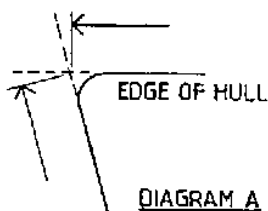


**AUSTRALIAN ARROW AND ARAFURA CADET ASSOCIATION
ARROW CATAMARAN
RESTRICTIONS AND MEASUREMENT CERTIFICATE**

NOTE: The object of these restrictions is to provide uniform specifications and restrictions for the Arrow Catamaran. They override the measurements and recommendations contained in the plans, building instructions and materials list. They are to be read to in conjunction with the Equipment Rules of Sailing, published by the International Sailing Federation. These restrictions are operative from 27 June 2019.

- 1.0 GENERAL:** to compete in an Arrow Catamaran Association Race an Arrow must comply with these restrictions. All measurements
(excluding sails) shall be noted on this Certificate.
- 2.0 PRINCIPAL DIMENSIONS:**
- 2.1 Length overall 4300 mm plus or minus 10mm.
Deck and keel measured at centreline of each hull – 1524 mm
plus or minus 6mm.
- 2.3 Forward edge of beams from aftermost point (plus or minus 6mm)
- 2.3.1 rear beam – 497 mm.
- 2.3.2 rear centreplate case beam – 1792mm.
- 2.3.3 main beam – 2286mm.
- 2.3.4. Fore-beam – 3810mm.
- 3.0 HULL DIMENSIONS:** There is a tolerance of plus or minus 6mm on the following dimensions. All dimensions are to be measured by projecting lines with straight-edges, as shown in diagram A below.
Fibreglass may be used on all corners of the hulls in which case the plus tolerance shall not exceed 7.5mm.



- 3.1 Stem:-
- 3.1.1 Length – 374mm.
- 3.1.2 Sides 184mm aft of foremost point – 341mm.
- 3.2 At forward edge of forebeam:-
- 3.2.1 Deck – 140mm.
- 3.2.2 Sides – 364mm.
- 3.2.3 Bottom – 61mm.
- 3.3 At 2950mm from aftermost point (between main and fore beams)
- 3.3.1 Deck – 288mm.
- 3.3.2 Sides – 408mm.
- 3.3.3 Bottom – 157mm.
- 3.4 At forward edge of main beam:-
- 3.4.1 Deck 344mm.
- 3.4.2 Sides 413mm.
- 3.4.3 Bottom 202mm.
- 3.5 At 1524mm from aftermost point:-
- 3.5.1 Sides – 382mm.
- 3.5.2 Bottom – 233mm.
- 3.6 At aft edge of rear beam:-
- 3.6.1 Deck 342mm.
- 3.6.2 Sides 299mm.
- 3.6.3 Bottom 208mm.
- 3.7 Aftermost point:-
- 3.7.1 Deck 305mm.
- 3.7.2 Sides 262mm.
- 3.7.3 Bottom 173mm.

- 3.8 Profile: the hull sides between restricted measurement points shall follow a fair curve. The maximum deviation from a fair curve shall be plus or minus 6mm.
- 3.9 Longitudinal deck curve between foremost and aftermost points shall not exceed 25mm nor be less than 10mm.
- 3.10 The transom is the surface to which the rudder assembly is attached.
- 3.10.1 No point on the transom shall be more than 20mm forward of the aftermost point.
- 3.11 All hull frames and the transom shall be shaped to produce flat hull sides, decks and bottoms. The surface deformation in the cross section of a hull at any point shall not exceed (width ÷ 125) or 3mm, whichever is the lesser.
- 3.12 The centre of the chain plate shall be no closer than 440mm from the centre of the main beam.
- 4.0 **WEIGHT OF HULL:** hull and beams shall be dry when weighed and include fixed fitting only. Centreplate, complete rudder assembly and all removable fittings and sheets shall be removed. **Minimum weight – 50 kg.** Weight correctors are permitted but must be bolted inside the hull to main frame in an easily accessible position (max 3kg of lead permitted).
- 5.0 HULLS:**
- 5.1 **PLYWOOD:** shall be of exterior grade, waterproof quality. Hull sides, bottoms, decks, transoms and frames shall be constructed of 3 or 5 ply timber with a minimum 4mm thickness.
- 5.2 **BEAMS:** main, rear, centreplate case, rear beam and centreplate case side beams shall be a standard aluminium extruded tube of 50mm x 38mm x 3mm minimum. Beam between centreplate case and rear beam is optional. Lightening of fore, main and rear beams is not allowed. Centreplate case rear and side beams may be lightened provided no beam has more than 50% of the aluminium removed.
- 5.3 **LOAD STRAP:** under main beam – minimum 25mm x 2mm stainless steel or 40mm x 4mm aluminium strap not less than 50mm deep. Alternatively, an 8mm diameter stainless steel rod may be used.
- 5.4 **FOREBEAM:** shall be a minimum of 25mm x 3mm aluminium extruded tube.
- 5.5 **TRAMPOLINE:** material shall only be fitted between main and rear beams and shall be either:
 (a) Sailcloth of minimum 340g per square metre OR
 (b) Multi-filament polypropylene cloth through which a size 10 sewing needle shall not pass.
 i.e. shade-cloth of 90% shade.
- 5.6 **FIBREGLASS BOTTOM CHINES:** boats built without bottom chines shall have fibreglass seams.
- 5.6.1 Interior of hull: minimum 38mm wide x 130g per square metre cloth along seams, to both sides of main and rear frames, one side of transom and fore-frame.
- 5.6.2 Outside of hull: minimum of two layers of 38mm wide by 130g per square metre cloth.
- 5.7 **NUMBER OF FRAMES:** all boats must have fore-frame, main frame and rear frame, together with three frames of minimum depth of 125mm between the main and rear frames, one of which shall support the plate case rear beam.
- 5.8 **HATCHES:** minimum requirement: - two 100mm diameter removable inspection ports in each hull.
- 5.9 **FIBREGLASS HULLS:** the hulls may be of fibreglass or composite construction provided that they conform with the exterior dimensions, number of frames and weight restrictions contained herein.
- 5.10 **HULL IDENTIFICATION**
- 5.10.1 All hulls shall be stamped with a hull identification number inside each hull. This number shall be non removable and only applied by the State measurer or delegate. This number shall be visible through the rear hatch. The number will be issued with each set of plans.
- 5.10.2 All hulls completed after 1 July 1995 shall be inspected by the State measurer or a delegated representative prior to the deck being installed. This inspection is to ensure that hulls comply with Class internal restrictions and buoyancy requirements.
- 5.10.3 Only one set of hulls shall be built from each plan and the hull number shall be stamped inside the hull as per 5.10.1. The hull and sail number shall be the same. The only exemption is where a hull is damaged and can be replaced. In the event that both hulls are written off then a new set of hulls shall be built with a new hull number.
- 6.0 MATERIALS:**
- Type of timber is optional. However, balsa wood cannot be used for frames listed in 5.7 above, internal gunwales and chines and deck support frames. Rounding of corners on all frames, chines, gunwales and inwales both internally and externally shall not exceed 4mm radius.
- 6.1 Carbon fibre or any composite material shall not be used on the mast, boom or beams.

7.0 TIMBER SIZES:

All timber sizes shall be not less than 2mm under the dimensions shown on the plan and materials list.

(Note: the 2mm tolerance is included only to cover minor errors in machining. It is stressed that timbers should be ordered to the full dimensions given, (i.e. dressed or finished sizes).

8.0 BUOYANCY: each hull shall be divided by a watertight bulkhead at frame 4 or frame 5.**9.0 CENTREPLATE:**

Maximum length shall be 1270mm including plate handle. Maximum width of blade - 257mm. Minimum thickness of the upper 381mm shall be of 24mm at point of maximum camber, then may taper in thickness toward the tip. The maximum thickness at any point shall be 42mm.

10.0 RUDDERS: the complete rudder and tiller assembly is de-restricted.**11.0 MAST:**

11.1 Maximum length shall be 6200mm including all fittings.

11.2 Section – shall be an aluminium extrusion maximum 89mm deep x 65mm wide with no added reinforcing. This does not exclude the use of diamonds or spreaders.

11.3 Rotating masts are permitted.

11.4 Tapered or stepped metal masts are not permitted.

11.5 Maximum height of mast step above top surface of centreplate case shall be 25mm.

11.6 The mast shall be stepped within 50mm of the vertical centre of the main beam.

12.0 BOOM: Shall be an aluminium extrusion with a maximum depth of 70mm.**13.0 TRAPEZE:** Only one trapeze is allowed on each side of the boat. Hiking planks are not permitted.**14.0 SAILS:**

For championship racing up to two jibs and one mainsail only shall be used in any series. If a sail is damaged beyond repair it may be replaced with the permission of the Sailing Committee. A spinnaker is not permitted. Adjustable jib luff, main luff and main foot tensioners are allowed. Minimum sailcloth weight shall be 130g per square metre, or for laminate or composite cloth the minimum weight shall be 95g per square metre. Sails shall be stamped and signed by the State Measurer each season. This shall occur at the commencement of each season except where geographical factors make this impractical.

14.1.1 MAINSAIL:

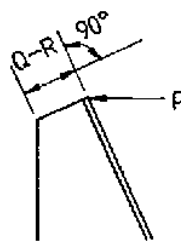
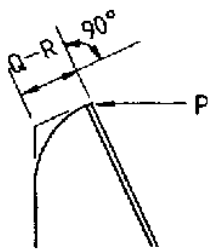
Refer to Page 5.

15.0 JIB: No headboards are permitted. Up to three battens of maximum length 305mm are allowed. Maximum measurements shall be:

15.1.1 Luff – 3683mm.

15.1.2 Leech – 3200mm.

15.1.3 Foot – 1677mm.

15.2 TOP OF SAIL: the top of the sail shall be defined as point P on the diagrams following. Point P ignores any tabs used to secure the sail. All measurements relating to luff, leech and cross measurements shall be taken from this point.

OR

15.3 HEAD WIDTH - maximum width of the head of the jib, as defined by line Q-R in the diagrams above shall be:

For sail with wire luff and eyelet - 35mm
For sail with zip luff - 50mm

15.4 CROSS MEASUREMENTS - The maximum cross measurement between the luff and leech of the jib at the following points shall be:

Measurement point on luff: (from top of sail)	Measurement point on leech:	Cross Measurement:
(a) 1841mm	(a)	1600mm
(b) 921mm	(b)	800mm
	(a)	890mm
	(b)	475mm

The cross measurements shall be determined by bridging any hollows in the leech with a straight line.

- 15.5 FOOT - The foot of the jib shall follow a fair curve between tack and clew, with a maximum foot round of 100mm.
- 15.6 LEECH - The leech of the job shall be a continuous and fair curve, with only single concave or convex curve.
The leech shall deviate no more than 20mm from a straight line between the ... measurement point (15.4.1(b)) and the top of the sail at the back of the head.
- 16.0 RIGGING:**
- 16.1 All stays shall be attached to the mast via a single hound fitting. The bearing surface of the eye in this fitting shall be 4290mm (plus or minus 50mm) from the tip of the mast base fitting and shall not extend more than 30mm from the forward surface of the mast.
- 16.1.1 POINT OF INTERSECTION OF BRIDLE – the point of intersection is the extension of the bridle wires and the forestay wire. This point shall be not further than 200mm and no shorter than 150mm from the surface of the forebeam, measured along the line of the forestay.
- 17.0 RETROSPECTIVITY:**
- 17.1 No amendment to a Restriction shall make any part of a boat or any part of its fittings illegal which was legal at the time of manufacture unless specifically stated in the amendment to the Restriction.
- 17.2 From 30 June 2012, all Arrow mainsails shall comply with Section 14 of the current Restrictions, except that any mainsail constructed prior to 30 June 2012 shall continue to be legal provided that it complies with the Restrictions dated 13 December 2010.
- 17.3 Existing sails which do not comply as a result of a Restrictions change approved after 30 June 2012 may continue to be used for up to 2 years from the date of notification of the result of the Class Vote.

AMENDMENTS:

September 1988	Cl.5.9	June 1994	Cl. 3.0, 3.7, 6.1, 14.0, 14.2, 14.4, 16.2
May 1991	Cl. 5.3	June 1995	Cl. 3.6, 3.7, 3.8, 5.9, 5.10, 14.4, 14.5, 15.4.1, 16.1
June 1991	Cl. 15	June 1997	Cl. 3.3, 3.5, 8.0, 17.2
September 2002	Cl. 14.1, 14.2, 14.2.2, 14.2.3, 14.3.1		
December 2003	Cl. 11.2, 15.5, Fibreglass hull manufacturer's statement		
August 2004	Cl. 2.1, 2.2, 2.3, 14.0		
December 2009	Cl. 5.9, Fibreglass hull manufacturer's statement deleted.		
December 2010	Cl. 2.3, 3.1.2, 3.3, 3.5, 3.7, 3.9, 3.10, 3.10.1, 12.0		
June 2012	Cl. 5.2, 14, 17.2, 17.3		
June 2015	Cl. 6.1, 9.0, 11.2, 14.1		
June 2016	Cl. 16.1		
Sept 2017	Cl. 11.2		
June 2019	Cl. 5.5		

STATEMENT BY STATE MEASURER

- 1.1 SAILS
- 1.1 I certify that Arrow Catamaran Sail No. conforms to the above Class Restrictions.
- 2.0 HULL, SPARS, RIGGING
- 2.1 I certify that Arrow Catamaran No. conforms to the above Class Restrictions.
- 2.2 I have found that Arrow Catamaran No. does not conform to the above Class Restrictions but in my opinion this is a bona fide and minor variation which does not affect the performance of the boat and I therefore approve it for Arrow Class racing. It does not conform to the following Restrictions and the variations are listed below.

Measurer's Name (print).....Signature.....Date

14.1 MAINSAIL:

Sail markings shall be in accordance with I.S.F. Rules. The sail shall carry the Class insignia as shown on the plans. The number of battens is unrestricted. The mainsail bolt-rope shall run in the track of the mast. The foot of the mainsail shall be attached to the boom at the tack and clew only (i.e. loose footed).

To measure – peg the sail out flat on the floor stretched taut but without distortion. A tension of 15kg shall be applied when measuring the luff. All measurement points on the luff and the leech shall be measured in a straight line from the uppermost part of the headboard on the luff side thereof. The head width and cross measurement shall be to a corner apex at the projection of the head and leech lines. Measurements include the bolt-rope.

There shall be no convex lines between the battens and any concave/hollow between the battens shall be bridged in a straight line between battens to measure girths. Maximum deviation from a straight line between aft head point and top $\frac{3}{4}$ girth point shall be 75mm.

The luff, Leech, Head and Foot measurements and Cross Measurements shall not exceed the maximum dimensions shown on Diagram A. The Foot shall follow a fair curve between tack and clew with a maximum round of 50mm.

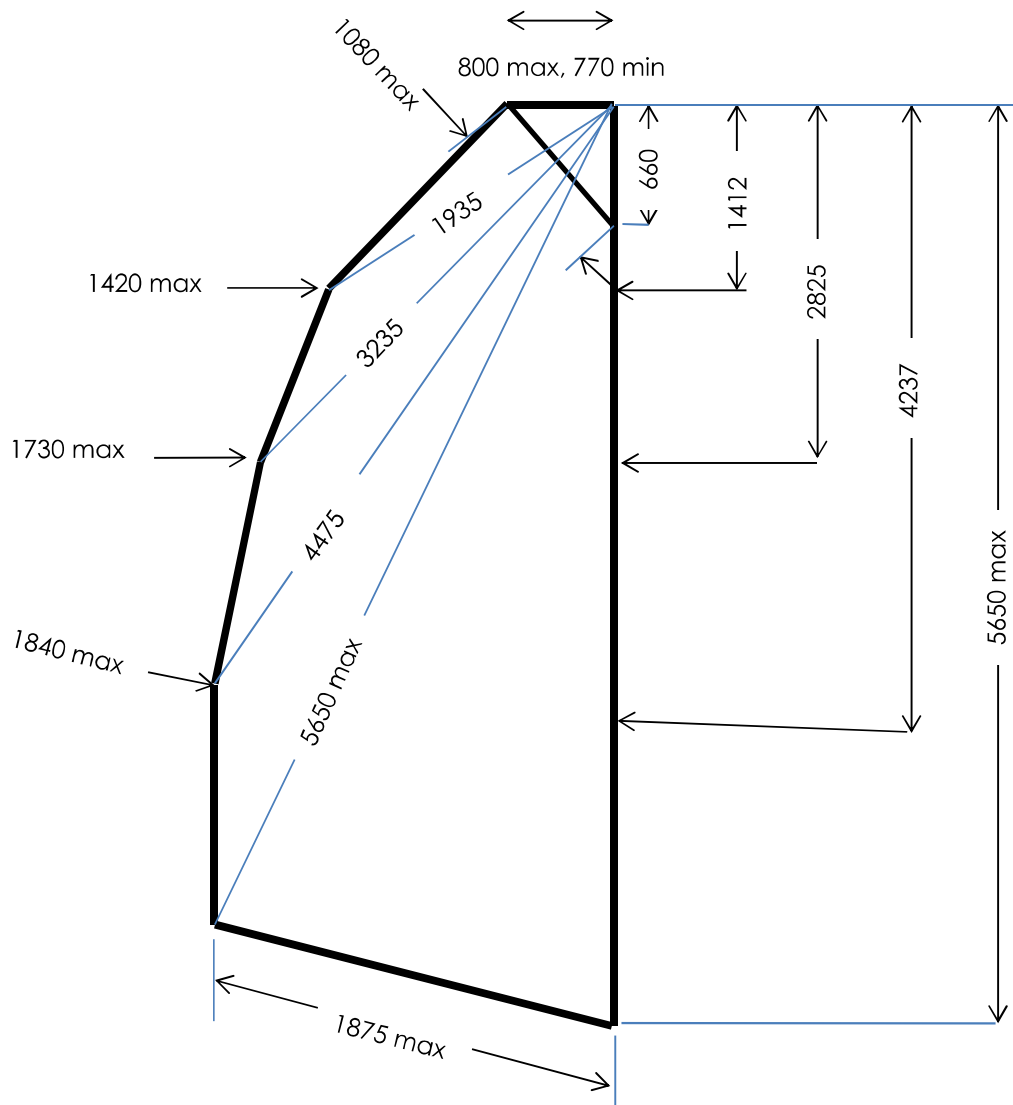


DIAGRAM A