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WITHDRAWAL

October 2017

Standards in series National Flag of Canada

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CAN/CGSB-98.1-2011

National Flag of Canada
(Outdoor use) (ICS 99.020.10)

CAN/CGSB-98.2-2011

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CAN/CGSB-98.3-M91

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National Flag of Canada (Outdoor use)

ICS 99.020.10



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National Flag of Canada (Outdoor use)

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

Prepared by the
Canadian General Standards Board 

Approved by the
Standards Council of Canada 

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National Flag of Canada (Outdoor use)

1 Scope

This standard 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 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.

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2.1 Canadian General Standards Board

CAN/CGSB-4.2 — *Textile Test Methods:*

No. 2 — *Conditioning Textile Materials for Testing*

No. 5.1 — *Unit Mass of Fabrics*

No. 9.1 — *Breaking Strength of Fabrics — Strip Method — Constant-time-to-break Principle*

No. 9.4 — *Breaking Strength of Yarns — Single Strand Method*

No. 12.1 — *Tearing Strength — Single-Rip Method*

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

No. 19.1 — *Colourfastness to Washing — Accelerated Tests — Launder-Ometer*

No. 21 — *Colourfastness to Sea Water*

No. 22 — *Colourfastness to Rubbing (Crocking)*

No. 25.1 — *Dimensional Change in Wetting*

No. 26.2/ISO 4920 — *Textile Fabrics — Determination of Resistance to Surface Wetting (Spray Test)*

No. 69 — *Weather Resistance — Xenon Arc Radiation*

4-GP-85 — *Nylon Thread (Continuous Multifilament)*

4-GP-97 — *Polyester Thread (Continuous Multifilament)*

40-GP-1 — *Methods of Sampling and Testing Cordage*

CAN/CGSB-54.1 Part 1/ISO 4915 — *Stitches and Seams — Part 1: Textiles — Stitch Types — Classification and Terminology.*

2.1.1 Source

The above may be obtained from the Canadian General Standards Board, Sales Centre, Gatineau, Canada K1A 1G6. Telephone 819-956-0425 or 1-800-665-2472. Fax 819-956-5740. E-mail ncr.cgsb-ongc@tpsgc-pwgsc.gc.ca. Web site www.ongc-cgsb.gc.ca.

2.2 American Society for Testing and Materials (ASTM)

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

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

E1331 — *Standard Test Method for Reflectance Factor and Color by Spectrophotometry using Hemispherical Geometry.*

2.2.1 Source

The above may be obtained from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, U.S.A., telephone 610-832-9585, fax 610-832-9555, or from IHS Canada, 1 Antares Drive, Suite 200, Ottawa, Ontario K2E 8C4, telephone 613-237-4250 or 1-800-387-4408, fax 613-237-4251, Web site www.global.ihs.com.

2.3 American Association of Textile Chemists and Colorists

AATCC Evaluation Procedure 6 — *Instrumental Color Measurement.*

2.3.1 Source

The above may be obtained from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709, U.S.A. Telephone 919-549-8141. Fax (919) 549-8933. Web site www.aatcc.org.

2.4 International Commission on Illumination (CIE)

CIE S 014-1/E2006 / ISO 11664-1 *Colorimetry — Part 1: CIE Standard Colorimetric Observers*

CIE S 014-2/E2006 / ISO 11664-2 *Colorimetry — Part 2 : CIE Standard Illuminants for Colorimetry*

CIE 15:2004 *Colorimetry.*

2.4.1 Source

The above may be obtained from the CIE Central Bureau, Kegelgasse 27, A-1030 Vienna, Austria. Telephone +43 1 71432870. Fax +43 1 714318718. Web site www.cie.co.at.

3 Classification

The flag shall be supplied in the following types and sizes as specified (clause 8.1).

3.1 Types

Type	Subtype	In accordance with figures
1- Header with open-sleeve	1A Integral header	6, 8
	1B Separate header	6, 9
2- Header with open-sleeve and tie tapes	2A Integral header	7, 8
	2B Separate header	7, 9
3- Header with rope and clip	3A Integral header	10, 12, 15, 21, 22, 23
	3B Separate header	10, 13, 14, 15, 21, 22, 23
4- Header with rope and toggle	4A Integral header	11, 12, 16, 22, 23, 24
	4B Separate header	11, 13, 14, 16, 22, 23, 24
5- Header with headstick	5A Integral header	17, 18, 20, 22, 23, 25
	5B Separate header	17, 19, 20, 22, 23, 25

3.2 Sizes

Size 1 — 20 x 40 cm

Size 2 — 30 x 60 cm

Size 3 — 45 x 90 cm

Size 4 — 65 x 130 cm

Size 5 — 90 x 180 cm

Size 6 — 115 x 230 cm

Size 7 — 135 x 270 cm

Size 8 — 180 x 360 cm

Size 9 — 230 x 460 cm

Size 10 — 1500 x 3000 cm.

4 General requirements

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

5 Detailed requirements

5.1 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 red maple leaf centred therein, in accordance with Figure 1.

5.2 Colours

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

Cautionary note — When conducting colour measurements and evaluating colourfastness (clause 5.3), users of this standard should be aware that the red colour may be thermochromic, i.e., may undergo rapid reversible colour change with a change in temperature. Thermochromism is a well-known property of contemporary textile dyestuffs.

5.2.1 Colour requirements

The red and white colours shall have CIE (International Commission on Illumination) colour chromaticity coordinates or equivalent CIELAB space units when calculated in accordance with ASTM E308, using Illuminant D65 and either the 1964 (10°) or 1931 (2°) Standard Colorimetric Observers, as given in Table 1, where the choice of appropriate Observer conditions follows CIE recommendations (CIE 15:2004):

- 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 1 — Equivalent chromaticity coordinates

	Chromaticity coordinates			CIELAB space units		
	<i>x</i>	<i>y</i>	<i>Y</i>	<i>L</i> *	<i>a</i> *	<i>b</i> *
Red	0.576	0.315	9.5	36.93	55.61	28.98
White	0.328	0.344	78.0	90.78	0.50	7.97

5.2.1.1 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 spectrophotometer¹ with 0°/d or d/0° geometry or with 8°/d or d/8° geometry with the specular (mirror reflection) component excluded.
- For each location, use four layers of fabric with the same face over a matte black² (Y or luminous reflectance of no more than 4%) opaque background for red and use the number of layers arrived at following the AATCC evaluation procedure for the white colour.
- 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.
- 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.

5.2.1.2 Colour tolerance

The variation from Table 1 of the averaged measurements for each colour (clause 5.2.1), calculated in accordance with ASTM D2244 and expressed in commercial factor (cf), shall be no more than 3.0 units $\Delta E_{CMC(2:1)}$.

5.2.2 Colour difference between faces

5.2.2.1 Colour measurement of the two faces of the Flag

Measurement of the difference in colour between the two faces of the flag shall be the same as in clauses 5.2.1 and 5.2.2.1, except that one layer of sample over a matte black² (Y or luminous reflectance of no more than 4%) opaque background is used during measurement of both red and white areas.

5.2.2.2 Colour tolerance between the two faces of the Flag

The variation in the white and red colours between the two faces of the flag (clause 5.2.2.1), 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.

5.3 Colourfastness

The colourfastness of the flag shall be in accordance with the requirements of Table 2. Colourfastness to seawater is optional (Table 2 and clause 8.1).

¹ A simulated D65 source should be used for polychromatic illumination.

² A test mask for colourfastness to light is available from Atlas Electric Devices Company, 4114 North Ravenswood Ave., Chicago IL 60613, U.S.A. (Ref: No. SL-8A or CD-3).

Table 2 — Finished flag fabric requirements

Property	Requirement	Test Method CAN/CGSB-4.2
Weave	Plain, 1 x 1	—
Mass, g/m ² — min. — max.	60 70	No. 5.1
Breaking strength, N, min. ^a Initial ^b — warp — weft Weathered ^c — warp — weft	725 630 400 350	No. 9.1
Tearing strength, N, min. Initial — warp — weft	22 22	No. 12.1
Dimensional change in wetting, % limit — warp — weft	2 2	No. 25.1
Colourfastness, min. to light (red and white) to washing (red and white) ^d — colour change for red portion — staining for white portion to sea water ^{g, h} — colour change for red portion — staining for white portion to crocking, dry and wet (water) ⁱ — staining (red)	L7, Grey Scale 4 Grey Scale 4 Grey Scale 4 Grey Scale 5	No. 18.3/ISO 105-B02 ^{e, f} No. 19.1, Test No. 1 No. 21 No. 22
Water resistance, min. — initial — after two launderings ^j in accordance with care labelling	100 80	No. 26.2

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

^b To satisfy clause 5.6.1, 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 must 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 (clause 8.1).

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.

5.4 Dimensions³

The flag dimensions shall be as specified in clause 3.2 and Tables 3 and 4. They shall be the averages of the following measurements:

5.4.1 Length (L)

The two outside edges and one additional horizontal measurement equally spaced across the flag.

5.4.2 Width (X)

The two outside edges and three additional vertical measurements equally spaced across the flag.

Table 3 — National flag dimensions

All dimensions are in centimetres.

Flag size ^a	Width X ^b	Length L ^b	Red Y ^b	White Z ^b
1	20 ± 0.3	40 ± 0.5	10.0 ± 0.2	20 ± 0.3
2	30 ± 0.5	60 ± 1.0	15.0 ± 0.3	30 ± 0.5
3	45 ± 0.7	90 ± 1.4	22.5 ± 0.3	45 ± 0.7
4	65 ± 1.0	130 ± 2.0	32.5 ± 0.5	65 ± 1.0
5	90 ± 1.4	180 ± 2.7	45.0 ± 0.7	90 ± 1.4
6	115 ± 1.7	230 ± 3.5	57.5 ± 0.9	115 ± 1.7
7	135 ± 2.0	270 ± 4.0	67.5 ± 1.0	135 ± 2.0
8	180 ± 2.7	360 ± 5.4	90.0 ± 1.4	180 ± 2.7
9	230 ± 3.5	460 ± 6.9	115 ± 1.7	230 ± 3.5
10	1500 ± 8.0	3000 ± 15.0	750 ± 4.0	1500 ± 8.0

^a See clause 3.2.

^b See Figures 2, 3 and 4.

³ In the case of dispute, flags shall be conditioned in accordance with CAN/CGSB-4.2 No. 2 before they are measured.

Table 4 — Header dimensions

All dimensions are in centimetres.

Flag size ^b	Header dimension W ^a cm \pm 2%	
	Type 1, 2 ^c V ^d	Type 3, 4 or 5 ^c Z ^e
1	4.0	6.5
2-10	6.5	6.5

^a See Figures 2, 3 and 4, W = V in Figures 8 and 9; W = Z in Figures 12, 13, 14, 18 and 19.^b See clause 3.2.^c See clause 3.1.^d See Figures 8 and 9.^e See Figures 12, 13 and 14 or 18 and 19.

5.5 Materials

5.5.1 Flag

The flag shall be made of woven fabric in accordance with Table 2.

5.5.2 Header

The header material shall be white fabric in accordance with Table 2.

5.5.3 Sewing thread

The flag shall be sewn with red and/or white thread in accordance with CGSB Standard 4-GP-85 or 4-GP-97, as specified (clause 8.1).

5.5.4 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/m when tested in accordance with CAN/CGSB-4.2 No. 5.1. The free length of the tie tape shall be approximately 18 cm.

5.5.5 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 5, the specimen length determination being made after 2 min under force **F**.

Table 5 — Cordage requirements

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

^a See clause 3.2.

^b When tested in accordance with 40-GP-1, Method 4.

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

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

5.5.6 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 23 or as specified (clause 8.1).

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

Spur grommets and washers shall be Type No. 2, 7.9 ± 0.4 mm inside diameter in accordance with Figure 22.

5.5.8 Clips (Type 3 only)

The clips shall be brass or yellow zinc dichromate plated steel flag clips in accordance with Figure 21 or as specified (clause 8.1).

5.5.9 Toggles (Type 4 only)

The toggles shall be in accordance with Figure 24 and shall be made from birch or maple, free of all imperfections (clause 8.1).

5.5.10 Headstick (Type 5 only)

The headstick shall be in accordance with Figure 25 and shall be made from birch or maple, free of all imperfections (clause 8.1).

5.5.11 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.

5.6 Construction

5.6.1 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.

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

- a) One-piece flag — Figures 2 and 5 (Sections A-A and B-B)
- b) Three-piece flag — Figures 3 and 5 (Sections A-A, B-B and C-C)
- c) Four-piece flag — Figures 4 and 5 (Sections A-A, B-B and C-C).

5.6.2 Stitch type

All stitching shall be lockstitch or chain stitch (Type 301 or Type 401, respectively, in accordance with CAN/CGSB-54.1, Part 1/ISO 4915) with not less than 2.5 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.

5.6.3 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 17 (according to flag type) and Table 6. They shall be inserted in the headers of size 3 through 7 flags in accordance with Table 6 when specified (clause 8.1).

Table 6 — Number of grommets

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

^a See clause 3.2.

5.6.4 Rope and clip assembly (Type 3 only)

The rope and clip assembly shall be in accordance with Figure 15 and Table 7.

5.6.5 Rope and toggle assembly (Type 4 only)

The rope and toggle assembly shall be in accordance with Figure 16 and Table 7.

5.6.6 Headstick assembly (Type 5 only)

The headstick rope and clip assembly shall be in accordance with Figure 20 and Table 7.

6 Preparation for delivery**6.1 Packaging and packing**

Unless otherwise specified (clause 8.1), packaging and packing shall conform to normal commercial practice.

6.2 Labelling

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

Mark identifying that the flag has met the requirements of CAN/CGSB-98.1

Date of manufacture

Size.

The flag shall have affixed to its package a label upon which at least the following information, 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.⁴

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

Table 7 — Rope assemblies — Length^a of rope component

Flag size ^b	Rope and clip ^c cm \pm 3%	Rope and toggle ^c cm \pm 3%	Headstick ^c cm \pm 3%
2	70	95	—
3	90	110	—
4	110	135	—
5	135	160	—
6	—	185	—
7	180	205	165
8	225	250	210
9	270	295	255

^a When measured before assembly, i.e., from cut end to cut end.

^b See clause 3.2.

^c Component No. 5 in Figures 15 and 16, Component No. 4 in Figure 20.

7 Inspection

7.1 Sampling

Sampling for inspection and testing shall be left to the discretion of the inspection authority, unless a specific sampling plan is specified (clause 8.1).

8 Notes

8.1 Options

The following options must be specified in the application of this standard:

- Types and sizes of flag (clauses 3.1 and 3.2)
- Colourfastness to seawater (clause 5.3 and Table 2)
- Colour and type of sewing thread (clause 5.5.3)
- Rope ends (clause 5.5.6)
- Clips (clause 5.5.8)
- Toggles (clause 5.5.9)
- Headstick (clause 5.5.10)
- Grommets (clause 5.6.3)
- Packaging and packing, if other than as specified (clause 6.1)
- Sampling, if a specific plan is specified (clause 7.1).

8.2 Related publications

8.2.1 Department of Canadian Heritage

Flag Etiquette in Canada, Catalogue Number CH4-1/5-2001,
<http://www.publications.gc.ca>.

8.2.2 Department of Justice Canada

National Flag of Canada Manufacturing Standards Act.,
<http://laws.justice.gc.ca>.

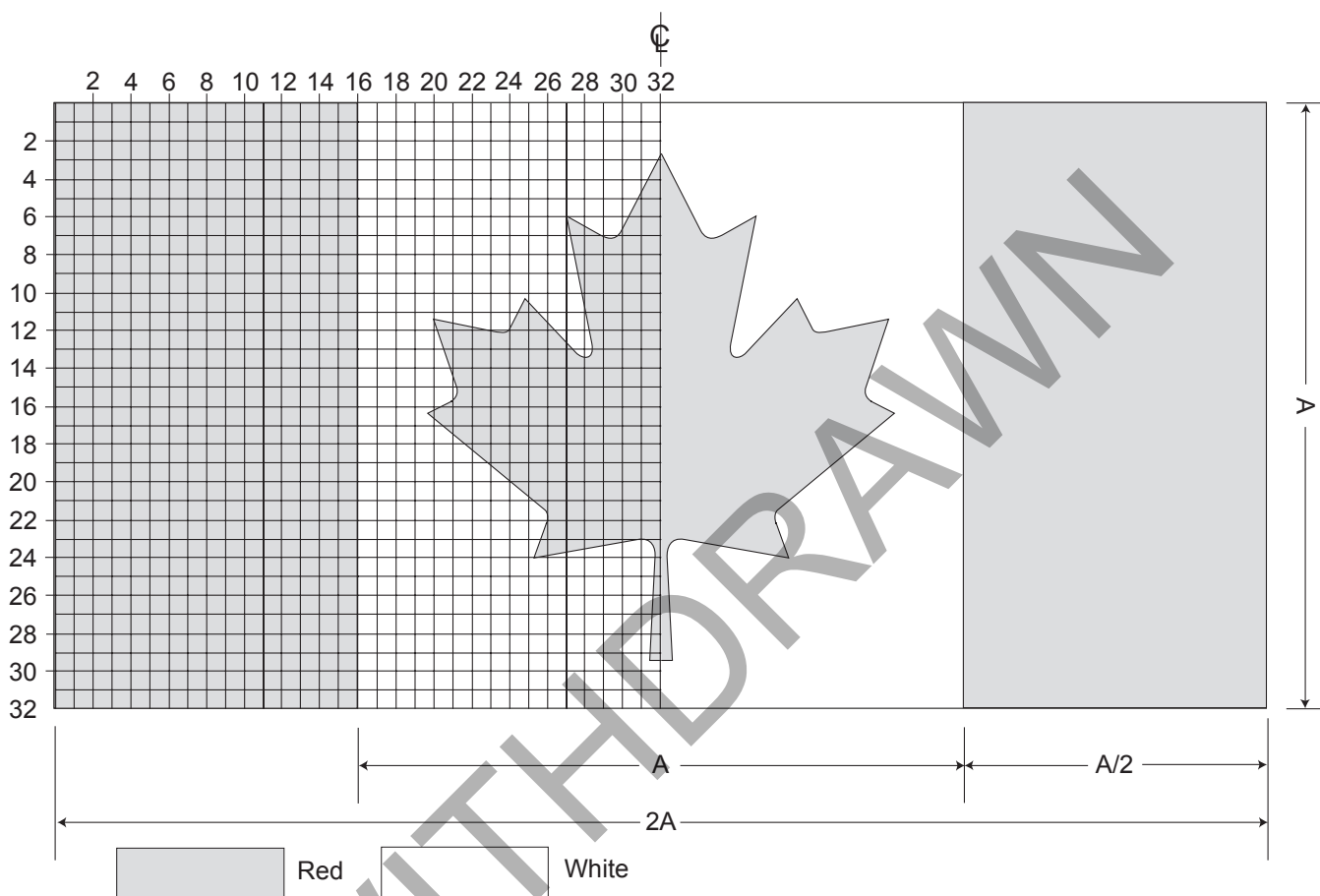


Figure 1 — Design of the National Flag of Canada

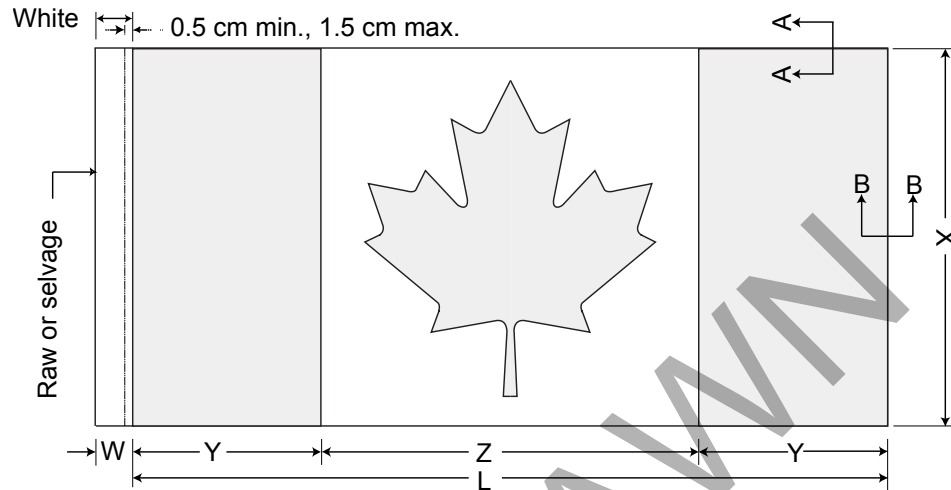


Figure 2 — One-piece flag construction
Flag sizes 1 to 7: 20 x 40 cm to 135 x 270 cm

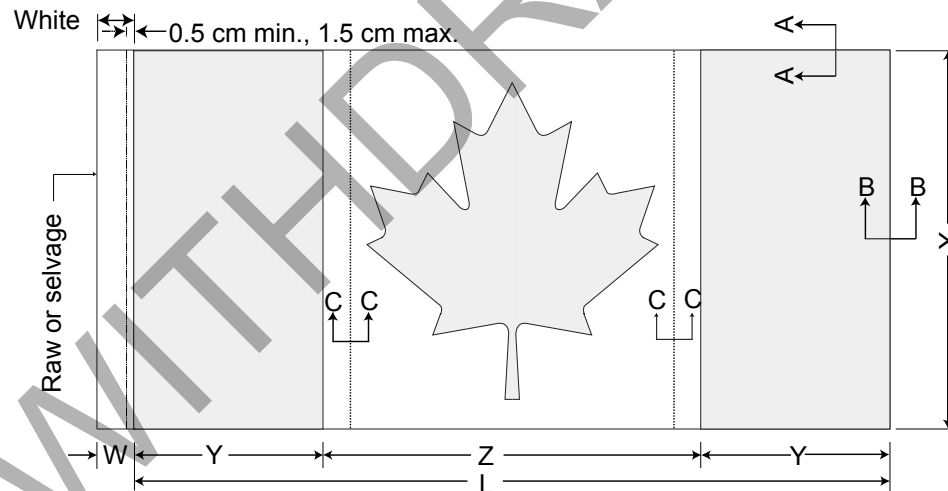


Figure 3 — Three-piece flag construction
Flag size 8: 180 x 360 cm

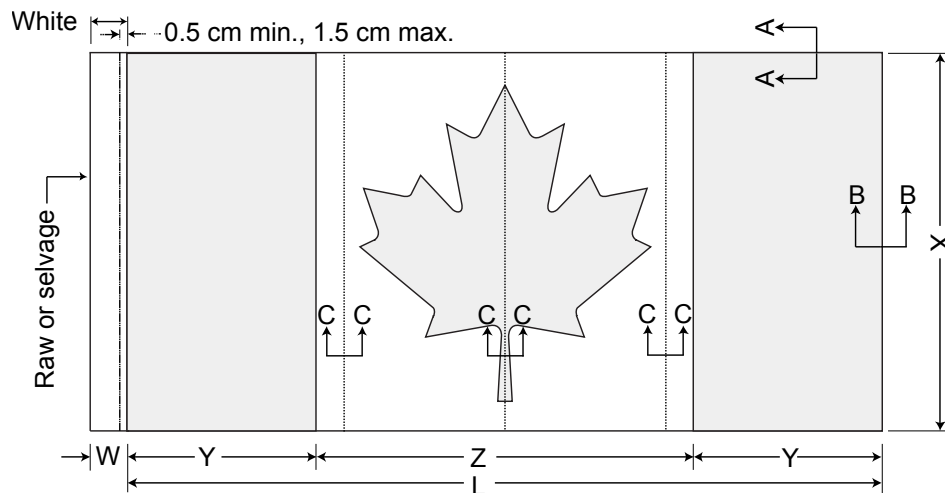
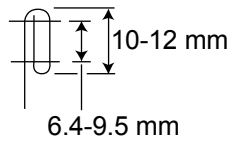
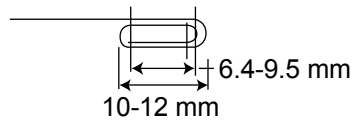


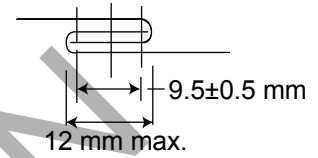
Figure 4 — Four-piece flag construction
Flag sizes 9 and 10: 230 x 460 cm to 1500 x 3000 cm



Section A-A



Section B-B



Section C-C

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

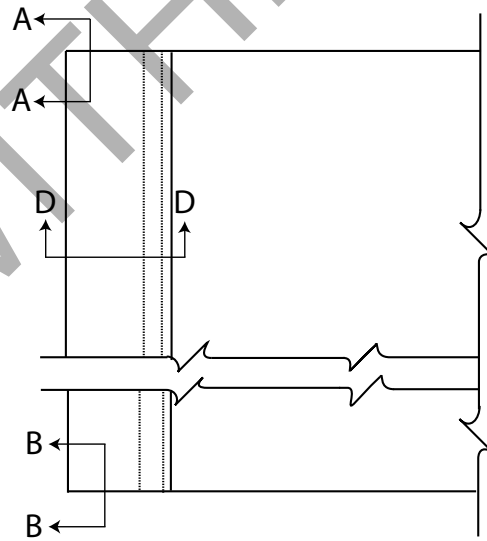


Figure 6 — Type 1 — Header, open-sleeve

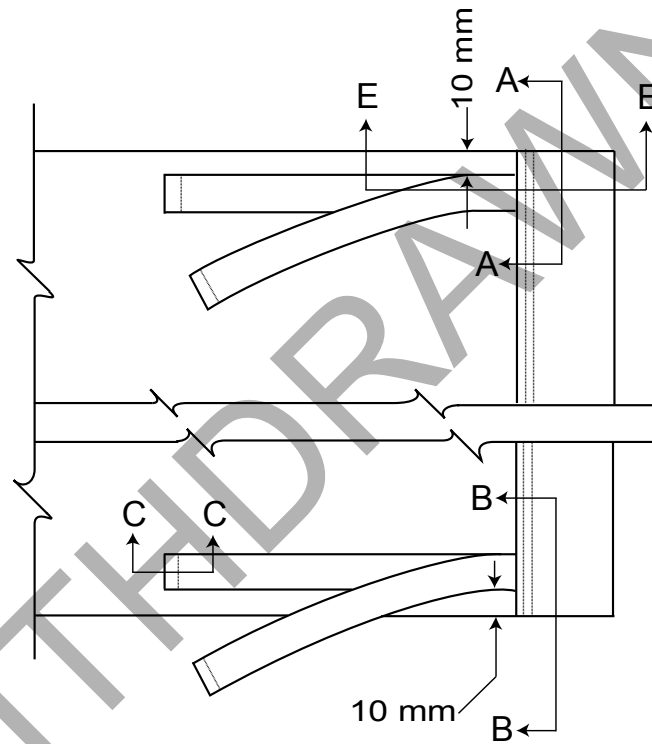
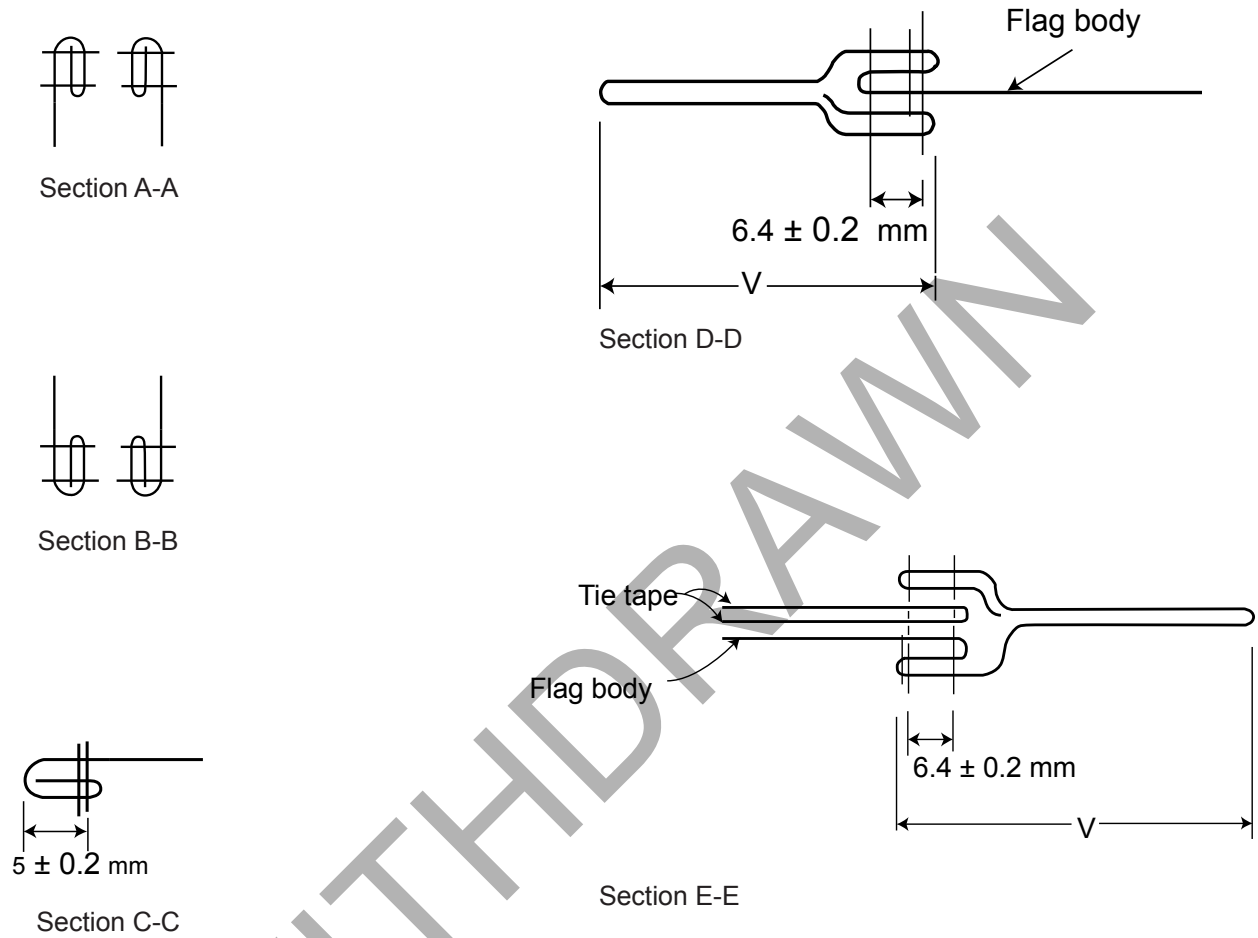


Figure 7 — Type 2 — Header, open-sleeve with tie tapes



Unless otherwise specified, dimensions are in centimetres.

Figure 8 — Construction details — Subtype 1A and 2A flags

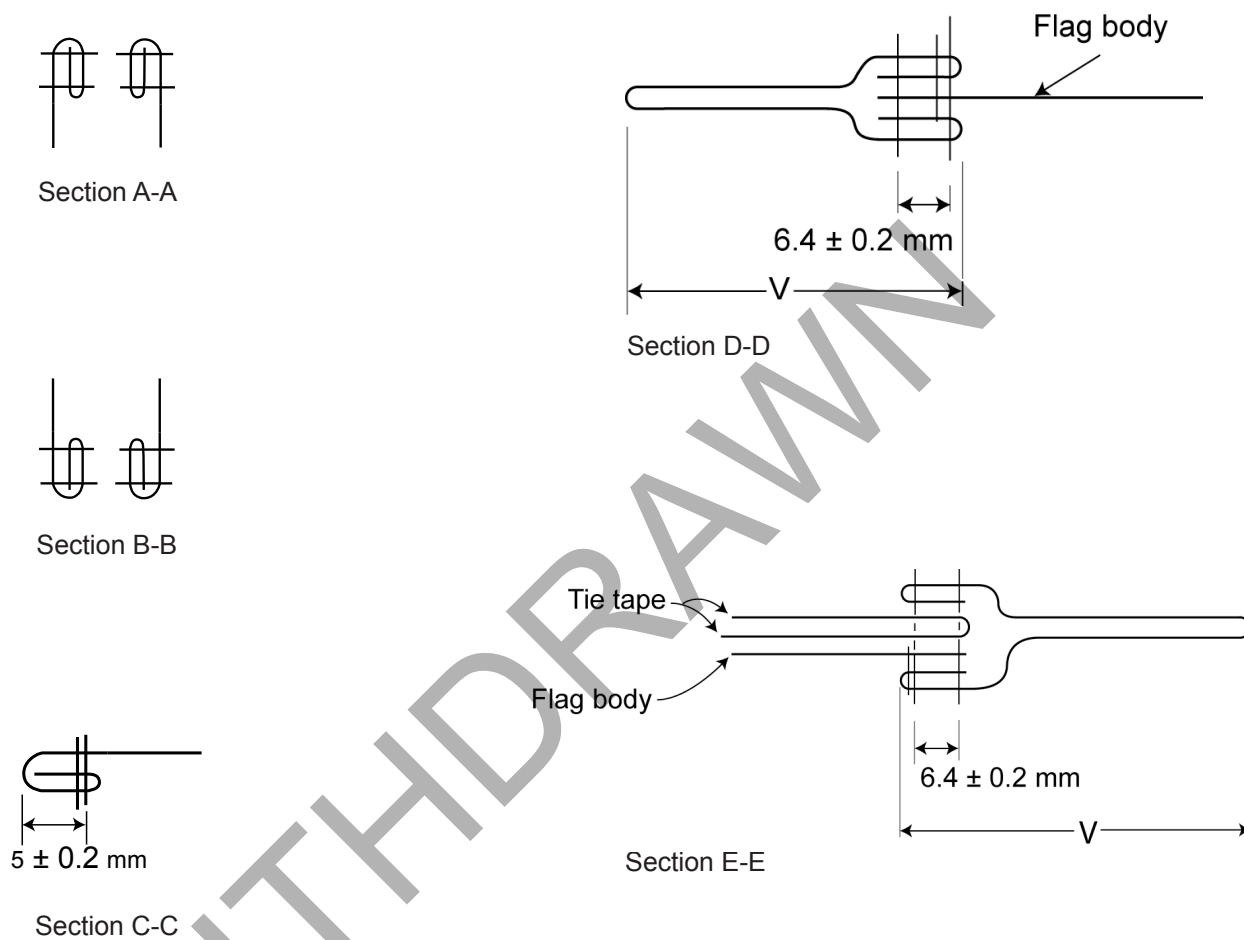


Figure 9 — Construction details — Subtype 1B and 2B flags

Unless otherwise specified, dimensions are in centimetres.

Grommets when specified to be spaced 41 cm apart

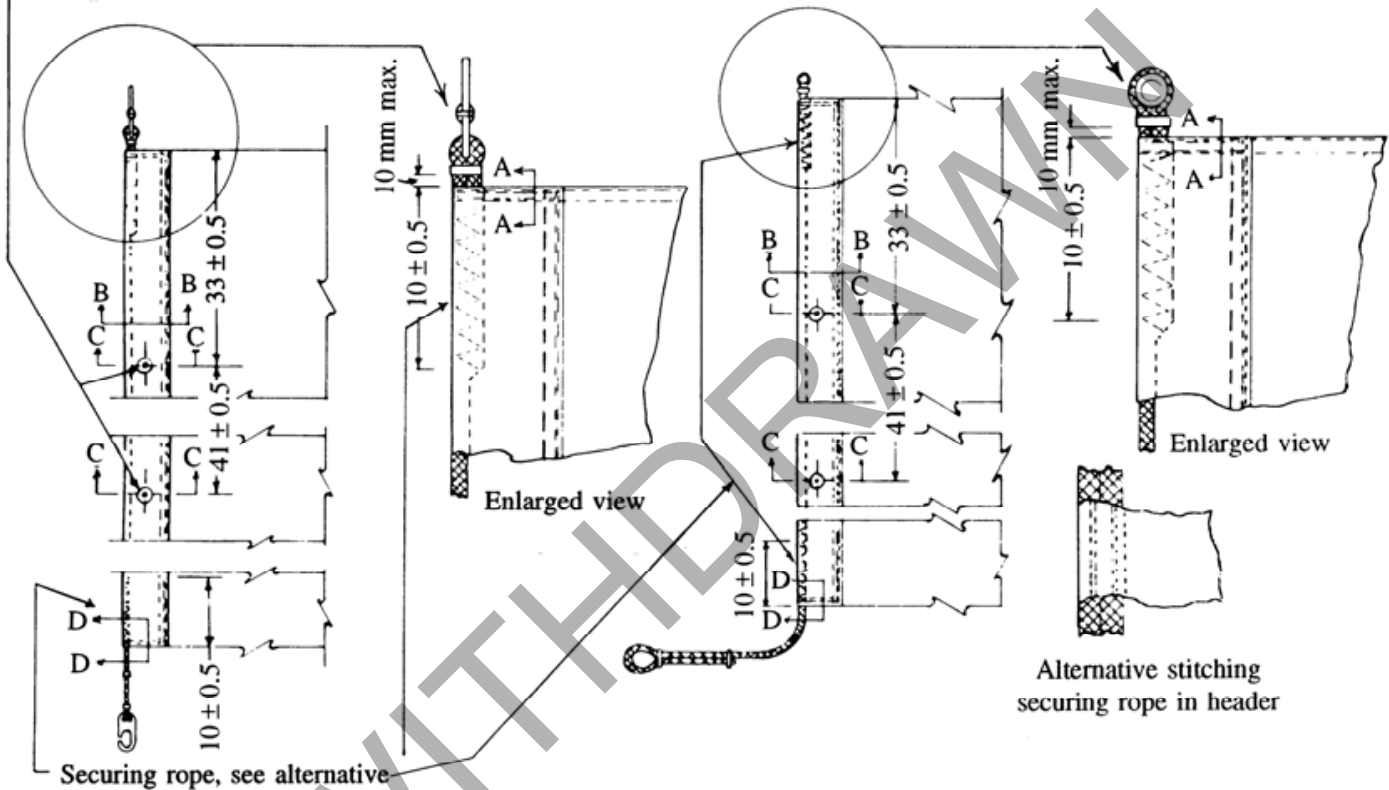


Figure 10 — Type 3 — Header with rope and clip

Figure 11 — Type 4 — Header with rope and toggle

Unless otherwise specified, dimensions are in centimetres.

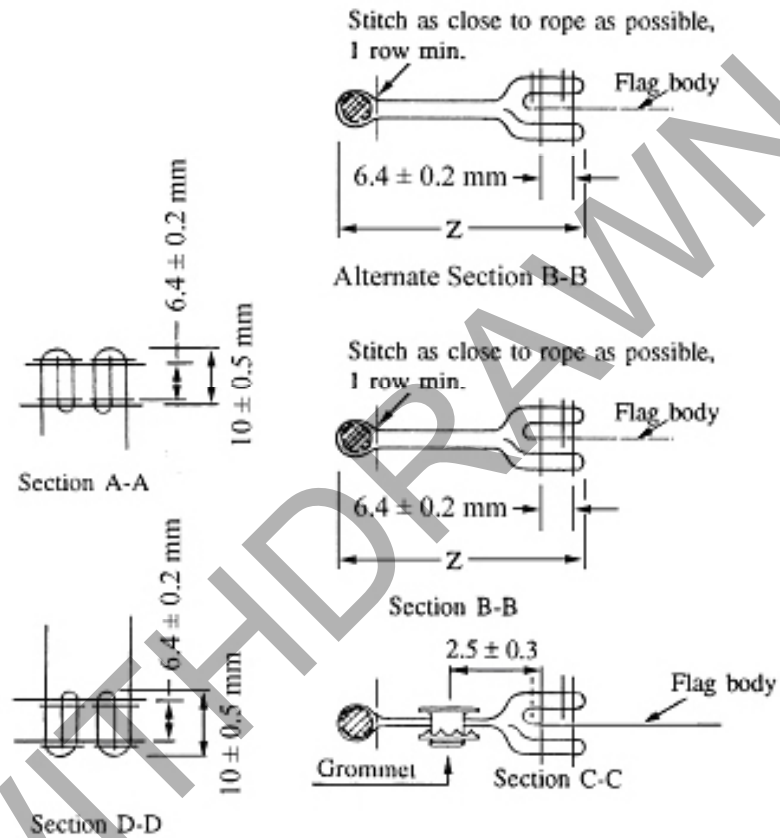


Figure 12 — Construction details — Subtype 3A and 4A flags

Unless otherwise specified, dimensions are in centimetres.

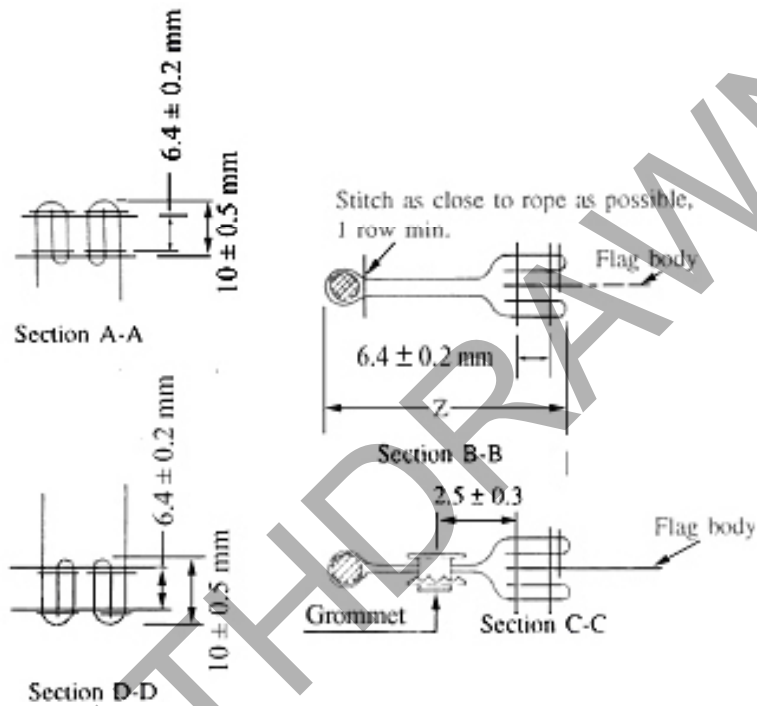


Figure 13 — Construction details — Subtype 3B and 4B flags

Unless otherwise specified, dimensions are in centimetres.

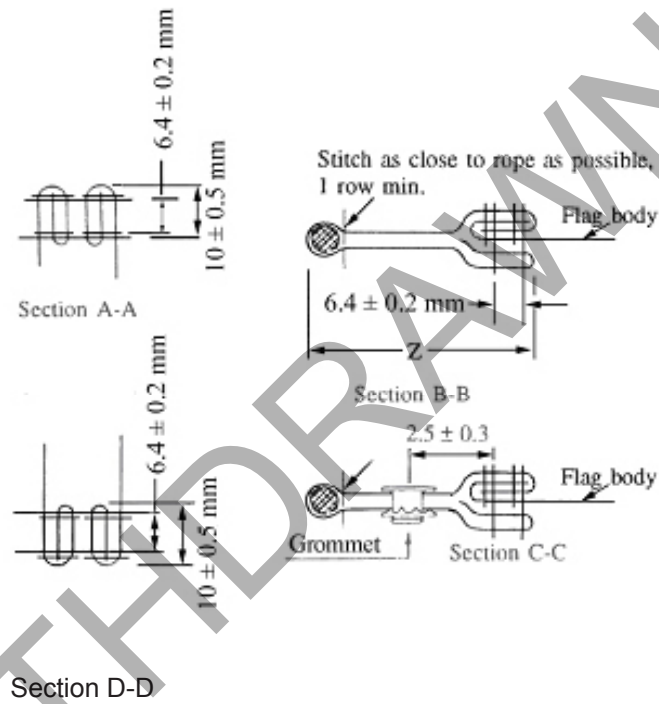


Figure 14 — Construction details — Subtype 3B and 4B flags

Unless otherwise specified, dimensions are in centimetres.

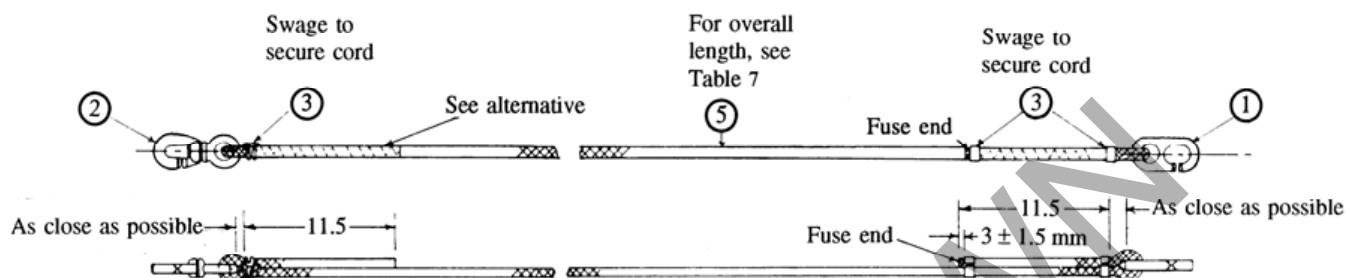
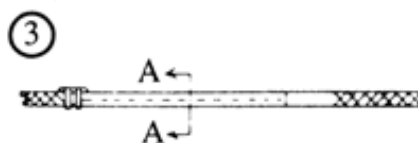


Figure 15 — Rope and clip assembly — Type 3 flags

Key to Figures 15 and 16

No.	Component
1	Clip, non-swivel
2	Clip, swivel
3	Rope end
4	Toggle
5	Braided nylon



Alternative stitching

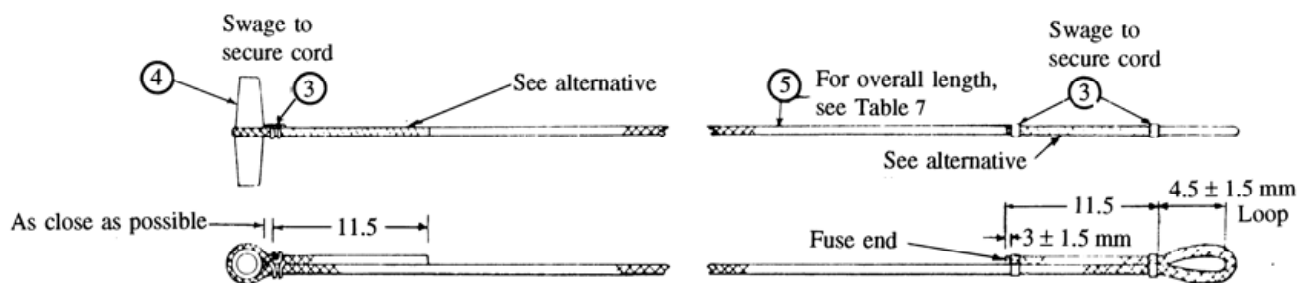
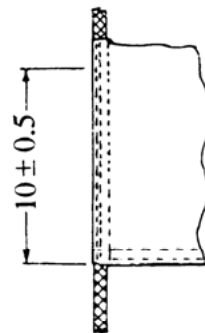
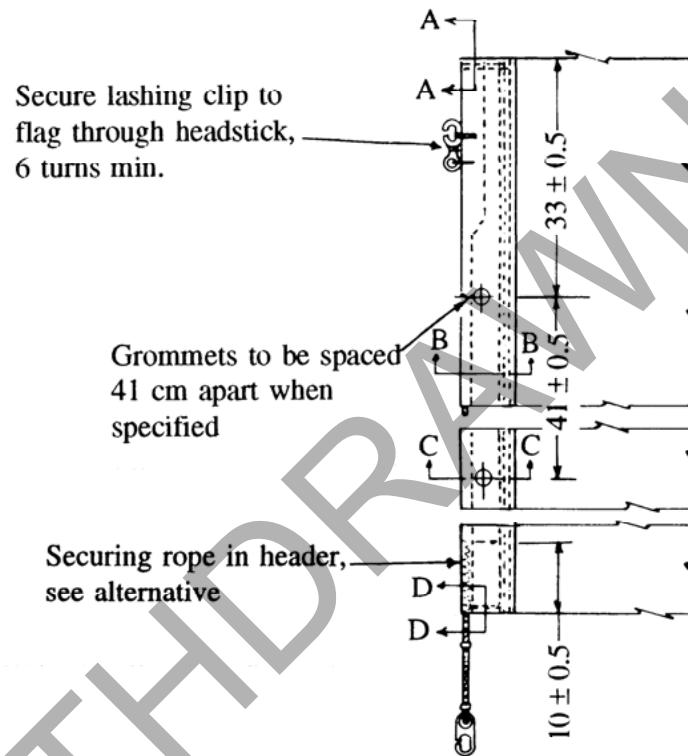


Figure 16 — Rope and clip assembly — Type 4 flags

Unless otherwise specified, dimensions are in centimetres.



Alternative stitching
securing rope in header

Figure 17 — Type 5 — Header with headstick

Unless otherwise specified, dimensions are in centimetres.

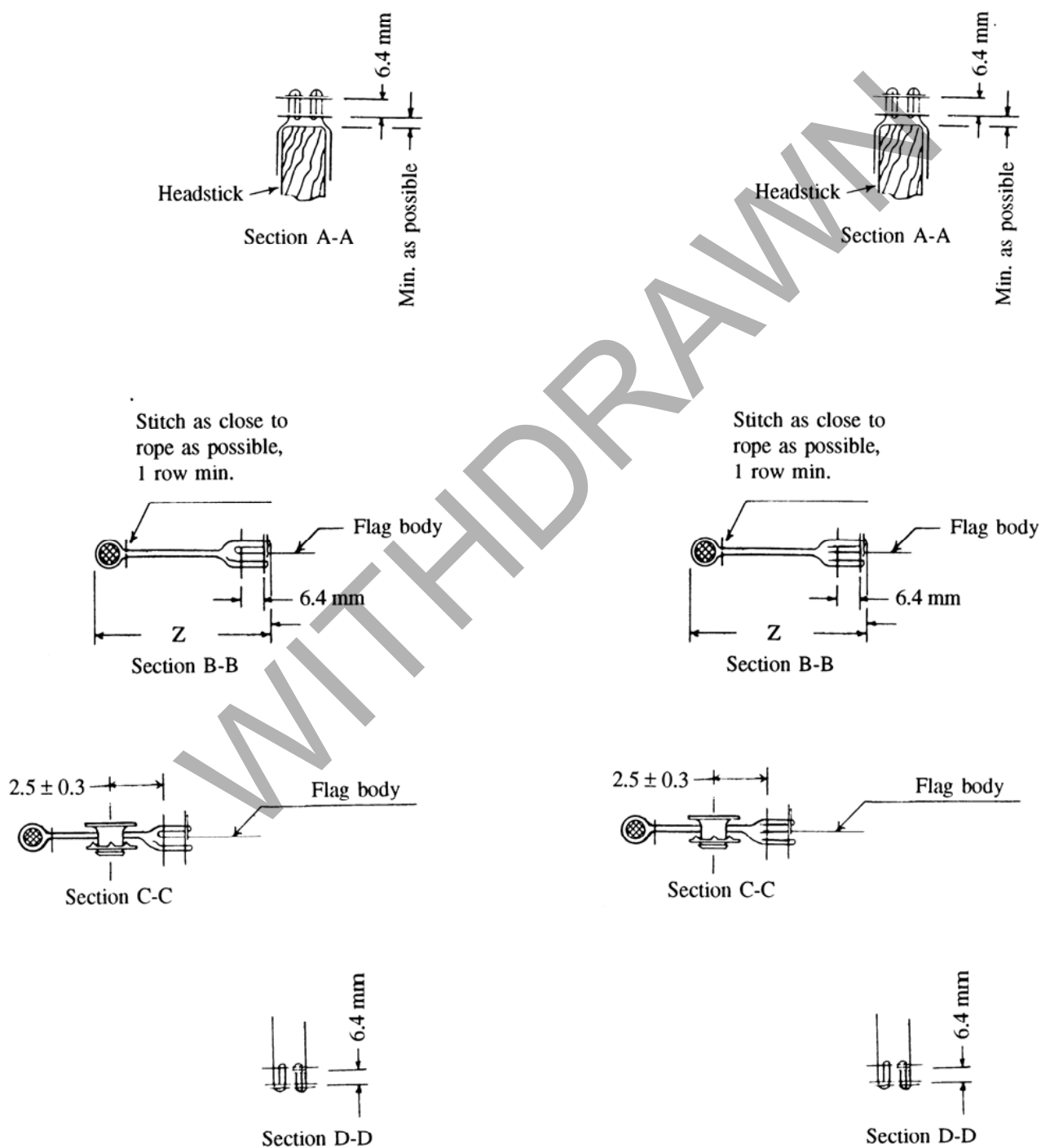


Figure 18 — Construction details — Subtype 5A flags

Figure 19 — Construction details — Subtype 5B flags

Unless otherwise specified, dimensions are in centimetres.

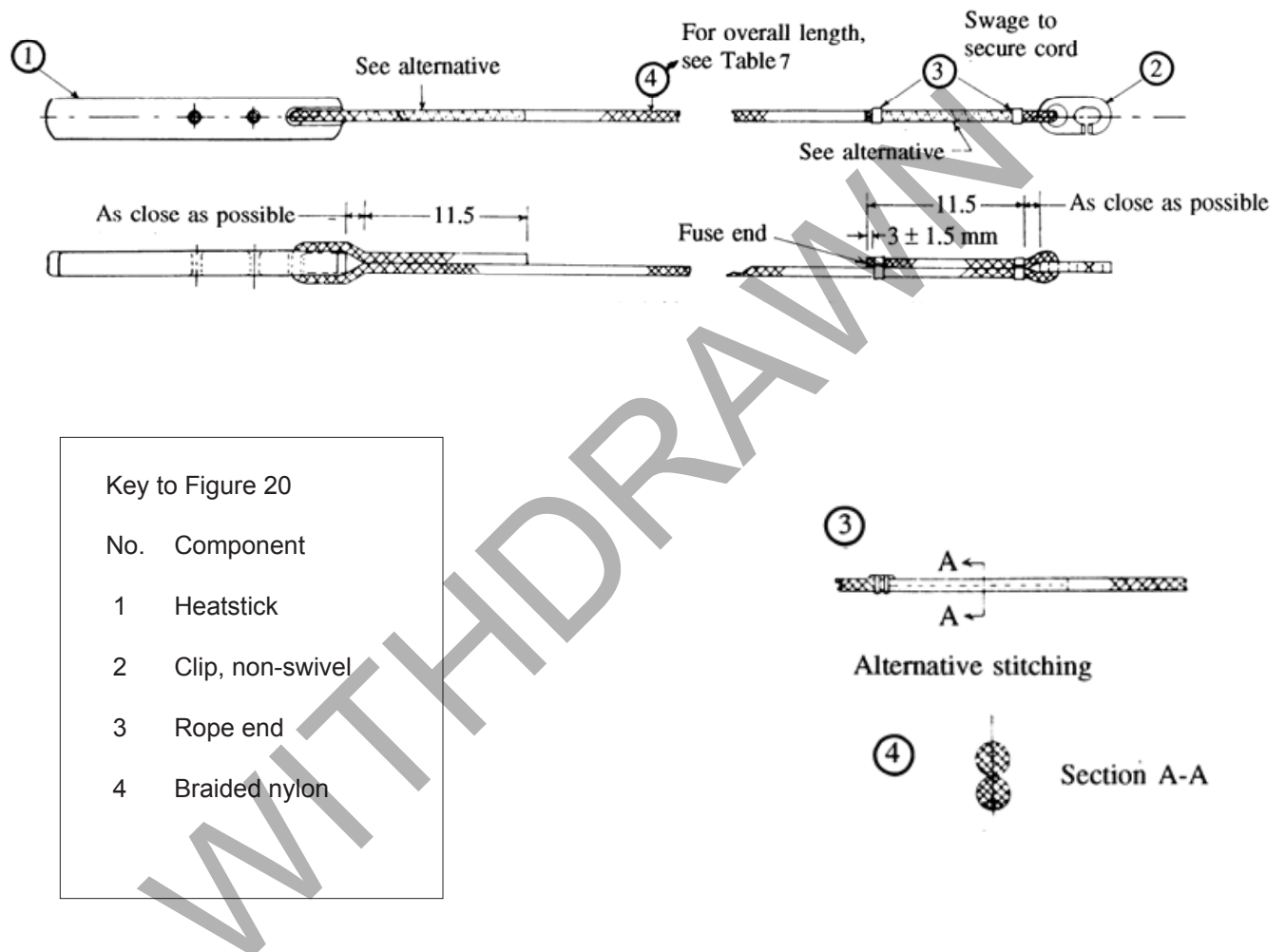
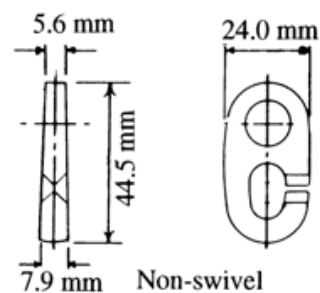
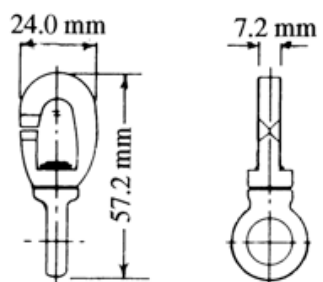


Figure 20 — Headstick assembly — Type 5 flags

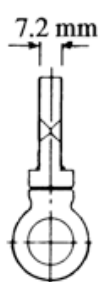
Unless otherwise specified, dimensions are in centimetres.



Non-swivel



Swivel



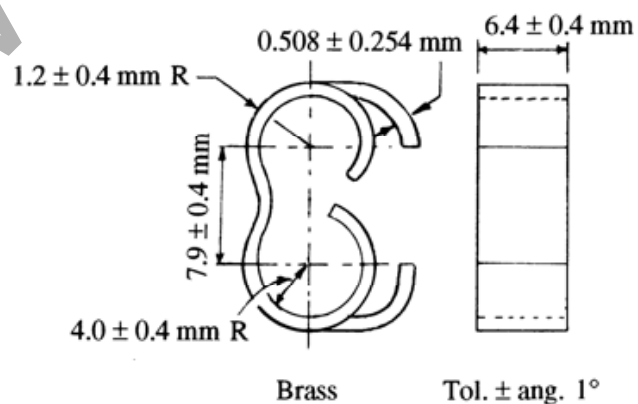
Brass

Figure 21 — Clips —
Type 3 flags



Spur grommet #2 — 7.9 ± 0.4 mm inside diam.

Figure 22 — Spur grommet —
Type 3, 4 and 5 flags



Brass

Tol. \pm ang. 1°

Figure 23 — Rope end — Type 3, 4 and 5 flags

Tolerance on all dimensions is ± 1.0 mm.

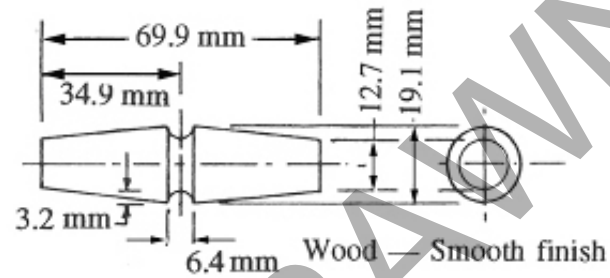


Figure 24 — Toggle — Type 4 flags

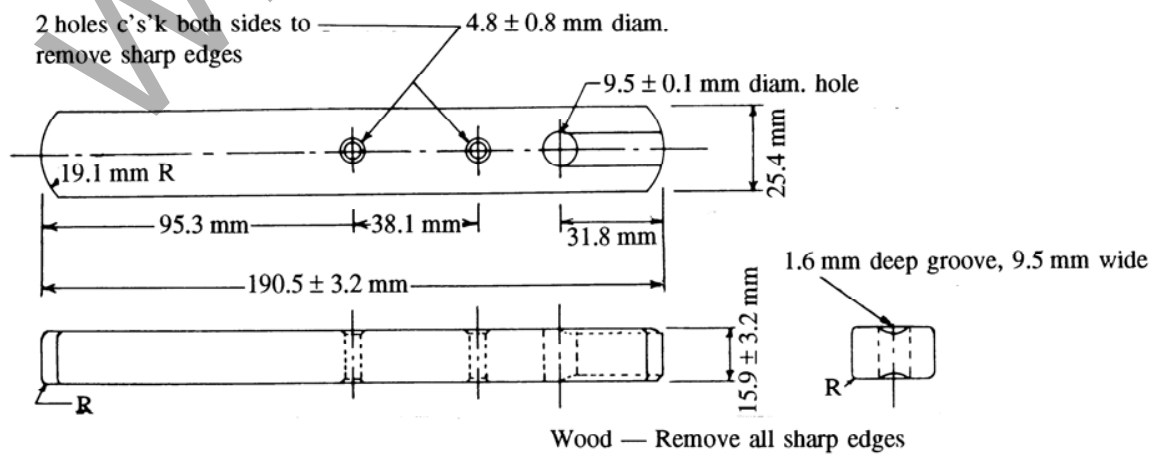


Figure 25 — Headstick — Type 5 flags