

# AMERICA'S CUP CLASS RULE

Version 4.0

October 19, 2000

This Rule is adopted by the Challenger of Record and the  
Defender for America's Cup XXXI

  
\_\_\_\_\_ on behalf of the Defender

  
\_\_\_\_\_ on behalf of the Challenger of Record

 October 19, 2000 \_\_\_\_\_ ACC Technical Director

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## PREAMBLE

(This preamble does not form part of the **class rule**.)

The America's Cup Class is intended:

- (a) to produce wholesome day sailing monohulls of similar performance while fostering design developments that will flow through to the mainstream of yachting; and
- (b) for yachts that are raced "around the buoys" with tenders present, as opposed to off-shore in high wind and rough sea conditions with or without tenders.

This Version 4.0 of the America's Cup **Class Rule** applies to America's Cup XXXI (scheduled to be held in 2003) and supersedes all previous versions in the IACC Rule and their attendant interpretations.

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## SECTION A - GENERAL

### 1. STATUS

- 1.1 The America's Cup **Class Rule** has been established by mutual consent of the Challengers and Defender to govern the yachts for the next America's Cup match.
- 1.2 The International Sailing Federation **Racing Rules** of Sailing form part of this **Class Rule** except as altered by specific reference herein. Specific references to the **Racing Rules** are made using the 1997-2000 version of the **Racing Rules**. If later versions of the **Racing Rules** are issued by the **ISAF** prior to America's Cup XXXI the most recent version of the **Racing Rules** shall apply with the numerical references to the **Racing Rules** in this **Class Rule** altered accordingly.
- 1.3 Amendments may be made by **CORD**, with the approval of all challenge and defence syndicates.
- 1.4 This **Class Rule** shall be reviewed immediately following the next America's Cup match by a technical committee composed of representatives from challenge and defence syndicates appointed by **CORD**, and the current **technical director** who shall be chairman. Any proposed amendments shall be forwarded to the next Challenger of Record and Defender.

### 2. LANGUAGE AND DEFINITIONS

- 2.1 The official language of the America's Cup **Class Rule** is English. In questions of translation, the English text shall prevail. Except words specifically defined below, the meaning of any word shall be by reference to the Oxford English Dictionary in the context in which it appears, or if the word does not appear in the above reference the "Oxford Companion to Ships and The Sea".
- 2.2 The word "shall" is mandatory; and the words "may" and "can" are permissive.
- 2.3 Unless otherwise prescribed, the official units of measurement shall be metres and kilograms.
- 2.4 When a term defined below is used in its defined sense, it is printed in **bold** type.
- (a) "**ACC**" means the America's Cup Class.
- (b) "**Amidships**" means a transverse vertical station at 50% of LBG.
- (c) "**Appendage**" means any element outside the hull up to the **sheerline** but excludes bowsprits. **Appendage** may also include an element of an **appendage** which may extend from outside the hull into the yacht (eg. fin tower or rudder stock).
- (d) "**Ballast**" means material used to provide stability and/or measurement compliance. It would normally, have a nett specific gravity exceeding 9.0, but shall not have any materials used in the construction with a specific gravity greater than 11.4 tonnes per cubic metre.
- (e) "**Class Rule**" means the America's Cup Class rule Version 4.0.
- (f) "**CORD**" means the Challenger of Record and Defender.
- (g) "**Cure**" is deemed to be the irreversible change of properties of a thermosetting resin by the chemical reaction of ring closure (polymerisation) via linking agents.
- (h) "**Deck**" means the upper surface of the yacht above the **hull** and inside the **sheerline**, which is horizontal or near horizontal, and the transom, but excluding cockpits, recesses and troughs. For the purposes of this definition "near horizontal" means less than 45° to the horizontal.
- (i) "**FRP**" means fibre reinforced thermoset plastics.

- (j) "**Hull**" means the canoe body of the yacht up to the **sheerline** and does not include the **deck**, nor the **appendages**.
- (k) "**ISAF**" means the International Sailing Federation.
- (l) "**Measurement committee**" means the **measurement committee** appointed for a regatta in which the yacht is entered. "**CORD Measurement Committee**" means the committee appointed by **CORD** and chaired by the **CORD technical director**.
- (m) "**Measurement condition**" means the condition of the yacht as specified in **class rule 48**.
- (n) "**Owner**" means the owner (or charterer) or the owner's (or charterer's) representative.
- (o) "**Racing Rules** " means the International Sailing Federation Racing Rules of Sailing.
- (p) "**Sheerline**" means the line formed by the intersection of the **deck** and the topsides of the yacht or the intersection of the fair projection of the **deck** and the topsides of the yacht. (See also **class rule 15**).
- (q) "**technical director**" means the technical director appointed by **CORD**.

### 3. INTERPRETATION

3.1 Confidential interpretations of the **class rule** may be sought by a current challenge or defence syndicate and shall be issued as follows:

- (a) Questions of interpretation shall be submitted in writing to the **technical director**.
- (b) The **technical director** may request additional information including detailed drawings and/or technical analysis to assist in the preparation of the interpretation.
- (c) The **technical director** shall consult the other members of the **CORD Measurement Committee**.
- (d) The **technical director** may consult other parties with the approval of the individual seeking the interpretation.
- (e) As soon as possible, the **technical director** shall issue a confidential interpretation in writing to the syndicate seeking the interpretation.
- (f) The **technical director** shall distribute a copy of each interpretation to all challenge and defence syndicates and **CORD** at the earlier of:
  - (i) 12 months after the interpretation is issued; or
  - (ii) at the start of official measurement controls prior to the trials for the next America's Cup.

3.2 Public (non-confidential) interpretations may be sought by a current challenge or defence syndicate and shall be issued in accordance with **class rule 3.1** above, except that the **technical director**:

- (a) may consult other parties at his discretion; and
- (b) shall immediately distribute copies of public (non-confidential) interpretations to **CORD** and all current challenge and defence syndicates.

- 3.3 If a measurer is in doubt as to the interpretation of the **class rule**, he shall seek a confidential interpretation in accordance with **class rule** 3.1. The measurement shall be deemed incomplete until this has been done.
- 3.4 Only public (non-confidential) interpretations may be sought in matters related to the **Racing Rules** in so far as they may apply to the **class rule** as may be determined by the **technical director**.

## 4. ABBREVIATIONS

The following abbreviations are used:

ABREV.	DESCRIPTION
ABC	aft beam correction
AG	aft chain girth
AGC	aft girth correction
AGS	aft girth station
ALM	aft length mark positioned at the aft end of LBG
B	beam
BAD	height of top of boom above datum band
BP	beam penalty
CO	mainsail clew offset
D	draft
DP	draft penalty
DSP	displacement in cubic metres
E1, E2, E3, E4, & E5	mainsail girths
FBC	forward beam correction
FG	forward chain girth
FGC	forward girth correction
FGS	forward girth station
FLM	forward length mark positioned at the forward end of LBG
FP	freeboard penalty
FTA	mainsail foot triangle area
G	girth component of LM
I	height of foretriangle
J	base of foretriangle
L	rated length in metres
LBG	length between girth stations
LM	measured length
MSA	mainsail area
MWL	flotation waterline in measurement condition.
P	mainsail luff length
S	rated sail area in square metres
SF	spinnaker foot length
SLE	spinnaker leach length
SLU	spinnaker luff length
SM	measured sail area
SMG	spinnaker mid-girth
SP	spinnaker hoist height
SSA	spinnaker sail area
STP	standard atmospheric temperature and pressure
TC	core thickness
W	weight of yacht in kilograms
WP	weight penalty
$\Theta$	the mean of the angles port and starboard of the topsides measured at FGS relative to the vertical in degrees
$\Phi$	the mean of the angles port and starboard of the topsides measured at AGS relative to the vertical in degrees

5. (spare)

**SECTION B - FORMULAE**

## 6. FORMULA

The formula is

$$\frac{L + 1.25 \times \sqrt{S} - 9.8 \times \sqrt[3]{DSP}}{0.679} \leq 24.000 \text{ metres}$$

## 7. LENGTH

7.1 The length L in the formula is determined by the equation

$$L = LM \times (1 + 0.01 \times (LM - 21.2)^8) + FP + DP + WP + BP,$$

where

$$LM = LBG + G.$$

7.2 LBG shall be measured at a height of 200 mm above MWL. MWL is the plane of flotation of the yacht in sea water of 1.025 specific gravity. Both the LBG and MWL planes shall be defined forward and aft on the centreline of the **hull** as described in **class rule 47**.

7.3 G shall be determined by the formula

$$G = FGC + AGC,$$

where

(a) FGC is the greater of

$$0.3 \text{ m OR } 1.25 \times (FG - 2.4 + FBC),$$

where FG is measured around the surface of the **hull** (great circle) through FLM from points on the surface of the **hull** port and starboard in a transverse vertical plane 1.200 m above FLM; and

FBC is the greater of

$$-0.116 \text{ OR } -1.8 \times [(1 / \cos \Theta) - 1],$$

where  $\Theta$  shall be measured on the vertical transverse plane at FLM (FGS) between points 1.000 m and 1.200 m vertically above FLM; and

(b) AGC is the greater of

$$1.6 \text{ m or } 0.75 \times (AG - 1.8 + ABC),$$

where AG is measured around the surface of the **hull** (great circle) through ALM from points on the surface of the **hull**, port and starboard 0.900 m in a transverse vertical plane above ALM; and

ABC is the greater of 0 or  $1.414 - 1 / \cos \Phi$ ,

where  $\Phi$  shall be measured on the vertical transverse plane at ALM (AGS) between points 0.700 m and 0.900 m vertically above ALM.

7.4 FP, DP, WP and BP are penalties as defined in **class rules** 11 to 14 inclusive.

## 8. SAIL AREA

8.1 Sail area S in the formula shall be the sum of the measured area of the mainsail and the area of the foretriangle as corrected by the equation

$$S = SM \times (1 + 0.001 \times (\sqrt{SM} - 16.9)^8),$$

where

$$SM = MSA + (I \times J) / 2 \quad (\text{see also } \mathbf{class\ rule\ 34}).$$

8.2  $(1.25 \times \sqrt{S})$  shall not be taken as less than zero in the calculation of the formula.

## 9. DISPLACEMENT

9.1 Displacement shall be defined as the weight in kilograms of the yacht divided by 1025, i.e.,

$$DSP = W / 1025$$

9.2 The weight of the yacht shall be recorded and used in the formula rounded to the nearest 25 kilograms.

**SECTION C - LIMITATIONS AND PENALTIES**

## 10. LENGTH

- 10.1 ALM shall be on the bottom surface of the **hull**.
- 10.2 The slope of the 250 mm buttock between the aft end of the MWL plane and AGS shall not be greater than 12.5 degrees. This angle shall be measured between a horizontal plane (MWL plane) and the buttock.
- 10.3 No part of the **hull** at or below the measurement waterline plane shall extend forward of MWL or aft of ALM. Appendages, throughout their range of rotation, shall not extend forward of MWL or aft of ALM.

## 11. FREEBOARD

- 11.1 In **measurement condition** the yacht shall have the following minimum freeboards measured to the **sheerline**:
- |     |                               |          |
|-----|-------------------------------|----------|
| (a) | Minimum Freeboard at FLM:     | 1.500 m. |
| (b) | Minimum Freeboard at 50% LBG: | 1.250 m. |
| (c) | Minimum Freeboard at ALM:     | 1.200 m. |
- 11.2 If at any freeboard station the mean freeboard is less than the permitted minimum then these deficiencies shall be summed such that:
- FP = 4 x (sum of freeboard deficiencies).
- 11.3 FP shall be added to L in the calculation of the rated length. If there are no freeboard deficiencies, then FP = 0.
12. DRAFT
- 12.1 In **measurement condition** the maximum draft without penalty shall be 4.000 m.
- 12.2 If the yacht's draft exceeds 4.000 m, then DP is added to L in the calculation of the rated length as follows:
- |     |                                   |
|-----|-----------------------------------|
| (a) | DP = 4 x ( D - 4.000 ) metres.    |
| (b) | If D <= 4.000 metres then DP = 0. |
- 12.3 Lifting **appendages** are permitted but shall be fixed in their **measurement condition** while racing.

### 13. MAXIMUM AND MINIMUM WEIGHT

13.1 The yacht's weight in **measurement condition** shall not be less than 16000 kg nor greater than 25000 kg without penalty.

13.2 If the yacht's weight is less than or greater than that required by **class rule** 13.1, then WP shall be added to L in the calculation of the rated length:

(a) When the yacht's weight is less than 16000 kg, then

$$WP = 4 \times [25.198 - (\text{cube root of yacht's weight in kgs})].$$

(b) When the yacht's weight is greater than 25000 kg, then

$$WP = 4 \times [(\text{cube root of yacht's weight in kgs}) - 29.240].$$

(c) When the yacht's weight exceeds 16000 kg and is less than 25000 kg then WP = 0.

13.3 The immersed volume of the **hull** shall not be less than 80% of the immersed volume of the complete yacht in **measurement condition**.

### 14. BEAM

14.1 Maximum overall beam, without penalty, shall be 5.500 m. The beam of the yacht shall be measured between verticals at each side of the yacht set up in a transverse plane perpendicular to the yacht's centreline.

14.2 When the yacht's beam exceeds 5.500 m, then BP shall be added to L in the calculation of the rated length as follows:

(a)  $BP = 4 \times (B - 5.500) \text{ m.}$

(b) If  $B \leq 5.500 \text{ m}$  then  $BP = 0.$

14.3 The maximum beam of any **appendage** below the hull shall not exceed the local beam of the yacht vertically above that **appendage** (in any position) when the yacht is in measurement trim.

14.4 The maximum beam includes any part of the yacht's standing rigging, mast or mast support devices but does not include the spinnaker pole or reaching strut.

### 15. SHEER AND SHEERLINE

15.1 The **sheerline**, for measurement purposes, shall be the intersection in any transverse section of the fair extension of **deck** and **hull**. The fair extension of the **hull** shall be tangential from a point 100 mm below the **sheerline**. With the exception of the **hull** to **deck** joint as described in **class rule** 15.2, tumblehome is not permitted.

15.2 The **hull-deck** joint may be of any shape in the transverse vertical plane within 100 mm inboard of the maximum local beam at this section and 100 mm below the adjacent **deck** except it shall not fall outside the **sheerline**.

- 15.3 The **sheerline** in elevation of the yacht between the point 200 mm aft of the foremost point of the **hull** and AGS shall be a fair continuous concave curve whose minimum radius of curvature shall not be less than 20.000 m at any point.
- 15.4 The minimum longitudinal radius of curvature of a line 100 mm below the **sheerline** in plan view from a point 200 mm aft of the forwardmost point of the **hull** to AGS shall be 20.000 m at any point.
- 15.5 Forward of a point 200 mm aft of the foremost point on the **hull** the **sheerline** and associated stem profile or stem in plan may be any shape.
- 15.6 Aft of AGS the **sheerline** may be any shape.
16. HOLLWS
- 16.1 Hollows in the surface of the **hull** below a point 100 mm below the **sheerline** are prohibited except:
- (a) in association with an **appendage**:
    - (i) from the forward end of the MWL to a point at 0.25 LBG, hollows may extend transversely 125 mm each side of the centreline; and
    - (ii) aft of 0.25 LBG to the aft end of LBG, hollows may extend transversely 250 mm each side of the centreline:
  - (b) the yacht may be any shape below the bottom of the **hull**, provided the shape complies with **class rules** 10 and 14.3:
  - (c) minor hollows which do not occur at measurement points and which do not exceed 1 mm in depth in a length of 1.0m, or 3 mm in any length: and
  - (d) hollows associated with specific legitimate fittings. Examples of these fittings are self bailers, bobstay fittings, and spinnaker pole downhaul exit fittings.
17. (spare)

## SECTION D - CONSTRUCTION

### 18. HULL, DECK AND INTERNAL STRUCTURE

- 18.1 The **owner** shall be responsible for the structural integrity of the yacht. Compliance with the following requirements does not in any way relieve the **owner** from ensuring the yacht is of adequate strength.
- 18.2 The **owner**, designers and builders of the **hull, deck** and internal structure shall provide to the **technical director** a signed declaration similar to that shown in Appendix C confirming the **hull, deck** and internal structure have been constructed from materials and using methods permitted by **class rule 18**.
- 18.3 This construction section of the **class rule** is intended only to define minimum shell/skin thicknesses and weights per unit area. It is envisaged that internal framing will be required to support the induced sailing and other loads imposed on the yacht. No scantlings are given for this framing and it is left to the **owner** to ensure the yacht is adequately framed to meet all structural requirements.
- 18.4 The **hull** and/or **deck** shall not be artificially loaded or deformed by any device or any force other than loads and deflections imposed by the sea or rigging.
- 18.5 The **hull** and **deck** structure, cockpits, recesses and troughs, but excluding internal structure, shall only be made from sandwich structures with skin and core materials complying with the following criteria:

- (a) Skin materials shall be either any species of wood, or fibre reinforced thermoset materials provided the fibre modulus does not exceed 250 GPa.

Position	Skin	Minimum weight per m <sup>2</sup>	Minimum Thickness
<b>Hull</b> Shell below LBG Plane	Outside	2.90 kg/m <sup>2</sup>	1.90 mm
	Inside	1.80 kg/m <sup>2</sup>	1.10 mm
<b>Hull</b> Shell above LBG Plane	Outside	2.30 kg/m <sup>2</sup>	1.50 mm
	Inside	1.40 kg/m <sup>2</sup>	0.90 mm
<b>Deck</b> shell, cockpits recesses and troughs	Outside	1.90 kg/m <sup>2</sup>	1.20 mm
	Inside	1.40 kg/m <sup>2</sup>	0.90 mm

The skin weights per unit area and skin thicknesses specified shall not include core adhesive and filling or fairing. The removal of any core adhesive, filling and fairing for the purposes of determining compliance with this rule shall be carried out as specified by the measurer. The weight, rounded to two decimal places shall be determined from samples of approximately 50 mm in diameter.

- (b) Core materials shall comply with the following criteria:

Area	Minimum Thickness	Maximum Thickness	Minimum Density
<b>Hull</b> below LBG Plane Fwd of <b>Amidships</b>	29 mm	51 mm	72 kg/m <sup>3</sup>
Rest of <b>Hull</b> Shell	29 mm	51 mm	57 kg/m <sup>3</sup>
<b>Deck</b> , cockpits, recesses and troughs	14 mm	36 mm	43 kg/m <sup>3</sup>

- (c) The following weights per square metre (rounded to the nearest one decimal place) for the shell laminate including skins, core bonding compound and core shall be observed as absolute minimums. This shell weight per unit area shall not include paint or fairing compound.

Position	Minimum weight in kgs per m <sup>2</sup>
<b>Hull</b> Shell below LBG Plane forward of <b>Amidships</b>	$5.1 + 0.072 \times TC \text{ kg/m}^2$
<b>Hull</b> Shell below LBG Plane aft of <b>Amidships</b>	$5.1 + 0.057 \times TC \text{ kg/m}^2$
<b>Hull</b> Shell above LBG Plane	$4.1 + 0.057 \times TC \text{ kg/m}^2$
<b>Deck</b> Shell, cockpits, recesses and troughs	$3.7 + 0.043 \times TC \text{ kg/m}^2$

where TC is the actual thickness in mm of the core used in that particular area.

- (d) If the core thickness is less than the minimums specified (i.e., in single skin areas and the surrounding core taper area), the panel weight per square metre shall exceed the following:

	<b>Hull</b> below LBG Plane Fwd of <b>Amidships</b>	Rest of <b>Hull</b> Shell	<b>Deck</b> , cockpits, recesses & troughs
Minimum Panel Weight when core is below minimum thickness	11 kg/m <sup>2</sup>	8 kg/m <sup>2</sup>	5 kg/m <sup>2</sup>

- (e) Except as permitted in **class rule** 18.5 (f) below, filling and fairing outside an outer "rule legal" skin which are used to create or alter the inherent shape of a yacht are limited to a thickness of 51mm measured normal to the skin surface. Where filling and fairing compound is not used to create the inherent shape of the yacht (eg. covering ballast flange bolt heads) no depth limitation applies. The material properties and building process limitations defined in **class rules** 18.6 and 18.7 shall always apply to fairing and filling compounds used.
- (f) Within 200 mm of the stem profile measured in the centreline plane and perpendicular to the stem profile, between the stemhead and the forward LBG mark on the centreline, the core thickness limitations of **class rule** 18.5(b), and the filling/fairing thickness limitations of **class rule** 18.5(e) shall not apply.
- (g) Should the sampling of the **hull** or **deck** demonstrate non-compliance with the minimum weights per unit area or thicknesses in (a), (c) or (d), correction of any shortfall over the non-compliant area shall be made. This shortfall shall be by additional FRP laminate to the satisfaction of the measurer. The measurer may permit the shortfall to be made up with resin where permanency of the addition can be verified.
- 18.6 The internal structure may be of wood of any species, aluminium alloys, **FRP**, or steel and steel alloys, or a combination thereof. These materials shall comply with the following:
- (a) Aluminium Alloys - 2000, 5000, 6000 and 7000 series alloys with a specific gravity greater than 2.65.
- (b) **FRP** - Fibre reinforced thermoset plastics, provided the fibre modulus does not exceed 250 GPa.

- 18.7 The following criteria shall apply to the building processes used for **FRP** construction:
- (a) maximum cure (including post cure) temperature of 105<sup>o</sup> Celsius;
  - (b) maximum pressure at any time during construction of 0.95 atmospheres at STP;
  - (c) use of electric current or electron beam through the laminate during cure is prohibited; and
  - (d) normal hand building methods including the use of clamps and mechanical fastenings are not prohibited under **class rule** 18.7 (b).
- 18.8 The above criteria shall apply to all structural components used in the construction of the **hull** and **deck**, cockpits, recesses and troughs.
- 18.9 All **FRP** materials, except those specially excluded below, shall be supported by a signed certificate of compliance issued by the material manufacturer, together with samples of each, if requested by the measurer, stating that the properties comply with **class rule** 18 as set out in the example material usage schedule shown in Appendix D. The required documents shall include the quantity supplied, relevant batch numbers, and a description to assist identification.
- The following FRP materials used in the construction of the **hull**, **deck** and internal structure are excluded from the documentation requirements. However they shall have mechanical properties less than set out in **class rule** 18.6 and shall be covered by a declaration referencing this clause as set out Appendix C:
- (a) Wet laminate materials where the total quantity of wet laminates used is less than 5% of the total quantity by weight of FRP materials used in the construction of the **hull**, **deck** and internal structure.
  - (b) Ex-stock materials (eg. tube, plate etc.) not exceeding a total of 20 kgs may be used in the construction of the **hull**, **deck** and internal structure. The manufacture of these components are not limited to the manufacturing process limits set out in **class rule** 18.7.
- 18.10 For the purposes of construction, **deck** includes recesses, troughs, cockpit sides, cockpit soles and cockpit bulkheads.
- 18.11 At the **sheerline**, minimum **hull** construction requirements shall apply up to the fair outboard projection of the underside of the **deck**.
- 18.12 For construction purposes the transom, where fitted, is included in the definition of **deck**.
- 18.13 Any exposed inner skins of the **hull** or **deck** (for example, the inside of open 'sugar scoop' sterns above the LBG plane or the underside of **decks** where no cockpit sides or cockpit bulkhead is fitted) shall be constructed to the laminate requirements of the **deck** outer skin.
- 18.14 Any fastening (bolt, screw, rivet or nail etc.) that carries only tension or shear and that is used to attach, fix or secure one element of the yacht to another element may be of any material provided the specific gravity of the fastening is not greater than 11.4.
- 18.15 Compartments or containers that hold liquid in such a manner that may increase performance, are prohibited.
- 18.16 A patented design relating to **hull** configuration is permitted provided the design is available for free use by all competing yachts.
- 18.17 Yachts shall be fitted with a lifting eye(s) which enable weighing by lifting from a single point not more than 2.0m above the deck. When lifted the yacht shall be approximately horizontal.

## 19. APPENDAGES

19.1 **Appendages** shall be constructed from commercially available **FRP** and/or metals and metal alloys. Sandwich materials may also be used provided the material property limitations in **class rules** 19.2 and 19.3 are observed.

19.2 Metal or metal alloys materials used in the construction of appendages shall have the tensile modulus less than 210 Gpa, a specific tensile modulus of less than or equal to  $2.7 \times 10^6$  metres and a specific gravity not greater than 11.4.

All metal and metal alloy materials used in the construction of **appendages** shall be supported by a manufacturer's test certificate or similar instrument which specifies the material designation. The **technical director** may require, a manufacturer's certificate stating the tensile modulus and density of the material supplied.

19.3 When the **appendage** is constructed of FRP composite materials the following limitations shall apply to the materials and building methods used:

- (a) The fibre modulus shall not exceed 250 GPa.
- (b) The cure temperature shall not exceed 135 degrees Celsius.
- (c) The cure pressure shall not exceed 5 atmospheres.
- (d) **Class rule** 19.3(c) does not prohibit normal hand building methods which would include the use of clamps or mechanical fastenings, etc.

19.4 All **FRP** materials shall be supported by a signed certificate of compliance issued by the material manufacturer, together with samples of each if required by the measurer, stating that the properties comply with **class rule** 19 as set out in the example material usage schedule shown in Appendix D . The required documents shall include the quantity supplied, relevant batch numbers, and a description to assist identification.

19.5 Wet laminate **FRP** materials to a maximum of 10% by weight of fibre may be used in the construction of individual **appendages** without requiring documentation specified in **class rule** 19.4. However they shall have mechanical properties less than set out in **class rule** 19.3 and shall be covered by a declaration referencing this clause as set out Appendix C:

19.6 The **owner**, **appendage** designers and **appendage** builders shall provide to the **technical director** a signed declaration similar to that shown in Appendix C confirming each **appendage** has been constructed from materials and using methods permitted with by **class rule** 19.

19.7 An **appendage** constructed to take advantage of the **appendage** building methods criteria (as compared to the **hull** building criteria) may extend into the **hull**. However, the appendage shall not contribute to the strength of the **hull**. The **appendage** shall be able to be removed without damaging the structural integrity of the **hull**.

19.8 **Appendages** may only be attached to the **hull** within the "hollows permitted" zones described in **class rule** 16.1(a).

19.9 The total number of movable **appendages** shall not exceed two, and:

- (a) Movement is limited to rotation only, except translational movement is permitted as per **class rule** 19.11 (c) below.
- (b) The axis of rotation of each movable surface shall be in the vertical fore and aft centreline plane of the **hull** (except as permitted in **class rule** 19.9 (c)) and at an angle to the MWL plane exceeding 45 degrees.

- (c) Each individual movable surface of an articulated surface shall be counted as a separate movable surface. The second axis of rotation of an articulated surface may move off the centreline plane as a result of **appendage** rotation about the first axis provided the first axis remains on the centreline plane. Both the first and second axes of rotation shall be at an angle greater than 45° to the MWL plane.
- (d) **Appendage** rotation shall not increase the righting moment nor change the fore and aft trim nor infringe **raci**ng rule 51 (Moving Ballast) and 42 (Propulsion). This Rule is not infringed by the normal use of a moveable **appendage** which is not ballast.
- (e) **Appendages** which are retractable while racing are not permitted. **Appendages** which are able to be retracted for docking and similar purposes are permitted but shall be in their extended measurement position while racing.
- (f) If a moveable **appendage** extends aft of the aft end of the MWL, the part of the **appendage** which is aft of the aft end of the MWL shall not exceed 250 mm in thickness above a point 200 mm below the MWL plane nor shall its skeg extend aft of the rudder stock centreline except for fairing strips as specified in **class rule** 19.10
- (g) A movable device whose sole purpose is the removal of weed or debris from the **hull** or **appendages** and in no other way enhances the performance of the yacht does not constitute a movable **appendage**. The device may be retracted.
- (h) Appendages which are ballast shall not rotate.

19.10 Fairing strips are permitted provided:

- (a) their deflection away from their position when the moveable **appendage** is centred is caused only by the movement of a moveable **appendage**
- (b) they are attached, in any way along one edge only to either the fixed **appendage** or the movable **appendage** but not both. In the case of a articulated moveable **appendage** fairing strips may be fitted to fair between the movable surfaces but shall only be attached connected or constrained to one of the movable surfaces.
- (c) their chord length as measured from the aftmost point of attachment perpendicular to the axis of rotation is less than 125 mm:
- (d) when the movable **appendage** is centred no part of a fairing strip shall extend outside the "hollows permitted region" described in **class rule** 16.

19.11 Aside from fairing strips permitted in 19.10 flexible contrivances or physical devices or systems to create or control deflections of **appendages** are prohibited.

**21. DECK**

- 21.1 The **deck** shall not have negative camber, i.e., the upper surface of the **deck** shall not fall below a straight line from the **sheerline** on one side of the yacht to the **sheerline** on the transversely opposite side of the yacht. Small transverse hollows that are solely the result of irregularities in the building process are permitted provided they do not exceed 1 mm in 1 m or 3 mm in any length. Open ("sugar scoop") sterns are not prohibited by this rule.
- 21.2 Recesses in the **deck** appropriate in size to accommodate items of gear and equipment and built in accordance with the **deck** construction requirements of **class rule 18** are permitted as follows:
- (a) one only trough to accommodate the spinnaker pole provided it is not wider than 800 mm or deeper than 200 mm measured from the immediately adjacent **deck**;
  - (b) a recess to accommodate the forestay attachment and jib tack fitting;
  - (c) each fitting, including a winch base, may be in one reasonably watertight recess in the **deck** except that a winch drum shall be above the level of the **deck** or in cockpits. Each recess is to be of a size commensurate with the size of the fitting housed. Each recess for a track requiring clearance for a car shall be no larger than that required for the travel of the car on that particular track. In the case of winches with an integral base and drum with the gearing mounted in the base, the drum is deemed to commence at the lower tangent line of the fillet radius of the lower vertical section covering the gearing and the flange of the drum; and
  - (d) recesses for fittings may drain into the **hull** through small openings not exceeding 20 mm in diameter. See also **class rule 24**.

No other recesses are permitted.

**22. COCKPITS**

- 22.1 Cockpits shall only be fitted aft of the aft side of the mast and shall be watertight except that:
- (a) they shall self-drain overboard;
  - (b) small openings are permitted in accordance with **class rule 24**; and
  - (c) openings, each not to exceed 0.1 sq metre in area and each of which are closed by a hinged or screwed watertight cover are permitted.
- 22.2 Cockpits, which include any sugar scoop forward of AGS, shall not be deeper than 750 mm nor shallower than 400 mm below the adjacent **sheerline**, provided that:
- (a) these depth requirements shall apply 100 mm inboard of the cockpit/**deck** corner or the uppermost beginning of the cockpit/**deck** corner radius; and
  - (b) the 100 mm offset shall also apply in the longitudinal dimension for the measurement of cockpit depth at forward and aft cockpit sides and bulkheads.
- 22.3 Small islands in cockpits are permitted, provided:
- (a) they are watertight, except for small openings permitted under **class rule 24**;
  - (b) their size is commensurate with providing a base for normal equipment; and

- (c) where the cockpit sole is cut away under an island, the island shall be constructed in accordance with the **deck** requirements given in **class rule 18**. If the "rule legal" cockpit sole is not cut away under an island, the island may be considered as a "fitting" and need not be constructed in accordance with **class rule 18**. If an island is not constructed to the **deck** requirements of **class rule 18**, any openings through the cockpit sole beneath the island "fitting" shall comply with **class rule 24**.

## 23. HATCHES

- 23.1 The minimum horizontal distance from a hatch opening to the adjacent **sheerline** shall not be less than 800 mm.
- 23.2 Each hatch shall be closed by a cover attached to the **deck** by hinges, slides or similar arrangement and shall be reasonably watertight.
- 23.3 There shall not be more than two hatches forward of the mast. The combined area of these hatch openings shall not exceed 3.0 square metres.
- 23.4 There shall not be more than four hatches aft of the mast. The combined area of these hatches shall not exceed 3.0 square metres. These four permitted openings shall not include the small openings permitted in **class rule 22.1(c)**.
- 23.5 Hatches fitted in cockpit soles shall be watertight. Watertight in this context means a closed hatch shall prevent the ingress of water from a hose applied in any direction.
- 23.6 The weight of hatch covers without hinges or slides attached shall be equal to or greater than the rule minimum weight of **deck** or cockpit area that they replace.

## 24. SMALL OPENINGS

- 24.1 Small openings or holes in the **deck** or in the sides of cockpits for passing rigging or similar lines and attachments are permitted provided they are at least 200 mm above the cockpit sole.
- 24.2 If the area of any small opening or hole permitted in **class rule 24.1** exceeds 40 square centimetres, a rubber gaiter boot or other means of closing the opening shall be provided. Openings in the **deck** may be no larger than required for their specific task. Lightening holes in **decks** are prohibited.

## 25. WINCH PLACEMENT

- 25.1 All winches that are primarily used for sheeting or hoisting sails shall have their drums positioned on or above the **deck**. They shall be located so as to be operated and tailed only from either the **deck**, a cockpit or a hatch in the **deck**.
- 25.2 Headsail sheet winches shall not be located so as to require a crew member to operate or tail such winches from a position in the area bounded by a line drawn to contain the winch, the turning block, the **deck** edge and the shroud.

## 26. SURFACE FINISHES

Further to **raci**ng rule 53:

- (a) No coating or substance (including riblets, LEBUs, polymers, compliant surface structures and detergents) may be applied to the outside of the **hull** or **appendage** surface except for polyurethane, epoxy paint or commonly available paint.

The outside surface of the **hull** or **appendage** may be sanded and/or cleaned with normal concentrations or quantities of detergents or similar materials.

- (b) Holes or devices in or on the surface of the **hull** or **appendages** whose purpose is to bleed off or alter the water flow of the boundary layer are prohibited.

## SECTION E - SPARS

### 27. SPAR CONSTRUCTION

- 27.1 Spars including masts, booms, spinnaker poles, bowsprits and reaching struts shall be constructed from any of the following materials or a combination thereof:
- (a) commercially available **FRP** materials:
  - (b) aluminium alloys of the 2000, 5000, 6000 and 7000 series; and
  - (c) steel and steel alloys.
- 27.2 When a spar is constructed of **FRP** materials, the following limitations shall apply to the materials and building methods used:
- (a) The fibre modulus shall not exceed 310 GPa.
  - (b) The temperature inside any curing vessel shall not exceed 135 degrees Celsius at any time during the building process.
  - (c) The cure pressure shall not exceed 3 atmospheres at any time during the building process.
  - (d) **Class rule 27.2(c)** shall not prohibit normal hand building methods which would include the use of clamps and mechanical fastenings.
- 27.3 Sandwich construction techniques may be used. Sandwich cores may be of any material provided they comply with the **class rules 27.1** and **27.2(a)**.
- 27.4 The **owner**, spar designer(s) and spar builder(s) shall provide to the **technical director** a signed declaration similar to that shown in Appendix C.
- 27.5 All **FRP** materials shall be supported by a signed certificate of compliance issued by the material manufacturer, together with samples of each if requested by the measurer, stating that the properties comply with **class rule 27** as set out in the example material usage schedule shown in Appendix D. The required documents shall include the quantity supplied, relevant batch numbers, and a description to assist identification.
- 27.6 Wet laminate materials to a maximum of 10% by weight of fibre may be used in the construction of individual spars without requiring documentation. However they shall have mechanical properties less than set out in class rule 27.5 and shall be covered by a declaration referencing this clause as set out Appendix C.

## 28. MAST

28.1 The mast in a rigged condition as specified below shall not weigh less than 820 kgs nor have its centre of gravity lower than 12.250 m above the mast datum band. The mast weight and height of centre of gravity may be checked by the measurer at any time including during a post-race measurement check.

(a) The rigged mast shall include:

- (i) all normal standing rigging, spreaders, jumpers, diamonds, all backstays, running backstays including flying blocks (but excluding runner tails), check stays, instruments, instrument sensors, cameras, cables, hydraulic jacks, rams and pipework; and
- (ii) all fittings required to sail the yacht, including mast jacks if an integral part of the mast, headboard car, halyard locks, vang brackets, spinnaker pole slides and fittings, gooseneck bracket or toggle and any means of extending the boom.

(b) The centre of gravity of the mast shall be measured with:

- (i) all standing rigging in place and pulled tight down the mast;
- (ii) headboard car placed at the upper black band; and
- (iii) all sliding fittings except headboard car set in their lowest sailing position.

This list is not intended to be all-inclusive. The principle to be applied as to whether a particular item is included in the measurement of mast weight and centre of gravity is that if a component remains attached to the mast when the mast is removed from the yacht except halyards, it shall be deemed to be part of the mast for measurement purposes.

(c) Except for spinnaker pole car lifting tackle, which may be left in place, all halyards and running rigging including runner tails are to be removed from the mast when the mast is weighed and the centre of gravity established. (Light weight mouse lines not exceeding 4 mm diameter for running rigging may be in place if desired).

(d) When rigging is lowered whilst racing the weight of the mast and the centre of gravity of the mast shall be measured with the rigging at the heel of the mast.

28.2 The mast tube taper in silhouette shall be a fair convex curve in the fore and aft and athwartships directions, and the mast tube shall have the following dimensions:

Position	Maximum Fore and Aft Length	Minimum Fore and Aft Length	Minimum Athwartships
At datum band	430 mm	300 mm	150 mm
At I point	364 mm	260 mm	150 mm
At top band	210 mm	150 mm	130 mm

(a) The tolerance for construction deviations away from a fair rounding taper shall be a maximum of 1 mm in 1.0 m or 3 mm in any length. Under no circumstance shall the silhouette be less than a straight line between the minimum dimensions at the measurement points.

(b) The mast may be locally reinforced either internally or externally in way of fittings. The minimum dimensions and the fair rounding taper shall be maintained under any local reinforcement.

(c) The silhouette "fair convex curve" requirements shall apply from the upper measurement band to the measurement datum band.

- (d) The maximum fore and aft dimension at any point shall not exceed 430 mm.
- 28.3 Measurement bands, not less than 30 mm wide, shall be marked on the mast so that they are clearly discernible when racing as follows:
- (a) datum band, the upper edge of which shall not be more than 500 mm above the **sheerline** at the forward face of the mast with the mast vertical;
  - (b) lower band (BAD), the upper edge of which shall not be less than 1.300m above the datum, nor more than 1.500m above the datum; and
  - (c) upper band, the lower edge of which shall not be more than 32.000m above the datum.
- 28.4 When the boom is horizontal and at its lowest position on the mast, the line of the top of the boom including groove or sail track, when extended, shall not be below the upper edge of the lower band (BAD).
- 28.5 Permanently bent, **deck** stepped, rotating and hinged masts are prohibited. For the purpose of this rule, a permanent set not exceeding 200 mm between the upper and lower measurement bands on the aft edge is permitted.
- 28.6 No device other than the normal attachment of running backstays and loads from sails shall induce twist in the mast. Spreaders, rigging attachments and other devices which are specifically engineered or arranged on the mast section to induce twist are prohibited. Port and starboard spreaders are not to be coupled so rotation of one spreader causes movement of the other.
- 28.7 No devices shall be fitted or employed to move the athwartships or rotational position of the mast at its heel or at the **deck**. The mast step is to be arranged so the mast is prevented from horizontal rotational movement relative to the step greater than 0.5 degrees. The horizontal clearance around the mast at the mast partners shall be arranged so the mast is preventing from twisting more than 2 degrees at the partners.
- 28.8 No device is permitted to move the mast to windward of its normal sailing position. (This requirement is not intended to limit the normal use of running backstays or asymmetrically adjusted jumpers/diamonds provided the jumper/diamond struts are above the I point). Adjustment whilst racing of standing rigging spreaders is not permitted.
- 28.9 The mast in section shall be a continuous single surface tube except in way of joints and similar areas and shall not have slots, slats or similar devices or contrivances to enhance the aerodynamic performance except the following which are permitted
- (a) fittings to attach sails and rigging, etc.
  - (b) Slots and holes for specific purposes such as halyard exits or fittings etc. are permitted however they shall be no larger than required to fulfil their intended purpose.
  - (c) local covers over fittings to protect sails and running rigging.
  - (d) a spinnaker pole butt track which is clearly distinguishable from the mast tube and which is no longer than necessary for the pole to be dipped so that the outboard end of the spinnaker pole clears the inside of the forestay at the **deck**.
  - (e) a spinnaker pole butt track housed in a recess in the foreside of the mast. The recess and the track shall be no longer than necessary for the pole to be dipped so that the outboard end of the spinnaker pole clears the inside of the forestay at the **deck** is permitted.

- 28.10 Holes whose function is to reduce the torsional stiffness of the mast, even if filled or covered with rule legal materials, are prohibited.
- 28.11 Masts may be fitted with internal bulkheads. Any internal bulkheads shall not be designed such that they carry a significant proportion of vertical compression loads and vertical bending moments. Drawings and calculations may be requested by the **technical director** predicting the load carried by the tube and by the bulkhead for a unit compressive load and unit bending moment. Materials used for internal bulkheads shall comply with the **class rules** for the construction of spars.
- 28.12 No fairings are permitted between the mast and mainsail. This prohibition includes fairings over headboards and headboard cars, batten cars or batten car tracks. If the mainsail bolt rope track is not part of the mast single surface tube and is therefore a fitting, the recess to house the bolt rope shall be no larger in diameter than that required for the bolt rope and the bolt rope tube shall touch the aft face of the mast tube. The bolt rope shall be no larger than necessary and the distance from the forward side of the bolt rope recess shall not be more than 6 mm from the aft face of the mast tube. This 6mm limitation shall only apply to bolt rope tracks fitted after March 2, 2000.
- 28.13 The maximum fore and aft movement of the mast at **deck** level shall be 300 mm.
- 28.14 The mast shall be stepped at or below the MWL plane. For the purposes of this Rule the mast shall be deemed to be stepped at the lowest component of the mast/mast base/mast plug which is removed with the mast when the mast is removed from the yacht.
- 28.15 The highest point of the mainsail, headboard and/or the headboard carriage on the mast shall not extend above the lower edge of the upper measurement band.
- 28.16 The luff groove or track on the mast shall be fixed and not move side to side on the mast section.

## 29. BOOM

29.1 The boom, including any sail groove or track but excluding other fittings, shall not exceed 600 mm in depth. No part of the boom shall exceed 400 mm in width. Struts and outriggers are prohibited.

29.2 The top longitudinal surface or edge of the boom shall be straight within a tolerance of 20 mm between the extreme ends of the top of the boom. A recess for an outhaul track whose top is a fair extension of the top longitudinal surface or edge of the rest of the boom is permitted.

29.3 The centre of the attachment of the clew of the mainsail shall not be more than 100 mm above the top of the boom. See also **class rule 35.4**.

## 30. SPINNAKER POLE

Maximum pole length is  $J \times 1.35\text{m}$  (see **class rule 34.2(b)(iii)**) measured from the centreline on the forward side of the mast to the outer extremity of the pole or end fitting in the position which gives the largest measurement.

## 31. BOWSPRIT

31.1 A bowsprit is defined as a spar extending beyond the stemhead at or above **deck** level for the tacking of a spinnaker or leading of a spinnaker foreguy.

31.2 A bowsprit, if fitted, shall be able to be removed from the **hull** without damaging the structural integrity of the **hull**.

31.3 The bowsprit, if fitted, shall be fastened to the **hull** by mechanical means only (bolts, rivets, etc.) This requirement shall not preclude the use of small quantities of non-structural sealing compound at the point(s) of attachment to the **hull**.

32. (spare.)

**SECTION F - SAILS**

## 33. SAILS - GENERAL

- 33.1 The yacht shall be sloop rigged with one mast only.
- 33.2 Except as otherwise prescribed in the **class rule**, sails shall be made and measured in accordance with the **ISAF** Guide to Sail Measurement 1997-2000.
- 33.3 Non-woven and multi-ply sails are permitted.
- 33.4 Reinforcement of a sail may be of any size and any number of layers provided it is flexible and capable of being folded without damaging the sail or reinforcement. "Damage" being defined as, apart from clearly visible structural failure, failure of the sail to return to near flat after being folded. Local reinforcement and/or padding at spreader patches and similar chafing areas individually not exceeding 1.0 sq metre may be any material provided it is flexible and capable of being folded without damaging the sail or reinforcement and shall not be limited by **class rule** 33.5(a).
- 33.5 Specifically prohibited are:
- (a) artificially thickened sails, eg. foamed sails; and
  - (b) multiple-surface sails, whether inflated by the action of the wind or otherwise.
- 33.6 A headsail (genoa, jib, or any other contrivance for extending the sail to other than staysail or spinnaker) shall not have a club-foot or foot-yard, nor have more than one sheet triangular shape.
- 33.7 For single-round events (eg., World Championships), unless otherwise specified in the Notice of Race, the maximum number of sails permitted to be measured and used in that regatta shall be 15.
- 33.8 For multiple-round events (eg. the America's Cup Trials and Match with the America's Cup Match being the final round of multiple round event), the maximum number of sails permitted to be measured shall be 60. Furthermore only 30 of the possible 60 sails shall be able to be registered to be used in the America's Cup Match. Once a sail is measured it shall remain part of the measured inventory for the duration of the event.
- 33.9 Sail damage or loss shall not be grounds for replacement of measured sails. In the case of a natural catastrophe beyond the reasonable control of a yacht, the measurement committee, in consultation with the jury and the event organisers, may allow additional sails to be measured and used. Natural catastrophe in this sense does not include wear and tear, damage or loss which results from the sailing activities of the yacht.
- 33.10 Sail repairs and alterations to sails measured for an event as defined in **class rules** 33.7 and 33.8 are permitted with specific approval of the regatta measurement committee and in accordance with the following limitations:
- (a) no more than 10% of the original projected area of fabric of any mainsail, genoa, jib or staysail may be replaced,
  - (b) no more than 20% of the original surface area of fabric of any spinnaker may be replaced
  - (c) No measured dimension, excluding CO and E1 on mainsails, of any sail may be altered by more than 10% from its original measurement. Alterations to CO and E1 on mainsails is not limited.

For the purpose of this rule "original" means the area or dimension(s) of a sail when first measured.

34. MEASURED SAIL AREA (see also **class rule 8**)

## 34.1 Mainsail:

- (a) The intention of this rule is to find the actual area of the mainsail using the formula below. If, in the opinion of the measurer, the area is not being accurately measured using the following formula, he may use another method after reference to the **technical director**:

$$\text{MSA} = (P-0.5) \times (E1 + 4E2 + 2E3 + 4E4 + E5)/12 + \text{FTA},$$

where  $E5 > E4 > E3 > E2 > E1$ , and

where P is the distance between the lower edge of the upper measurement band and the upper edge of the lower measurement band on the mast.

- (b) E1 shall be measured at a height 500 mm below the head of the sail perpendicular to a line joining a point on the luff 500 mm below the head of the sail and the tack.
- (c) E5 shall be the girth of the sail measured perpendicular to a line joining a point on the luff 500 mm below the head of the mainsail and tack of the sail, from the tack (intersection of luff and foot projected if necessary) to the leech (or projected leech).
- (d) E2, E3 and E4 are equally spaced (between E1 and E5) girth ordinates perpendicular to a line joining a point on the luff 500 mm below the head of the mainsail and tack of the sail. These girths shall be measured from luff to leech.
- (e) All luff and leech hollows shall be bridged for measurement purposes.
- (f)  $\text{FTA} = E5 \times \text{CO}/2$ ,  
 where CO equals the perpendicular distance from the E5 girth line to the clew. If the clew is below the E5 girth line, CO is positive. If the clew is above the E5 girth line, CO is negative. FTA may be a negative component in calculating MSA. In the case where the actual length of the mainsail luff exceeds P, CO equals the perpendicular distance from the perpendicular ordinate at the base of P to the clew.
- (g) The sail area above E1 and below a line joining the tack to the clew shall not be measured.
- (h) The foot round offset below a line joining the tack and clew shall not exceed 750 mm.

## 34.2 Foretriangle

The area of the foretriangle shall be calculated using the following formula:

$$(I \times J) / 2,$$

where:

- (a) I is measured from the upper edge of the mast datum band to a height not exceeding

$$I \leq 0.8 \times (P + \text{BAD}); \text{ and}$$

the upper point of I shall be the highest of:

- (i) the intersection of the line of the aft side of the forestay with the forward side of the mast;

- (ii) the intersection of the line of the forward side of the headfoil into which the luff of a headsail is fitted, with the forward side of the mast;
- (iii) the bearing surface of a jib halyard sheave in the mast above which the sail cannot be hoisted; or
- (iv) the intersection of a line parallel to the forestay with the forward side of the mast through any contrivance which supports a jib halyard forward of the face of the mast.

A halyard which has its bearing surface above the "I" point defined in Rule 34.2(a) may be used to raise a sail in the foretriangle provided the halyard is restrained by a contrivance as defined in Rule 34.2(a)(iv) which is at or below the "I" point. This contrivance may be open to allow the halyard to be used for another purpose however when it is being used to raise a genoa, jib or staysail the halyard must be retained by the contrivance.

(b) J is the greatest measurement of:

- (i) the forward side of the mast to the intersection of the line of the aft side of the forestay with a transverse line joining points on the local **sheerline** port and starboard; or
- (ii) the forward side of the mast to the intersection of the line of the forward side of the headfoil with a transverse line joining points on the local **sheerline** port and starboard; or
- (iii) the spinnaker pole length divided by 1.35.

If the track for the spinnaker pole complies with class rule 28.9(d) the J measurement shall disregard the track in the measurement of J.

If the track for the spinnaker pole complies with class rule 28.9(e) the J measurement shall be measured from the forwardmost point on the mast.

(c) Neither I nor J may be extended by the attachment of any device.

### 34.3 Spinnaker

(a) Spinnaker sail area shall not exceed  $1.5 \times SM$  and shall be measured by the following formula:

$$SSA = (SLU + SLE) \times (SF/12 + SMG/3)$$

(b) SP shall be measured from the upper edge of the mast datum band to a height not exceeding

$$SP \leq 1.25 \times I.$$

(c) The upper point of SP shall be the highest of:

- (i) the bearing surface of the spinnaker halyard sheave in the mast above which the sail cannot be hoisted; or
- (ii) the intersection of a line parallel to an imaginary stay with the forward side of the mast to the forward end of J through any contrivance which supports a spinnaker halyard forward of the face of the mast.

Vertical rollers which are offset from the centreline and are parallel to the centreline of the mast and each side of the spinnaker halyard sheave do not constitute a contrivance which supports the halyard forward of the mast provided they are of a

size and offset forward of the mast commensurate with their function of only providing a fair lead for the halyard onto the halyard sheave.

### 35. MAINSAIL

35.1 Maximum headboard width shall be 250 mm measured from the aft side of the mast.

35.2 Luff zippers are not permitted.

35.3 No device shall be used to control the mainsail except mainsheet, vang, halyard, cunningham system, clew adjusters, leech line, footlines and normal reefing systems. Only one leech line may be fitted, and it shall follow the entire length of the leech from head to clew, except that at either the head or the clew, the line may exit the sail to permit adjustment. This Rule shall not preclude the use of secondary control devices (eg. mainsheet travellers) which are only used to control the primary control devices listed above.

35.4 No dimension of the clew ring shall exceed 150 mm.

35.5 The mainsail luff shall be attached directly to mast by slides or bolt rope over its complete length except at the head and tack where the luff may be free from the mast for a distance not exceeding 1.0 m.

35.6 Mainsails shall be able to be lowered to the **deck** without the necessity of a crew member going aloft.

### 36. GENOAS, JIBS AND STAYSAILS

36.1 A jib is defined as a headsail with a foot length, including the fore and aft length of any luff support device, less than J.

36.2 The maximum foot length of any genoa or staysail, including the fore and aft length of any luff support device, shall be  $(J + 3.0 \text{ m})$ .

36.3 **Racing rule** 50.4 shall not apply. The maximum mid-girth of any genoa, jib or staysail, measured between the mid-points of the luff and leech, shall not exceed 60% of the actual length of the foot.

36.4 When in use, a genoa, jib or staysail shall be tacked aft of the forward end of J such that the clew cannot extend more than 3.0 m aft of the forward side of the mast.

36.5 A staysail is a headsail set in addition to a spinnaker or other headsail. When two headsails are set, the staysail is the headsail tacked in the aftmost position.

36.6 Headsails shall be able to be lowered to the **deck** without the necessity of a crew member going aloft.

## 37. SPINNAKERS

- 37.1 The mid-girth, SMG, shall be greater than  $0.65 \times SF$  and shall be taken as the distance between the mid-points of the luff and the leech measured as the shortest path on the surface of the sail.
- 37.2 Intentional openings in the sail, excluding normal cringles, are prohibited.
- 37.3 **Racing rule** 50.3 is altered to permit a line, adjustable or fixed, to be led from the tack of a spinnaker to or through a bowsprit or the **deck** at a point not more than  $1.2 \times J$  forward of the forward face of the mast in its aft most position. This tacking point shall be defined by the intersection of the centreline of an imaginary stay from the mast head with the top of the bowsprit or **deck**.
- 37.4 In clarification of **racing rule** 50.2, a reaching strut used only to deflect the spinnaker afterguy is permitted. A reaching strut does not need to be attached to the mast.

## 38. BATTENS

- 38.1 The maximum number of battens are as follows:

Mainsail	10
Jib	10
Genoa	0
Staysail with foot length less than J	10
Staysail with foot length more than J	0
Spinnaker	0

- 38.2 Battens shall not be permitted below a line joining the tack and clew of any sail (foot).
- 38.3 Battens shall be able to pass through a 100 mm diameter circle and shall not be inflatable.
- 38.4 Materials used in the construction of battens shall comply with the material limitations specified for the construction of spars in **class rule** 27. No limitations on the fabrication method of battens shall apply.
- 38.5 Battens shall not be adjusted while racing.

## 39. CLASS INSIGNIA, NATIONAL LETTERS AND SAIL NUMBERS.

- 39.1 The class insignia shall be the image of the America's Cup as depicted in Appendix E. This image shall not be changed in style. The image shall be 2.5 m high and shall be placed back to back on the mainsail with the "pouring lip" side of the America's Cup closest to the luff of the mainsail.
- 39.2 Class insignia, national letters and sail numbers are required to be carried on the mainsail only, altering **racing rule** appendix H1.1.
- 39.3 Altering **racing rule** H1.3(c) the sail numbers may be placed on the same line following the national letters.

- 39.4 The following minimum sizes for national letters and sail numbers are prescribed, altering **racing rule** appendix H1.2 (b).

Height	1200 mm
Width	800 mm*
Thickness	180 mm
Space between adjoining letters/numbers	240 mm

\* except the number "1" and the letter "I".

- 39.5 Altering **racing rule** appendix H1.1(c), a new sail number shall be allotted by the **technical director**:

- (a) when construction of the yacht is commenced. Construction is deemed to commence upon lamination the first skin of the **hull**. The first skin shall be the inner skin of a **hull** constructed on a male mould or alternatively the outer skin on a female mould. Where the **hull** is built in sections it shall be the first skin on any **hull** component exceeding 25% of the **hull** by area ("Commencement of Construction"); or
- (b) when the hull is altered by 50% or more from the original shape. This alteration is defined by the exterior surface area of the change relative to the original area of the hull. "Original" is defined as:
- (i) for a yacht which was completed prior to March 2, 2000: the shape of the hull as at March 2, 2000. "Completion" is defined as the earliest of conduct of the post construction inspection or the launching of the yacht.
- (ii) for a yacht which was completed after March 2, 2000: the shape of the hull upon completion. "Completion" is defined as the earliest of conduct of the post construction inspection or the launching of the yacht.

100% of the deck may be altered without affecting the yacht's sail number.

Repairs, including the replacement of substantial amounts of the **hull** skins and/or core, shall not be considered alterations if the **hull** is returned to either its original, as-built shape, or to its previously-approved altered shape immediately prior to the damage.

In determining permitted alterations reference must be made to the Protocol for America's Cup XXXI Article 16 and its attendant Interpretation.

- 39.6 A new sail number allotted by the **technical director** in accordance with **class rule** 39.5 will be formally issued when a measurement certificate is endorsed by the **technical director**.
- 39.7 Sail numbers shall be issued sequentially beginning with number 1 and irrespective of nationality. When a yacht's ownership is transferred from one country to another, it shall retain the same sail number with only the national letters being changed.

## SECTION G - OTHER RULES

### 40. RIGGING, FITTINGS AND OTHER EQUIPMENT

- 40.1 Standing rigging including bobstays (but not including fittings such as clevis pins, turnbuckles, spreader tip cups etc.) shall be made only of materials of specific tensile modulus equal to or less than  $2.7 \times 10^6$  metres and a tensile modulus less than 210 GPa. Carbon, aramid, and polymer fibres, and cobalt alloy rigging are not permitted except aramid or polymer fibres may be used for all backstays including running backstays.
- (a) The **owner** shall provide to the **technical director** a signed declaration similar to that shown in Appendix C stating the material used for the standing rigging has a specific tensile modulus less than  $2.7 \times 10^6$  metres and a tensile modulus less than 210 GPa.
- 40.2 Standing rigging shall be of circular cross section. For the purposes of this rule a tolerance of 5% on diameter shall be permitted. Fairings on standing rigging are prohibited. Rigging elements may be bundled together and not considered to be fairing provided the outside shape of the bundling is circular with a 5% tolerance on diameter. This rule shall not preclude the use of headfoils and similar devices on the forestay for housing headsail bolt rope(s).
- 40.3 The maximum cross-sectional dimension of a headstay or headsail support device shall not exceed 75 mm.
- 40.4 Running rigging may be made of steel alloy, or rope of natural or synthetic materials such as Kevlar<sup>(TM)</sup>, Vectran<sup>(TM)</sup>, Dyneema<sup>(TM)</sup>, and Spectra<sup>(TM)</sup>. Carbon fibre is not permitted.
- 40.5 A short synthetic strop at the lower end of the forestay which is no longer than required to take up the slack forestay when running is permitted and is considered to be running rigging. As such the materials permitted for this strop are given in Rule 40.4. See also **class rule** 36.4. In accordance with **Racing Rule** 54 the strop and therefore the forestay shall remain attached to the forward end of the yacht at all times whilst racing.
- 40.6 Fittings may be constructed of any material except boron, beryllium and ceramics.
- 40.7 While racing, a yacht shall carry onboard the equipment listed in **class rule** 48.7. All equipment shall be bona fide of the nature common to the usual fittings of a yacht and shall not be of the nature of ballast.
- 40.8 The total weight of consumable stores (including generator fuel) and containers carried while racing shall not exceed 100 kgs.
- 40.9 Generators are permitted and shall be fixed in position. They may be used while racing only to power electronic instrumentation.
- 40.10 **Racing rule** 49.1 does not apply. No device shall be used to project a crew member's weight outboard for the purpose of increasing stability. For the purposes of this rule "device" means any fitting, rigging or structure which, if removed singularly or severally, would result in the crew member falling overboard. "Increasing stability" means if the crew member's weight ceased to be projected outboard of the **sheerline** the yacht's righting moment would decrease.

## 41. CREW

41.1 Unless otherwise prescribed, the maximum number of crew permitted shall be:

- (a) sixteen crew members whose total body weight shall not exceed 1450 kgs; and
- (b) one **owner's** representative who shall;
  - (i) not contribute to the racing of the yacht other than by the positioning of his weight;
  - (ii) be positioned aft of the yacht's helm and with his torso inboard of a vertical line above the **sheerline**; and
  - (iii) wear clothing of a colour which is clearly distinguishable from other members of the crew.

Further to **class rule** 41.1(b)(i), unless otherwise prescribed by the sailing instructions, a person with acknowledged technical or tactical skill (yacht designers, sail designers, or sailing coaches would be specific, though non-exhaustive examples) shall be considered to be contributing to the racing of the yacht whether or not that person does "contribute to the racing of the yacht" during that particular race.

- (c) All crew members clothing and equipment shall comply with **Racing Rule** 43.1.

## 42. (spare)

## SECTION H - INSPECTION AND MEASUREMENT

### 43. MEASUREMENT - GENERAL

- 43.1 Measurements shall be taken in accordance with the **ISAF** Measurement Instructions unless otherwise prescribed.
- 43.2 A measurer shall not take any measurements other than those necessary for determining compliance with the **class rule**, except as directed by the **technical director**.
- 43.3 Unless otherwise prescribed, all measurements shall be taken without crew onboard.
- 43.4 At the time of measurement ashore and afloat, backstays, runners and forestays shall be slack.
- 43.5 Calculations shall be rounded to the nearest millimetre, or the third place of decimals for measurements of area. The angles  $\theta$  and  $\phi$  shall be measured to two decimal places. The weight of the yacht shall be rounded to the nearest 25 kg. Intermediate calculations are to be rounded to three decimal places before using that result in subsequent calculations.
- 43.6 A yacht may be re-measured at the discretion of the **technical director** or the **measurement committee**.
- 43.7 As new technology is rapidly evolving for the conduct of tests for materials and methods, the yacht may be subjected to tests for rule compliance which may not be specifically set forth herein at the discretion of the **technical director**.
- 43.8 ("Grandfather Rule") Yachts shall be inspected, measured in accordance with, and otherwise comply with, the **class rule** and construction requirements current when the yacht was first certificated, except that:
- (a) replacement spars, and associated equipment shall comply with the **class rule** current at the time of replacement.
  - (b) sails shall comply with the current **class rule**; and
  - (c) a yacht which has had the shape of the underwater part of the **hull** (excluding the **appendages**) altered, shall be measured under the **class rule** current at the time of alteration.

### 44. MEASURERS

- 44.1 Only measurers approved by the **technical director** shall inspect or measure ACC yachts.
- 44.2 A measurer shall not inspect or measure yachts, spars, sails and other equipment which he owns, designed or built, or in which he otherwise has a vested interest.

#### 45. COMPLIANCE AND ASSISTANCE

- 45.1 Prior to presenting a yacht for inspection or measurement, the **owner** shall ensure that the yacht complies with the **Class rule**.
- 45.2 ("Gross Non-Compliance Rule") If, in the opinion of a measurer, a yacht presented is grossly out of compliance with the applicable rules, he shall so report to the **technical director** and, if at a regatta, the jury. At a regatta, gross non-compliance in and of itself shall be grounds for action under **racing rule 69**.
- 45.3 The **owner** shall permit and assist all inspections and measurements by measurers and **measurement committees** and shall afford all reasonable facility to carry out such measurements and inspections.
- 45.4 The **owner** shall ensure that the yacht, its spars, sails and equipment comply with the **Class rules** and **Racing Rules** at all times while racing and that any alterations, replacements and repairs do not invalidate the measurement certificate.

#### 46. DECLARATIONS AND POST-CONSTRUCTION INSPECTIONS

- 46.1 Upon completion of the **hull** and **deck** and prior to the post construction inspection, declarations shall be submitted to the **technical director** stating that the **hull** has been constructed in accordance with the **Class rule**. The declaration(s) shall be signed by the yacht's designer(s), builder(s), and **owner**. The form of this declaration shall be as shown in Appendix C.
- 46.2 A post-construction inspection shall be carried out by the measurer prior to or upon completion of the **hull** and **deck**, preferably prior to painting.
- 46.3 A minimum of eight samples (at least 5 from the **hull** and 3 from the **deck**) of approximately 50 mm diameter shall be taken from the yacht. These samples shall be taken in the presence of the measurer, and at positions selected by the **technical director** or, at the discretion of the **technical director**, the measurer. All samples shall be indelibly marked with the name of the yacht and the position from which the sample came. The samples shall be sent to the **technical director**.
- 46.4 Additional core samples may be taken at the discretion of the measurer.
- 46.5 In addition to the above sampling, the **hull** and **deck** may be fully tested to ensure the skin thicknesses are in accordance with the rule requirements. This testing may be carried out by physical measurement or other means at the discretion of the **technical director**.
- 46.6 A diagram shall be submitted by the measurer to the **technical director** indicating the approximate position of each test point. This diagram shall also indicate the position of the core samples.
- 46.7 If an **owner** disputes the measurer's selection of method or position of sampling or testing, the matter shall be referred to the **technical director** whose decision shall be final.
- 46.8 Such samples may be submitted by the **technical director** to an independent laboratory, selected by **CORD**, for testing to establish the cure temperature and material properties.

46.9 Upon completion of the spars, **keels**, and **appendages** , a declaration for each item shall be submitted to the **technical director** stating that the construction materials and methods used are in accordance with the **Class rule**. Upon completion of the yacht but prior to the issue of a certificate, a declaration declaring the rigging, surface finish, wet laminates and fittings comply with the relevant **Class rules** shall be submitted to the **technical director**. The form of these declarations shall be as shown in Appendix C.

#### 47. MEASUREMENT MARKS

47.1 Original measurement points shall be permanently marked with a cross head screw driven into the **hull** as shown in Appendix B. The centre of the cross head screw shall mark the measurement point.

47.2 Measurement points which are re-located due to a measurement re-configuration of the yacht shall be marked by an indentation in the surface of the **hull**.

#### 48. MEASUREMENT AFLOAT

48.1 With the yacht afloat the measurer shall check that the yacht floats on the MWL. This checking shall be conducted by measuring freeboards to the uppermost girthing points at the FGS and AGS stations.

48.2 This flotation should be carried out in sea water of specific gravity of 1.025. The specific gravity shall be measured and recorded at the time of measurement afloat.

48.2 For minor differences of specific gravity, the measurer shall allow 0.35 mm sinkage or bodily rise for each 0.001 variation in specific gravity, measured at the time of measurement afloat.

48.4 Immediately following a successful flotation as defined in **class rule** 48.1, the yacht shall be weighed and this weight used in the calculation of the formula.

48.5 Should scales not be available to accurately weigh the yacht, this requirement may be replaced by a declaration from the yacht's designer stating the weight of the yacht. When a declaration is used in the calculation of the formula the yacht's certificate shall be endorsed with a note stating "Designer Declared Weight". The yacht shall not be eligible to compete in an international regatta until the yacht is accurately weighed.

48.6 For the measurement afloat the sails shall be removed, the mast shall be vertical and the fore and aft running and standing rigging slack. The running backstays may be at any position between their aft rigged position and the mast.

- 48.7 When the yacht is measured afloat, the following items shall be onboard and in their normal fore and aft position of use; other non-specified equipment may be removed:
- (a) spars and associated standing rigging, including spinnaker pole(s);
  - (b) normal halyards, running backstays and one set of sheets for mainsail, genoa and spinnaker, together with associated turning blocks;
  - (c) all winches, including drive units, pedestals and cranks, together with not less than two handles for **deck** winches;
  - (d) hatch covers as specified in **class rule 23**;
  - (e) floorboards as normally used;
  - (f) all batteries and/or generators (their position shall be noted on the certificate and they shall be in that position while racing);
  - (g) life-jackets, one per crew member and one for the **owner's** representative;
  - (h) one anchor of high holding power and weighing not less than 18 kgs with not less than 10.0m of 10 mm short link steel chain shackled to the anchor and attached to 90 m of 16 mm dacron or nylon rope;
  - (i) running lights;
  - (j) a horseshoe type lifebuoy, fitted with a whistle, kept on **deck** within reach of the crew;
  - (k) navigational computers and associated electronics;
  - (l) inside ballast, the location and weight of which shall be recorded on the certificate.
  - (m) an air horn or similar sound signal device
- 48.8 Where other equipment and spares not specified in **class rule 48.7** which are always carried aboard when racing (such as blocks, winch handles, and spare sheets etc.) are to remain aboard for flotation and weighing, they shall be weighed and the weight and position noted on the yacht's certificate.
- 48.9 Whilst racing the weight of the yacht without the crew and their clothing, but including the sails and all equipment carried while racing not otherwise specified in class Rules 48.7 and 48.8 shall not exceed the measurement certificate weight by more than 1000 kgs. When checking this requirement the measurement committee shall allow a reasonable time to drain water from the yacht and equipment.
- 49 MEASUREMENT CERTIFICATE
- 49.1 The measurement certificate form, Appendix A, shall be used in issuing measurement certificates in accordance with the **class rule**.
- 49.2 To obtain a measurement certificate:
- (a) The **owner** shall arrange for a measurer approved in accordance with **class rule 44** to inspect and measure the yacht.
  - (b) Following inspection and measurement, the measurer shall send the completed original measurement certificate form to the **technical director**.
  - (c) The **technical director** shall satisfy himself, so far as he can, that the yacht has been inspected and measured correctly.

- (d) When so satisfied, the **technical director** shall endorse the measurement certificate and return it to the **owner** while retaining a copy.

49.3 The measurement certificate ceases to be valid if:

- (a) there is any change in the yacht's displacement or trim except as specifically permitted under **class rule** 49.3(c);
- (b) there are any changes to the yacht's **appendages**, except in the case of damage, a damaged **appendage** may be replaced with a similar **appendage**, as defined below, with the written approval of the **technical director**;
- (i) Appendages may only be replaced if they cannot be repaired in a reasonable regatta constrained time as determined by the **technical director**.
- (ii) Appendages with a nett specific gravity of 10 or more shall not vary more than 2% of the weight and wetted surface from the original (certificate) appendage.
- (iii) Appendages with a nett specific gravity of 1 or less shall not vary more than 10% in weight, and wetted surface from the original (certificate) appendage.
- (iv) Appendages with a nett specific gravity between 1 and 10 may vary proportionally to its nett specific gravity based on the allowable variation given above (ie. SG = 5 allowable variation 6.44% on weight and wetted surface).
- (v) In the case of fins, trim tabs, wings and rudders neither the span nor the chord length may not vary more than 10% from the original appendage.
- (vi) In the case of bulbs the sides of the circumscribing rectangular prism of the bulb may not vary by more than 10% on any orthogonal axis from the original appendage.

The appendage weight in (ii), (iii) and (iv) above shall include any integral stock type permanent attachments. The wetted surface in (ii), (iii) and (iv) above shall only include surfaces exposed to the flow of water (not stocks and attachment components).

- (c) there is any change made to the yacht's measurement certificate except in the case of the substitution of equipment, (masts, boom, spinnaker poles, winches, fittings etc.). The certificate will cease to be valid if the nett change in weight of the substituted equipment from the equipment that was present when the yacht was floated and weighed exceeds 25 kgs;
- (d) there is any change to the yacht's internal or external ballast;
- (e) any dimension of the rated sail area is increased;
- (f) the attachment position of the forestay at the **deck** is moved;
- (g) the position of the mast at any time reduces the J measurement by more than 300 mm; or
- (h) any alteration is made which would cause the yacht not to comply with any requirements of the **class rule** or the measurement certificate.

49.4 In the case of certificate invalidation as per **class rule** 49.3, a new measurement certificate may be issued or the current certificate re-validated following a partial or complete re-measurement, as appropriate.

- 49.5 A yacht shall have only one valid measurement certificate at any one time.
- 49.6 Upon request by anyone, a copy of the front page of a yacht's measurement certificate shall be provided by the **technical director**. A nominal administrative fee approved by **CORD** may be charged.
- 49.7 At a regatta, a copy of the yacht's entire certificate shall be provided by the **owner** to the **measurement committee**.
- 49.8 The **technical director**, measurers and the **measurement committee** shall hold certificates in strict confidence.
-



# AMERICA'S CUP CLASS

## Measurement Certificate No

Office Use Only

Original to Owner ( )

Copy to TD File ( )

Other Copies ( )

Yacht's Name

National Letters  
and Sail Number

Designer(s)

Builder(s)

Owner(s)

### VALIDATION

This yacht has been measured by measurer(s) approved in accordance with the America's Cup Class Rule and has been found to be in compliance with the Rule.

This certificate is dated

Supersedes Certificate No and Date

\_\_\_\_\_  
IACC Technical Director

<b>RATING CALCULATION</b>			
		Page No	2 of 5
Yacht		Sail Number	
<b>OVERALL LENGTH</b>			
Overhang Forward to FLM			
Overhang Aft to ALM			
Total Overhang			
<b>LBG ( Length Between Girth Stations )</b>			
FG (Forward Girth)			
$\theta$			
FBC (Max(-.116 or $-1.8(1/\cos\theta-1)$ ))			
FGC (Max(0.3 or $1.25(FG-2.4+FBC)$ ))			
AG (Aft Girth)			
$\phi$			
ABC (Max( $\phi$ or $1.414-(1/\cos\phi)$ ))			
AGC (Max(1.6 or $0.75*(AG-1.8+ABC)$ ))			
G ( FGC + AGC )			
<b>LM ( Measured Length = LBG+G )</b>			
FP (Freeboard Penalty See Page 3)			
DP (Draft Penalty See Page 3)			
WP (Weight Penalty See Page 3)			
BP (Beam Penalty See Page 3)			
<b>L (Rated Length=<math>LM*(1+0.01*(LM-21.2)^8</math>)+FP+DP+WP+BP</b>			
<b>SM ( Measured Sail Area : See Page 4 )</b>			
<b>S ( Rated Sail Area = <math>SM*(1+0.001*(SM^{0.5}-16.9)^8</math>)</b>			
<b><math>1.25 * S^{0.5}</math></b>			
<b>W ( Weight of Yacht in Kgs)</b>			
<b>DSP ( Displacement (m<sup>3</sup>)=<math>W/1025</math>)</b>			
<b><math>9.8 * DSP^{(1/3)}</math></b>			
<b>RATING ( <math>L + 1.25*S^{0.5} - 9.8*DSP^{(1/3)}</math> ) / 0.679</b>			
Certificate No		Date	
Measurer		Signature	

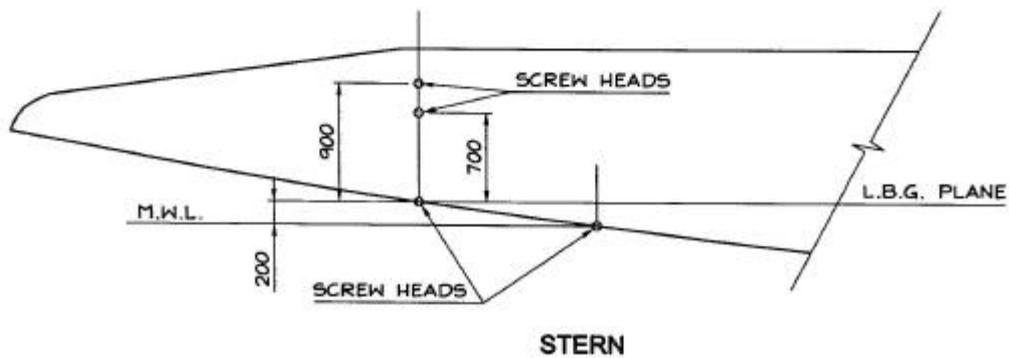
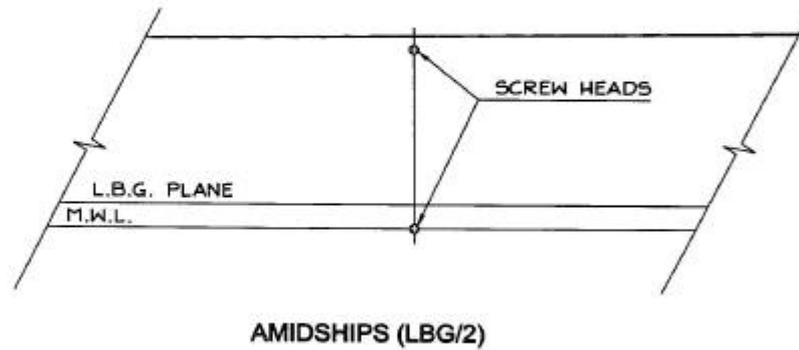
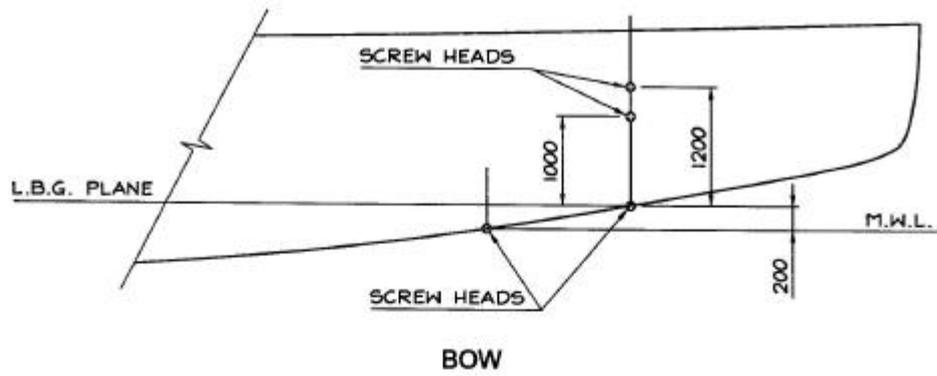
<b>RATING PENALTIES</b>			
		Page No	3 of 5
Yacht		Sail Number	
<b>FREEBOARD</b>			
Mean Freeboard at FLM			
Minimum Freeboard at FLM			
Deficiency			
Mean Freeboard at 50% LBG			
Minimum Freeboard at 50% LBG			
Deficiency			
Mean Freeboard at ALM			
Minimum Freeboard at ALM			
Deficiency			
Sum of Deficiencies			
FP ( Freeboard Penalties = Deficiencies * 4 )			
<b>DRAFT</b>			
Actual Maximum Draft			
Maximum Allowable Draft			
Excess			
DP ( Draft Penalty = Excess * 4 )			
<b>WEIGHT</b>			
Actual Weight			
Maximum Allowable Weight			
Minimum Allowable Weight			
Excess or Deficiency			
WP ( Weight Penalty = (Excess or Deficiency) * 4 )			
<b>BEAM</b>			
Actual Beam			
Maximum Allowable Beam			
Excess			
BP ( Beam Penalty = 4 * Excess )			
Certificate No		Date	
Measurer		Signature	

<b>SAIL AREAS</b>																											
Yacht		Sail Number	Page No 4 of 5																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%; padding: 5px;">Maximum Allowable Sail Area</td> <td style="width: 20%;"></td> </tr> <tr> <td colspan="2" style="padding: 5px;"><b>Foretriangle</b></td> </tr> <tr> <td style="padding: 5px;">I</td> <td></td> </tr> <tr> <td style="padding: 5px;">J</td> <td></td> </tr> <tr> <td style="padding: 5px;">Foretriangle Area</td> <td></td> </tr> <tr> <td colspan="2" style="padding: 5px;"><b>Mainsail</b></td> </tr> <tr> <td style="padding: 5px;">P</td> <td></td> </tr> <tr> <td style="padding: 5px;">BAD</td> <td></td> </tr> <tr> <td style="padding: 5px;">Maximum Allowable Mainsail Area</td> <td></td> </tr> <tr> <td colspan="2" style="padding: 5px;"><b>Spinnaker</b></td> </tr> <tr> <td style="padding: 5px;">Maximum Allowable Spinnaker Area</td> <td></td> </tr> <tr> <td style="padding: 5px;">Maximum Spinnaker Pole Length</td> <td></td> </tr> </table>				Maximum Allowable Sail Area		<b>Foretriangle</b>		I		J		Foretriangle Area		<b>Mainsail</b>		P		BAD		Maximum Allowable Mainsail Area		<b>Spinnaker</b>		Maximum Allowable Spinnaker Area		Maximum Spinnaker Pole Length	
Maximum Allowable Sail Area																											
<b>Foretriangle</b>																											
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J																											
Foretriangle Area																											
<b>Mainsail</b>																											
P																											
BAD																											
Maximum Allowable Mainsail Area																											
<b>Spinnaker</b>																											
Maximum Allowable Spinnaker Area																											
Maximum Spinnaker Pole Length																											
Certificate No		Date																									
Measurer		Signature																									

<b>FLOTATION</b>			
Yacht		Sail Number	
		Page No 5 of 5	
Actual Specific Gravity of Water			
Description and Location of Internal Ballast			
List of Other Items Onboard & their Position			
18 kg Anchor			
Anchor Chain			
Anchor Rope			
Battery			
Computer and Assoc Electronics			
Lifejackets			
Spares			
Spare Spinnaker Pole			
Designated Equipment at Flotation			
Mast			
Boom			
Spinnaker Pole			
Fin Strut			
Bulb			
Wings			
Rudder			
Trim Tab			
Certificate No		Date	
Measurer		Signature	

**MEASUREMENT MARKS**

Measurement marks shall be painted or fastened to the surface of the hull at measurement points as follows:



## HULL CONSTRUCTION DECLARATION

### **DESIGNER'S DECLARATION**

I, the designer of the yacht \_\_\_\_\_ declare that the hull has been designed and to the best of my knowledge, built, only from materials, and using building methods, as permitted in the America's Cup Class Rule.

Designer (Block Letters) \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

### **BUILDER'S DECLARATION**

I, the builder of the yacht \_\_\_\_\_ declare that the hull has been built only from materials, and using building methods, as permitted in the America's Cup Class Rule.

Builder (Block Letters) \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

### **OWNER'S DECLARATION**

I, the owner of the yacht \_\_\_\_\_ declare that the hull has been built only from materials, and using building methods, as permitted in the America's Cup Class Rule.

Owner (Block Letters) \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

This declaration is to be preceded by a completed material usage schedule as set out in Appendix D.

### **Office use only**

Certificate No. \_\_\_\_\_ Date \_\_\_\_\_

Technical Director \_\_\_\_\_

## COMPONENT DECLARATION

**YACHT** \_\_\_\_\_

**COMPONENT** \_\_\_\_\_ **DATE** \_\_\_\_\_

**DESIGNER'S DECLARATION**

I declare that the component named and referenced above has been designed and to the best of my knowledge, is constructed, only from materials, and using building methods, as permitted in the America's Cup Class Rule.

Designer (Block Letters) \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

**BUILDER'S DECLARATION**

I declare that the component named and referenced above, is constructed only from materials, and using building methods, as permitted in the America's Cup Class Rule.

Builder (Block Letters) \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

**OWNER'S DECLARATION**

I declare that the component named and referenced above, is constructed from materials, and using building methods, as permitted in the America's Cup Class Rule.

Owner (Block Letters) \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

This declaration is to be preceded by a completed material usage schedule as set out in Appendix D.

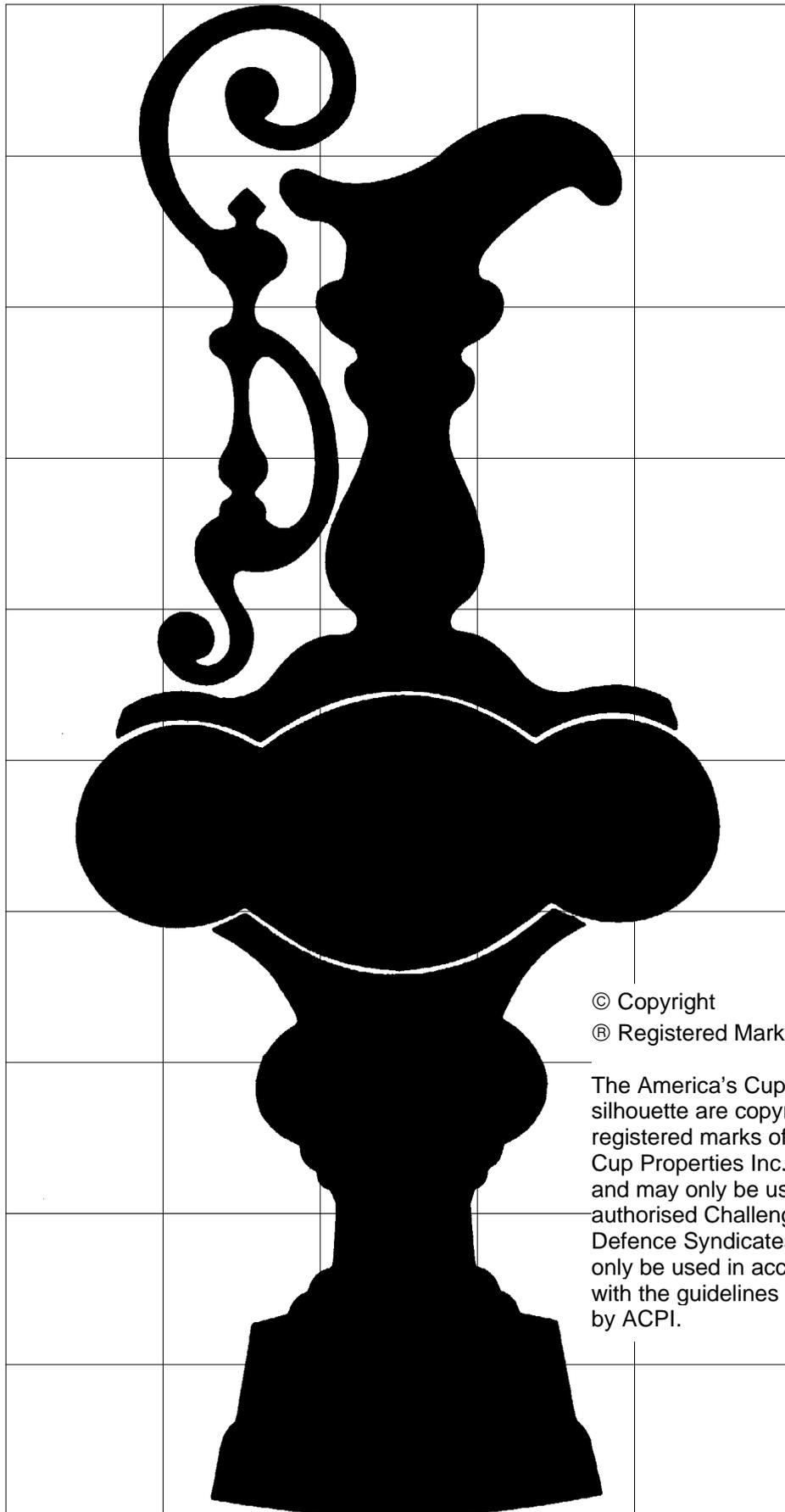
**Office use only**

Certificate No. \_\_\_\_\_ Date \_\_\_\_\_

Technical Director \_\_\_\_\_







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