

# *Tornado Class Rules*

## **F.7 RUNNING RIGGING**

### **F.7.1 MATERIALS**

- (a) Materials are optional.

### **F.7.2 PARTS**

#### **(a) MANDATORY**

- 1) Mainsail halyard
- 2) Mainsail sheet
- 3) **Jib** halyard
- 4) **Jib** sheets
- 5) **Gennaker** halyard
- 6) **Gennaker** sheets
- 7) **Gennaker** tack line
- 8) Trapeze lines
- 9) Cunningham lines

#### **(b) OPTIONAL**

- 1) **Mast** rotation control lines
- 2) All other running **rigging** is optional.

### **F.7.3 Fittings**

- (a) **fitting** locations are optional

- (b) **fitting** materials are optional

- (c) blocks, fairleads, cleats, fittings and attachment points are optional

## **Section G – Sails**

## **G.1 PARTS**

### **G.1.1 MANDATORY**

- (a) **Mainsail**
- (b) **Jib**
- (c) **Gennaker**

## **G.2 GENERAL**

### **G.2.1 RULES**

- (a) **Sails** shall comply with the **class rules**.
- (b) The ITA will accept proposals for new sailcloth materials to be added to “Appendix A – Approved Sailcloth List” once each year.

### **G.2.2 MODIFICATIONS, MAINTENANCE AND REPAIR**

- (a) **Sails** shall not be altered in any way except as permitted by these **class rules**.
- (b) Routine maintenance, such as repairing minor tears, is permitted without re-measurement.

### **G.2.3 SAILMAKER**

- (a) No licence is required.
- (b) The sailcloth manufacturer and sailcloth type of the **body of the sail** shall be indelibly marked near the **head point** by the sailmaker, together with the date and his signature or stamp.

#### G.2.4 CERTIFICATION

- (a) An **official measurer** shall **certify** the **sails**.
- (b) An MNA may appoint one or more persons at a manufacturer to **certify** **sails** built by that manufacturer in accordance with the ISAF In-house Certification Guidelines.

#### G.2.5 SAIL ROYALTY LABEL

Sails certified after 1st January 2014 shall have permanently fixed at the tack, a class royalty label. Labels shall be purchased from the ITA and the label shall not be transferred from one sail to another.

### G.3 MAINSAIL

#### G.3.1 IDENTIFICATION

- (a) The class insignia shall conform to the dimensions and requirements as detailed in RRS Appendix G.

#### G.3.2 MATERIALS

- (a) The **body of the sail** and **secondary reinforcement** shall be of polyester **woven ply** and/or **laminated ply** listed in “Appendix A – Approved Sailcloth”.
- (b) **Primary reinforcement**, **batten pockets**, and **tabling** may be of any polyester **woven ply** and/or **laminated ply**.
- (c) **Stiffening** may be of any material, except that Aramid (Kevlar) and carbon fibre are not permitted.
- (d) **Windows** may be of any transparent polyester **ply**. The **ply** may have polyester reinforcement threads.
- (e) **Attachments** may be of any material, except that aramid (Kevlar) or other high modulus tape or rope is permitted for reinforcement only within 80mm of the **luff**.

#### G.3.3 CONSTRUCTION

- (a) The construction shall be: **Soft sail, single ply sail**.
- (b) **Sail reinforcement**
  - 1) **Primary reinforcement** is permitted within a distance of 595mm from each **sail corner**
  - 2) **Secondary reinforcement** is permitted within a distance of four times the limits prescribed for the **primary reinforcement** (2380mm) from each **sail corner**.
- (c) The **sail** may have a maximum of ten (10) **batten pockets**.
- (d) **Stiffening**
  - 1) A maximum of ten (10) battens are permitted, which
    - i) shall not be of more than 30mm in width

- ii) shall not protrude more than 100mm beyond the **leech** of the **sail**
- iii) shall have no moving parts

2) A headboard is permitted

- (e) The following are permitted: Stitching, glues, tapes, Cunningham eye and/or block, **batten pocket** patches, **batten pocket** elastic, **batten pocket** end caps, **leech** line with cleat, **sail** shape indicator stripes and items as permitted or prescribed by other applicable rules.
- (f) The **foot** shall not be convex.
- (g) The **sail** shall be loose **footed**.
- (h) The **leech** shall not extend aft of straight lines between the **batten pockets**. Any hollows in the **leech** between width measurement points shall be bridged with straight lines for measurement.
- (i) The **sail** shall have least one **window**. Additional **windows** are permitted. **Window** shape and size are optional provided that:
  - 1) One **window** shall be of a size and shape that encloses a rectangle of minimum dimensions 800mm X 300mm. When so enclosed, the rectangle shall fit below a line 1500mm from, and parallel to, the **foot**.
  - 2) The maximum height for any part of a **window** shall be a line 2000mm from, and parallel to, the **foot**.

#### G.3.4 DIMENSIONS

	minimum	maximum
<b>Luff length</b>	-	-
<b>Leech length</b>	-	8700 mm
<b>Top width</b>	-	800 mm
<b>Quarter width</b>	-	2260 mm
<b>Half width</b>	-	2000 mm
<b>Three-quarter width</b>	-	1500 mm
Extension of headboard from <b>head point</b> in any direction		220 mm
<b>Sail reinforcement</b> , measured from <b>sail corner measurement points</b>		
<b>Primary reinforcement</b>		595 mm
<b>Secondary reinforcement</b>		2380 mm
Distance from point on <b>luff</b> 1300mm below <b>head</b> to nearest point on <b>leech</b>	-	1270 mm
<b>Luff Perpendicular</b>	-	2355 mm
<b>Window safety rectangle height parallel to foot</b>	-	1500 mm
<b>Window height parallel to foot</b>	-	2000 mm

#### G.4 JIB

##### G.4.1 MATERIALS

- (a) The **body of the sail** and **secondary reinforcement** shall be of polyester **woven ply** and/or **laminated ply** listed in “Appendix A – Approved Sailcloth”.

- (b) **Primary reinforcement, batten pockets, and tabling** may be of any polyester woven ply and/or laminated ply.
- (c) **Stiffening** may be of any material, except that Aramid (Kevlar) and carbon fibre are not permitted.
- (d) **Windows** may be of any transparent polyester ply. The ply may have polyester reinforcement threads.
- (e) **Attachments** may be of any material, except that Aramid (Kevlar) or other high modulus tape or rope is permitted for reinforcement only within 80mm of the **luff**.

#### G.4.2 CONSTRUCTION

- (a) The construction shall be: **Soft sail, single ply sail**.
- (b) **Sail reinforcement**
  - 1) **Primary reinforcement** is permitted within a distance of 440mm from each **sail corner**
  - 2) **Secondary reinforcement** is permitted within a distance of four times the limits prescribed for the **primary reinforcement** (1760mm) from each **sail corner**.
  - 3) **Chaffing patches** are permitted.
- (c) The **sail** may have a maximum of three (3) **batten pockets**.
- (d) **Stiffening**
  - 1) a maximum of three (3) **battens** are permitted, which
    - i) shall not be of more than 20mm in width
    - ii) shall have no moving parts
  - 2) a corner board is permitted at the **clew**
- (e) The following are permitted: Stitching, glues, tapes, Cunningham eye and/or block, corner eyes, zips, Velcro and sleeve **luffs**, **batten pocket patches**, **batten pocket** elastic, **batten pocket** end caps, **leech** line with cleat, **sail** shape indicator stripes and items as permitted or prescribed by other applicable rules.
- (f) The **leech** shall in no place be convex.
- (g) The **sail** shall have least one **window**. Additional **windows** are permitted. **Window** shape and size are optional provided that:
  - 1) One **window** shall be of a size and shape that encloses a rectangle of minimum dimensions 400mm X 300mm. When so enclosed, the rectangle shall fit below a line 1000mm from, and parallel to, the **foot**.
  - 2) The maximum height for any part of a **window** shall be a line 1500mm from, and parallel to, the **foot**.

#### G.4.3 DIMENSIONS

	minimum	maximum
<b>Luff</b> length	-	6300 mm
<b>Luff</b> Perpendicular	-	1680 mm
<b>Foot</b> round	-	80 mm
<b>Sail</b> reinforcement, measured from <b>sail corner</b>		

measurement points		
<b>Primary reinforcement</b>		440 mm
<b>Secondary reinforcement</b>		1760 mm
<b>Window</b> safety rectangle height parallel to <b>foot</b>	-	1000 mm
<b>Window</b> height parallel to <b>foot</b>	-	1500 mm

(a) The "triangulation" method of measurement shall be used if the width of the **sail** at the **head** exceeds 50mm. For the purpose of this rule the width at the **head** shall be measured at right angles to the **luff** through the highest point of the **sail** on the **luff** to the line of the **leech** extended if necessary.

## G.5 GENNAKER

### G.5.1 MATERIALS

(a) The **body of the sail** and **secondary reinforcement** shall be of nylon or polyester **woven ply** listed in "Appendix A – Approved Sailcloth".

(b) **Primary reinforcement** and **tabling** may be of any nylon or polyester **woven ply**.

(c) **Attachments** may be of any material, except that Aramid (Kevlar) or other high modulus tape or rope is permitted for **reinforcement** only within 80mm of the **luff**.

### G.5.2 CONSTRUCTION

(a) The construction shall be: **soft sail, single ply sail**.

(b) **Primary** and **secondary reinforcement** is permitted at the **sail corners** and the recovery points.

(c) The following are permitted: Stitching, glues, tapes, corner eyes, recovery point eyes or webbing, and items as permitted or prescribed by other applicable rules.

(d) The number of recovery point eyes or webbing is optional.

### G.5.3 DIMENSIONS

	minimum	maximum
<b>Luff</b> length	-	9150 mm
<b>Leech</b> length	-	8050 mm
<b>Foot</b> length	-	4250 mm
<b>Head to Mid-foot</b>	-	8750 mm
<b>Half width</b> – as defined by ERS G.7.5(b)	-	3450 mm

## Section H – Official plans

The set of Official Plans is comprised of:

- 1b Construction details: (1 MAY 1968 amended 19 SEP 1968 and SEP 1975)
- 2b Panel offsets and deck jig: (2 APR 1968 amended 27 FEB 1968 and SEP 1975)
- 3b Details of fittings: (10 MAR 1968 amended 19 SEP 1968 and SEP 1975)
- 4a Bulkheads, rudder, and centreboard: (4 APR 1968)

- 5a Sail shape: (7 MAY 1968 amended SEP 1975)
- 6a Details of stitch and glue: (15 APR 1968 amended SEP 1975)

## **OFFICIAL TEMPLATES**

The set of Official Templates is comprised of:

1. Bow template
2. Deck camber template
3. Hull templates #s 0, 1, 2, 3.3, 4.2 and 5
4. Centreboard template; Rudder template

Effective Date: 1 January 2014

Published Date: 7 January 2014

Previous issues: 19 April 2013

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## PART III – APPENDICES

### Appendix A Approved Sailcloth LIST

<b>MAINSAIL &amp; JIB</b>			
<b>Manufacturer</b>	<b>Cloth</b>	<b>Description</b>	<b>Weight/Film</b>
ANY	Woven Polyester	Single Ply/Woven Ply	3.8 oz/NA
Bainbridge	Diax 90 & 130 LSP	Pentex Laminate	1.5 mil
Challenge	MPX 06P	Pentex Laminate	1.5 & 2.5 mil
Contender	APEN 06	Pentex Laminate	1.5 & 3.0 mil
Contender	APEN 06, 09 & 12	Pentex Laminate	1.5 mil
Contender	MAXX Pen 09 & 15	Pentex Laminate	1.75 mil
Dimension Polyant	PE 05, 10 & 15	Pentex Laminate	1.5 mil
Dimension Polyant	FLEX 8 & 13	Pentex Laminate	1.5 mil

  

<b>GENNAKER</b>			
<b>Manufacturer</b>	<b>Cloth</b>	<b>Description</b>	<b>Film</b>
Bainbridge	MP70	Nylon	N/A
Bainbridge	AIRX 650N, 700N, 720NS	Nylon	N/A
Challenge	ELITE 40, 45 & PL42	Nylon / Polyester	N/A
Contender	DYNALITE/DYNAKOTE 75	Nylon	N/A
Contender	SUPERKOTE 75, 80, & 90	Nylon	N/A
Dimension Polyant	7722 UCP	Polyester	N/A
Dimension Polyant	F50, F60, F75	Nylon	N/A

#### Sailcloth List Policies

1. Only general availability versions of the cloths will be permitted; exclusive versions for particular sail lofts will not be permitted.
2. Sailcloth manufacturers shall provide a sample of each cloth to the ITA.
3. Sailcloth manufacturers shall notify the ITA of any change in cloth production
  - a. The ITA will determine if the cloth will remain on the List
  - b. If the cloth remains on the List, a new cloth sample shall be provided to the ITA prior to its use by Tornado sail makers

#### Grandfathering

1. Until 1 January 2007, sails made of sailcloth not [ever] listed in Appendix A - Approved Sailcloth may be used as follows:
  - a. Sails measured, signed and dated prior to 1 January 2004 may be used without restriction
  - b. Sails measured, signed and dated between 1 January 2004 and 1 December 2004
    - i. and made of the following discontinued sailcloth may be used without restriction: Dimension Polyant 6611/6633 SCP and UCP 7722 SCP, or SCN 75 and 90
    - ii. and not covered by (b)(i) above, may be used except at Continental Championships, World Championships, Olympic Qualification Events, Pre-Olympic Test Events
2. Sails made of sailcloth that has been deleted from the Approved Sailcloth List are legal for use in competition without restriction, provided that: