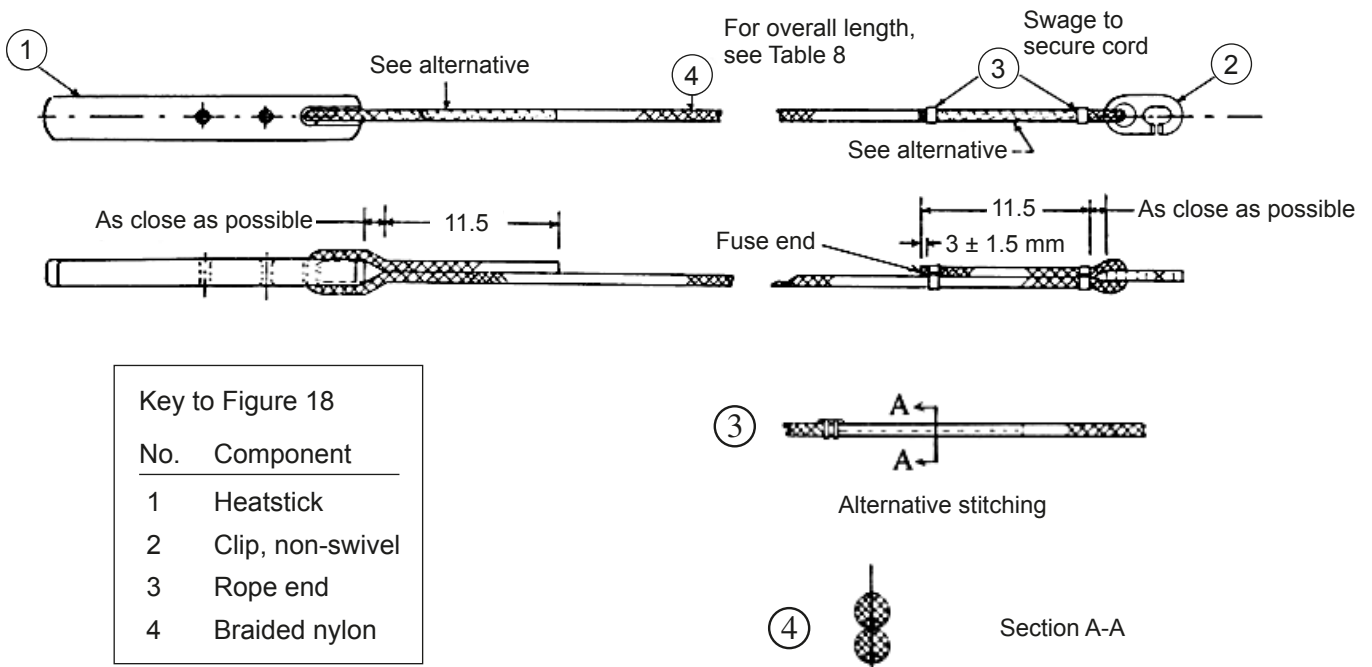
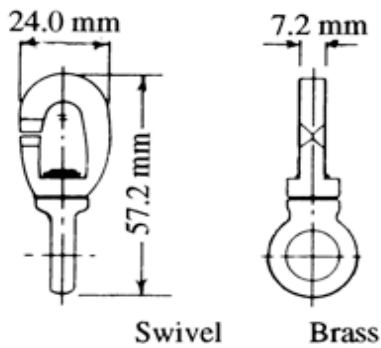
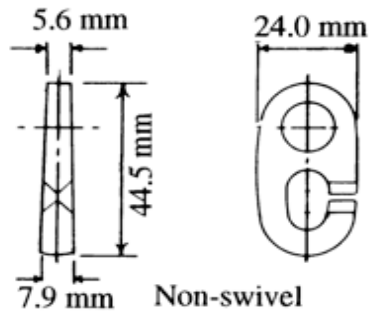


Figure 18 — Headstick assembly — Type 5 flags

Unless otherwise specified, dimensions are in centimetres.



Spur grommet no. 2 — 11.11 ± 0.4 mm inside diameter

Figure 19 — Clips — Type 3 flags

Figure 20 — Spur grommets and washers
— Types 3, 4 and 5 flags

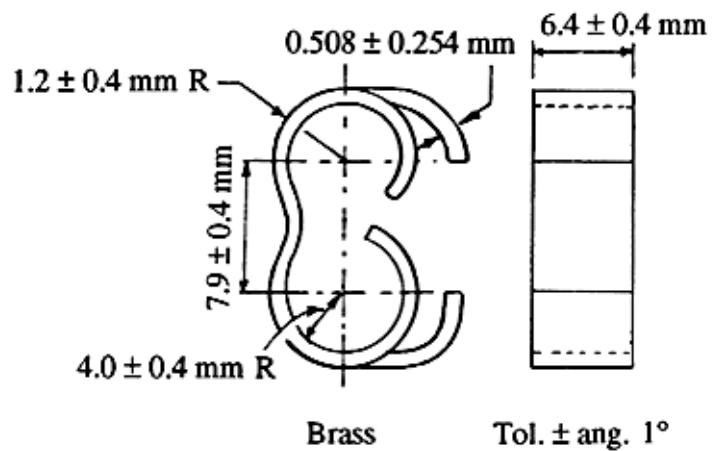


Figure 21 — Rope end — Types 3, 4 and 5 flags

Tolerance on all dimensions is ± 1.0 mm.

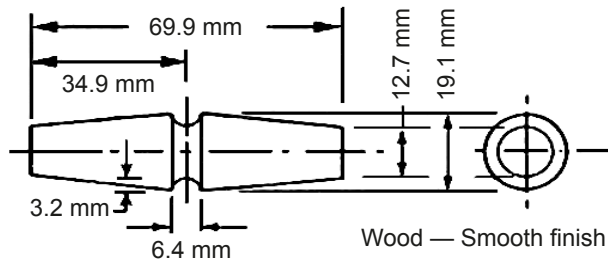


Figure 22 — Toggle — Type 4 flags

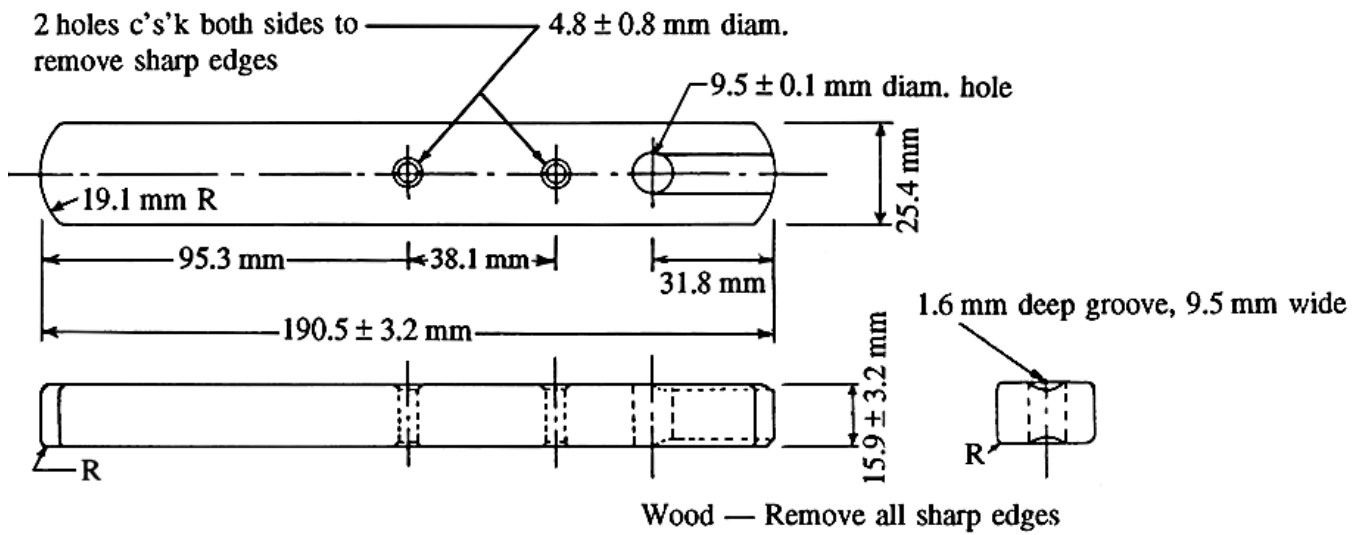


Figure 23 — Headstick — Type 5 flags

Bibliography

- [1] Canadian General Standards Board, *Canadian General Standards Board Policy and Procedures Manual for the Development and Maintenance of Standards*. Revised February 2021. Available at ncr.cgsb-ongc@tpsgc-pwgsc.gc.ca.
- [2] Department of Justice Canada, *National Flag of Canada Manufacturing Standards Act*. Available at <https://laws.justice.gc.ca/eng/acts/N-9/page-1.html>.
- [3] Government of Canada. *National Flag of Canada etiquette*. Available at <https://www.canada.ca/en/canadian-heritage/services/flag-canada-etiquette.html>.