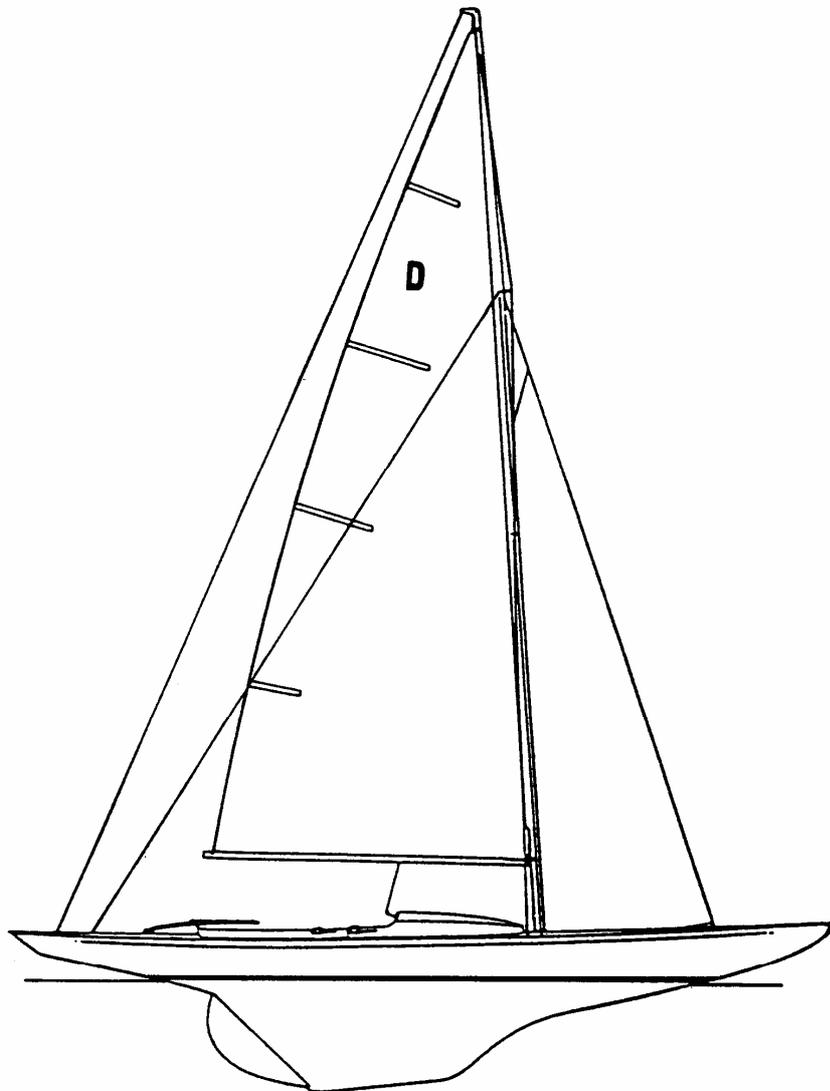




# 2008 INTERNATIONAL DRAGON CLASS RULES

Authority\*: International Sailing Federation



The International Sailing Federation (ISAF) is not a National Authority (NA)

### Nominal Principal Dimensions

<b>LOA</b>	<b>8.9m</b>
<b>Beam</b>	<b>1.95m</b>
<b>Draft</b>	<b>1.2m</b>
<b>Displacement</b>	<b>1700kg (with mast)</b>
<b>Mainsail</b>	<b>16m<sup>2</sup></b>
<b>Genoa</b>	<b>11.7m<sup>2</sup></b>
<b>Spinnaker</b>	<b>23.6m<sup>2</sup></b>

### LIST OF OFFICIAL PLANS

A separate Appendix containing Rules concerning carvel construction and wooden spars is available from the ISAF.

<b>Plan</b>	<b>Description</b>	<b>Date of Plan</b>	<b>Date of Amendment/Issue number</b>
1	Hull and Keel and Offsets	March 1990	November 1994, April 1997, Feb 2001 (Issue 6)
2	Keel Sections and Detail of heel	March 1990	November 1994 (Issue 4)
3	Template Plan	February 2001	(Issue A)
4	Construction plan - Wood	March 1990	June 1991, Feb/Mar 1992, July/Nov 1994 (Issue 5)
5	Construction plan - GRP	March 1990	July/November 1994, March 2002 (Issue 6)
6	Sail and Rigging Plan	March 1990	June 1991, Feb/Mar 1992, Nov 1994 (Issue 4) March 2002 (Issue 5), March 2005 (Issue 6)
7	Finished Keel Templates (Full Size)	March 1997	
8	Hull Offsets and Templates (Full Size)	February 1999	February 2001 (Issue C)

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*New or amended Rules in Bold*

## 1. GENERAL

The Dragon was designed in 1929 by Johan Anker of Norway

### 1.10 Purpose of the Class Rules

1.11 The intention of these Rules is to ensure that the boats have as identical a performance as possible. This shall be achieved by consideration of - but not exclusively - hull shape, weight, weight distribution and sail plan. The construction of the hull, and the spars, sails and rigging are controlled by these Rules. It is impossible to foresee every conceivable innovation, which may be thought of in the future, and to mention every suggestion that has been ruled illegal in the past. When considering anything in connection with the boat or its sails or equipment which involves the use of a material not accepted by the Class (as listed in the list of Permitted Materials referred to in the Note 2.502) or is not clearly covered by the plans or specification, you must assume that it is illegal, and shall submit detailed drawings through the IDA to ISAF to obtain a ruling before attempting it. The only exception to this rule is fittings, which are governed by Class Rules 8 and 12.

### 1.20 Authority

1.21 The international authority for the class is the ISAF, which will co-operate with the International Dragon Association (IDA) in all matters concerning these rules.

1.22 Neither the ISAF nor the International Dragon Association accept any legal responsibility in respect of these rules and plans or any claim arising there from.

1.23 In countries where there is no national yachting authority (NA), or the NA does not wish to administer the Class, its functions as stated in these rules shall be carried out by the IDA or its delegated representatives, a national Dragon class association.

### 1.24 Advertising

Advertising is only permitted in accordance with ISAF RRS Category A.

### 1.30 Language

1.31 The official language of the class is English and in the event of dispute over translation, the English text shall prevail.

1.32 The word "shall" is mandatory and the words "may" and "can" are permissive.

1.33 Wherever in these rules the words "class rules" are used they shall be taken as including the plans, diagrams and the measurement form.

### 1.40 Interpretation

1.41 These rules shall be read in conjunction with the official plans and measurement form. (Note: The Official Plans are listed at the beginning of these rules)

1.42 Departure of any kind from the plans is prohibited, unless either a plan of the proposed departure has been approved by ISAF, or it is authorised by these rules.

1.43 In the event of a discrepancy between the rules, measurement form or plans the matter shall be referred to the ISAF and the IDA.

1.44 Any interpretation of these rules shall be made by the ISAF, which shall consult the IDA.

### 1.50 Measurement and Measurers

1.51 Except where other methods of measurement are specifically indicated all measurement shall be carried out in accordance with the ISAF Measurement Instructions.

- 1.52 Only a Measurer nominated by a National Authority and approved by the IDA shall measure a yacht, its spars, sails and equipment, and sign the declaration on the measurement form. After consultation with the National Authority however, the IDA may approve one or more individuals within a sail loft or spar maker to measure sails and spars manufactured by that manufacturer.
- 1.53 A Measurer shall not measure a yacht, its spars, sails or equipment owned or built by himself, or in which he is an interested party, or has a vested interest, however, measurers within a sail loft or spar maker as stated in Rule 1.52 are excluded for sail and spar measurement only
- 1.54 New or substantially altered sails shall be measured by a measurer who shall stamp, sign and date the sails.
- 1.55 The Regulations for Hull Template procedure, Stem Template Procedure and Swing Test Procedures are part of these rules. Templates used for measurement shall be made accurately to the official plans; the table of offsets and designs supplied by ISAF shall be approved by the IDA Chief Measurer and registered with ISAF. From 01 March 2001 they shall be produced by a manufacturer appointed by the IDA. The Measurer shall check the compliance of the templates with Plan 8c and shall report any later departure immediately to the IDA.
- 1.60 Application of Rules and Re-measurement
- 1.61 Spars, rigging and sails shall comply with the current rules at all times. Hull (including deck, cabin, internal moulding and all other components), keel and rudder shall comply either with the current Class Rules or those in force when the yacht was originally measured.
- 1.62 Re-measurement may be carried out on the instructions of ISAF, a National Authority, IDA or a race committee except that re-measurement of the hull shall only be permitted if there is reason to think that the yacht has been measured incorrectly before the measurement certificate was issued or that the yacht was not re-measured after a major repair, a major renovation or an alteration.
- 1.63 Before a yacht is subject to a major repair, a major renovation or an alteration the IDA Technical Committee shall be consulted prior to any work being undertaken. In all these cases the yacht shall be considered to have been altered unless the owner or builder is able to establish that the yacht has not been altered in the course of the work undertaken.
- 1.64 In all cases subject to rule 1.63 the yacht shall be fully re-measured in accordance with the rules as stated in rule 1.61 except that the yacht shall be re-measured in accordance with the current rules if it has been altered.
- 1.65 Adjustment of any of the corrector weights shall be made only after:
1. the yacht has been officially reweighed by an official measurer with a scale that has been officially certified within the preceding twelve months, and
  2. the hull has been swung or re-swung in accordance with rule 10.20.
  3. the yacht does not have to be swung under rule 1.65.2 after the removal of corrector weights provided the corrector weights were removed within 300 mm of station 8.

When a yacht is reweighed and reswung under rule 1.65 any or all of her corrector weights may be removed

Reweighting may take place under the requirements of rule 1.64 or on the owner's instructions. When a yacht is reweighed and reswung under rule 1.65 any or all of her corrector weights may be removed or amended. However the penalty weights (of 4 x 7.5kg) fitted to certain boats (as listed by the ISAF in December 1988) may not be removed at any time.

The official measurer shall enter revised details of the corrector weights on the measurement certificate, which shall be sent by the owner to his National Authority for re-validating and re-issuing. The owner shall also send a copy to the IDA.

- 1.70 International Class Fee

- 1.71 An International Class Fee (ICF) as prescribed by ISAF shall be paid on each yacht built. This amount shall be paid to the ISAF which shall issue an official International Class Fee Receipt and, for yachts first registered after 1st March 1986, an ISAF sticker. Yachts first registered after 1st March 1990 shall have the ISAF sticker permanently fixed on the inboard face of the starboard cabin side or for yachts with bulkheads the plaque may be fixed adjacent to the sail numbers (see rule 2.18).
- 1.72 The ISAF is responsible for the collection and distribution of the ICF.
- 1.73 The ICF is payable by the builder on each boat built, whether or not it is subsequently measured and registered. The ICF receipt shall be delivered by the builder to the owner on sale of the boat.
- 1.74 ICF receipts shall be valid only if made out on official receipts by the ISAF.
- 1.75 The ICF Receipt number or ISAF sticker number shall be entered on the yacht's measurement certificate.
- 1.80 Measurement Certificate
- 1.81 No yacht shall take part in class races unless it has a valid measurement certificate and its owner is a current member of a national Dragon association.
- 1.82 A valid measurement certificate is an original or copy of the measurement form which has been stamped by a NA or is a special measurement certificate issued by a NA.
- 1.83 To obtain a Measurement Certificate:
- .1 The builder pays the ICF to ISAF who will issue an official ICF receipt and sticker.
  - .2 The owner shall apply to his NA for a sail number. [Each country shall issue sail numbers which shall be consecutive beginning from one. The number shall be preceded by the national letter(s). Each number shall be used once only.]
  - .3 An official measurer shall measure the yacht and complete a measurement form. The Declarations shall be signed by the builder and the official measurer.
  - .4 The owner shall send the measurement form when signed by the builder, the official measurer and himself to his National Authority together with any registration fee required.
  - .5 On completion of the above the NA may issue a Measurement Certificate.
- 1.84 Change of ownership invalidates the certificate. It shall be returned to the new owner's National Authority together with an application containing the name, address and club of the new owner and any re-registration fee that may be required. A certificate shall then be issued to the new owner. Re-measurement shall not be necessary.
- 1.85 Before a yacht may race a copy of the completed and signed Measurement Form shall be supplied to the IDA Secretary by the Builder. If the boat is not yard finished this copy shall be supplied by the Owner.
- 1.90 Owner's Responsibility
- 1.91 It is the responsibility of the owner to see that his yacht, spars, sails and equipment comply with the class rules and relevant Racing Rules of Sailing at all times and that alterations, replacements or repairs to the yacht, spars, sails or equipment do not invalidate the measurement certificate.
- Note: Alterations, repairs or replacements which are not re-measured may invalidate a yacht's certificate.

## **2. HULL AND DECK**

### 2.10 General

#### 2.101 Builders:

Dragons shall only be constructed by builders licensed by ISAF. Sub-contracting is permitted provided the ISAF and the IDA have been informed in writing beforehand. The licensed builder is solely responsible for ensuring the class rules are complied with.

The builder shall permit the measurer to inspect the work at any time during its progress.

A one-boat licence is available for those builders or sailors wishing to build one boat only or to complete the decking of any hull. Under this licence the building work must be inspected regularly by the Official Measurer.

- 2.102 Three samples of not less than 0.0625m<sup>2</sup> of any construction and a specification of its individual components shall be supplied to the IDA for checking that it complies with the Class Rules. One sample of the construction shall be returned, stamped as approved, and signed by the Technical Officer of the ISAF and one of the following:
- (a) Chairman of the IDA Technical Committee,
  - (b) IDA Chief Measurer,
- to the Builder and be available for measurement of hulls.
- 2.11 The yacht shall be constructed in one of the following ways:
- carvel planked in accordance with class rule 2.20 (1989 edition) and subject to prior approval from the ISAF for each boat built or,  
cold moulded plywood (see rule 2.30), or  
strip plank (see rule 2.40), or  
glass reinforced plastic (see rule 2.50).
- 2.12 Except as specifically stated in these rules combinations of the different methods of construction are prohibited. (See rule 2.5.14) Where particular kinds of wood are mentioned, other kinds of wood may be used provided they have specific weights and durability not less than those specified.
- 2.13 The shape of the hull shall be measured at stations 2,4,6,8,10,12 and 14 with templates in accordance with rule 1.55. The builder shall ensure that the shape of the unmeasured hull stations does not vary from the dimensions given on the table of offsets and the lines body plan by more than +/-0.5% of the half station circumference (rounded to the next higher mm). This rule will apply from 01 March 2001, except for GRP boats to which it will apply from 01 March 2002.
- 2.14 Stations are spaced at 600mm.
- 2.15 Stations 2, 4,6,8,10,12 and 14 shall be permanently marked (by screws in a wooden hull or countersinks in a GRP hull) on the covering board and in the hull just above the ballast keel at stations 6, 8 and 10 on both of the yacht, and on the centreline of the stem (at stations 2 and 4), and on the counter (at stations 12 and 14).
- 2.16 The transom shall be flat. A hollow or round not exceeding 2mm from the straight will not be considered a contravention of this rule. The transom shall slope forward from the centre of the deck to the intersecting point at the centre line of the hull. Slope 320mm +/- 10mm.
- 2.161 The round (camber) of the top of the deck shall not exceed 9.5mm per 305mm of the width of the boat at that location (e.g. at station 6 where the yacht's beam is 1834mm the round shall not exceed 58mm).
- 2.162 The rounding of the outside edge of the deck at sheerline and transom shall not exceed a radius of 9mm. A toe rail is permitted on deck. It shall be limited to within 50mm from the sheerline and to 20mm above the deck. All edges shall be rounded. Fixed and removable seats outside the cockpit coaming are prohibited.
- 2.17 Two lifting eyes shall be attached to the keel, keel bolts or to the sides or undersides of the floor timbers. The weight of each lifting eye shall not exceed 3kg.
- See Rule 10.21(e) and drawing.
- 2.18.1 The ISAF plaque number of the yacht shall be carved either on the rear bulkhead or in the starboard inner hull side forward of the aft bulkhead above the internal moulding. The numbers shall be clearly visible, not less than 50mm in height and carved to a depth of not less than 2mm.
- 2.18.2 For yachts first measured prior to 1 March 1995 either the plaque number or the national letter(s) and sail numbers shall be carved as specified in 2.18.1.
- When a yacht is issued with a new sail number it shall be indelibly marked next to the original sail number (unless the ISAF plaque number is carved as above).
- 2.18.3 For yachts without bulkheads the ISAF plaque number (or National Letter(s) and sail number) shall be carved in the horn timber of a wooden hull or in the equivalent position in a GRP hull.

2.19 Buoyancy tanks, bags or compartments are permitted.

**2.191 All Dragons first measured after 1st March 1991 shall have a minimum of 1,400 litres positive buoyancy.**

**All Dragons first measured after 1st March 2000 shall have a minimum of 1,700 litres positive buoyancy.**

**All Dragons, with the exception of those build in timber, first measured after 1<sup>st</sup> March 2008 shall have a minimum of 2500 litres positive buoyancy.**

**The buoyancy may consist of buoyancy tanks and/or closed cell polyurethane foam with a minimum density of 32 kg/m<sup>3</sup>.**

**Each new type of Dragon, first measured after 1st March 2008 shall pass a test, where the hull in racing condition, but without sails, shall be inclined to 90 degrees for not less than 1 minute. After this time, the boat shall come upright and float for not less than 30 minutes with no part of the deck submerged. The test shall take place with either an IDA officer or measurer present.**

**The Builder shall issue a “Declaration of Buoyancy” for each Dragon built after 1<sup>st</sup> March 2008, stating the type, capacity and location of the various watertight compartments and the total buoyancy, when the cockpit and cabin area has been swamped.**

**2.192 Watertight bulkheads shall be positioned within 300mm of stations 5, and 12. The bulkheads may be of timber or any sandwich construction. Watertight inspection hatch(es) shall be fitted. The weight of each hatch shall not be greater than the part of the bulkhead which they replace. Substantial fastening devices for the hatches shall be permanently fixed to the bulkhead.**

**Any hatch to any watertight compartment shall be closed while racing. A means of pumping the fwd and aft watertight compartments clear of water shall be fitted, this shall be capable of being operated from the cockpit. Non-return valves, draining in to the main bilge, shall be fitted to any watertight bulkhead and compartment, except when it is filled with foam. Holes for control lines passing through any watertight bulkhead shall be no further than 100mm from the underside of the deck.**

2.20 Carvel Planked Construction

The requirements for a carvel planked yacht are available from the ISAF as a separate appendix.

2.21 Carvel planked yachts constructed before 01 January 1988 may be reinforced in the same manner as permitted for GRP boats under Rule 2.515.2 and Rule 2.515.6(a)

2.22 Carvel planked yachts more than 20 years old may be sheathed externally with GRP cloth. This layer shall not exceed 2mm thick.

2.30 Cold Moulded Construction

2.31 The wood keel, stem and horn timber (centreline structure) and frames, shall be laminated from timber weighing between 530kg/m<sup>3</sup> and 575kg/m<sup>3</sup> (This weight bracket includes Khaya, Honduras and West African mahoganies). The thickness of the centreline structure shall not be less than 60mm or more than 65mm, but may be increased to 80mm from station 2 forward. The deadwood shall be in accordance with the plans. The deadwood shall be of oak or pine.

The width of stem and stern timbers shall be @ station 2: minimum 80mm, @ station 5 minimum 120mm, @ station 12 minimum 120mm, @ station 14 minimum 100mm.

2.32 The hull-skin shall not be less than 16mm thick and shall consist of not less than 3 layers of wood of weight not less than 535kg/m<sup>3</sup>. The weight of the hull skin including glue shall not to be less than 12kg/m<sup>2</sup>. Underwater coating may contain glass fibre but not more than 150g/m<sup>2</sup>.

2.33 Two frames between stations 5 and 6 and one further frame between stations 11 and 12 are mandatory; their dimensions shall not be less than 50mm x 30mm. These frames shall be of wood and may be laminated.

2.341 The transom shall be of oak or mahogany not less than 20mm thick.

2.342 Floor timbers shall be oak, sided 70mm, for the length of the ballast keel and 50mm beyond the keel. For one

half of their length the siding may be tapered down to 46mm.

- 2.343 The mast step shall be of oak 1350mm x 150mm x 60mm. The siding shall not be less than 150mm throughout although its moulding may be tapered as shown on the official plans.
- 2.344 The shelf shall be of Scandinavian pine or fir, larch or Oregon pine, 27mm x 100mm or 24mm x 115mm.
- 2.345 Beams and the carling shall be of larch, Scandinavian pine or fir, or Oregon pine of the following dimensions:  
Spacing of beams shall not exceed 254mm centre to centre.

Mast beams and beams at the end of the cockpit and cabin top openings: 40mm x 60mm at the centreline reducing to 40mm x 40mm at the sides.

Complete beams between stations 3 and 13: 30mm x 45mm at the centreline reducing to 30mm x 30mm at the sides.

Half beams at the sides of the cockpit, etc: 25mm x 38mm at the inboard ends reducing to 25mm x 25mm at the sides.

Beams forward of station 3 and aft of station 13: 25mm x 38mm at centreline reducing to 25mm x 25mm at the sides.

The carlings shall be a minimum of 50mm x 40mm

- 2.346 The deck shall be of larch, Scandinavian pine or fir, Oregon pine, spruce, or plywood, not less than 14mm thick and weighing not less than 432kg/m<sup>3</sup> and covered with canvas of not less than 236g/m<sup>2</sup> and painted, or covered with any other material of equivalent weight.
- 2.347 The deck may be of plywood, or plywood overlaid with teak, of not less than 15mm total thickness and weighing not less than 7.6kg/m<sup>2</sup>.
- 2.348 A covering and/or margin board may be fitted.
- 2.350 The cabin sides shall be of mahogany not less than 16mm thickness, and the cabin top shall be of wood or plywood (type optional) not less than 10mm thick. The cabin top may be covered with canvas or other material.

A covering board of optional width is permitted round the cabin top.

## 2.40 Strip Plank Construction

Yachts first measured after 1st March 1992 may be constructed by the strip plank method of a single skin. Strip plank construction shall be the same as for cold moulded construction except for the following: The hull shall be a minimum 20mm thick and shall be of minimum 11.25kg/m<sup>2</sup> excluding frames. Minimum weight of planking timber 360kg/m<sup>3</sup> (will allow Western Red Cedar). Laminated frames of timber of minimum weight 530kg/m<sup>3</sup> shall be fixed at every station (i.e. 600mm) plus two additional frames between stations 5 and 6. The frames shall be of minimum sizes:

Station 1,2,3,13,14 = 22 x 25mm

Station 5,6,7,9,10,11 = 25 x 30mm

Station 4,8,12 and additional 2 frames between 5 and 6 = 30 x 34mm

The beam shelf may be attached to the hull side and the frames shall be notched into or over the beam shelf to maintain structural integrity. Where the beam shelf is placed inside the frames a filling piece, minimum 100mm in length shall be fixed between each frame.

## 2.50 Glass Reinforced Plastic Yacht

### 2.501 General

These rules permit the construction in glass reinforced resin (GRP) and are supplementary to, and shall be read in conjunction with the official plans.

### 2.502 Materials

- 1 Long strand glass fibre material shall be used together with a rigid high strength, low-water-absorption-rate thermosetting resin (except epoxy). A schedule of permitted materials will be available on request from the

IDA. No other materials may be used without the written consent of the IDA. A non-woven, fleece made only out of fibres may be used when a closed mould vacuum method is being employed. Maximum two layers of 180 grammes /sq metre maximum each layer may be used. If any fleece is being used it shall be consistent for the full length of the moulding.

- .2 The glass content of the combination shall be not less than 30% of the total weight.
- .3 Unless otherwise specified the glass reinforcement shall be uniformly distributed over the whole of the moulding.
- .4 The IDA/ISAF may take core samples in order to establish correlation between hull and deck construction and the samples submitted.

#### 2.503 Hull Shell

The weight of the exterior hull moulding shall be not less than 12kg/m<sup>2</sup> and the total weight of the exterior hull moulding, measured to the sheerline only, shall not be less than 248kg. If a deck flange or covering board is attached to the exterior hull moulding the weight of this shall be deducted from the exterior hull moulding weight.

#### 2.504 Keel Reinforcement

The centreline of the hull shell moulding shall be reinforced in way of the stem, keel and stern with additional glass and resin. The keel reinforcement shall extend from the centreline of the yacht, for a distance, g around the girth, to a point, d, minimum 250mm from the centreline (see diagram on 23)

The laminate shall be of uniform thickness below a point ½g minimum distance from the centreline. Above the ½g distance the laminate shall reduce uniformly to the upper limit of the reinforcement. The weight of glass and resin shall be evenly distributed along the centreline. The total weight of the keel reinforcement shall be 70kg ± 7kg

#### Example of Construction

Stations	Total Weight of keel laminate kg/station (excludes weight of hull shell)	Area up to d One side m <sup>2</sup>	Total Area of 450g Glass use m <sup>2</sup>	Suggested number of layers 450g glass at maximum thickness
0-1	1.4	0.12	0.9	5
1-2	3.5	0.22	2.3	7
2-3	3.5	0.17	2.3	9
3-4	3.5	0.15	2.3	10
4-5	4.2	0.15	2.8	12
5-6	4.5	0.15	3.0	13
6-7	5.3	0.18	3.5	13
7-8	6.8	0.23	4.5	13
8-9	8.9	0.30	5.9	13
9-10	11.0	0.37	7.3	13
10-11	7.2	0.29	4.8	11
11-12	3.6	0.18	2.4	9
12-13	2.4	0.15	1.6	7
13-14	2.1	0.15	1.4	6
14-15	1.8	0.15	1.2	5

## 2.505 Internal Moulding

The upper part of the moulding shall not be below a continuous fair curve between the minimum points on each side of the hull, nor shall it extend higher than 200mm below underside of deck, with the following exception.

Between the bulkhead near station 5 and 8 the inner moulding may extend higher, provided it forms a watertight compartment.

Between the bulkheads near stations 8 and 12, the inner moulding may extend to the lower edge of the cockpit coaming and be joined with it, provided it forms a watertight compartment.

2.506 Mast Step: The mast step shall be incorporated in the interior hull moulding and shall not be less than 500mm long and connected to not less than 3 floors. The other dimensions of the mast step are optional.

## 2.507 Floors

A minimum of 8 floors shall be fitted. The maximum spacing between adjacent floors shall be 700mm. The floors shall extend up to the underside of the cabin sole.

The floors shall be of a uniform laminate of 7.5kg/m<sup>2</sup>. The floors shall be bonded to the hull with a laminate of not less than 6kg/m<sup>2</sup>.

Floors supporting the mast may be connected by longitudinal members. Any longitudinals shall, including any bonding flange, not extend more than 100mm forward of station 4 or exceed 350mm in width. The distance between the top of any longitudinal and the underside of the deck shall not be less than 650mm.

## 2.508 Weight of Internal Hull Mouldings

The total weight of the internal moulding, mast step, floors, excluding bonding and/or bedding laminates shall be not less than 58kg nor more than 72kg (80kg if bulkheads are included in the internal moulding). When the inner moulding is joined to the cockpit coaming, in accordance with CR. 2.505.3, the total weight of it may increase by 5kg.

## 2.509 Deck, Coamings and Cabin

The deck shall be of balsa or foam sandwich construction of minimum weight 9kg/m<sup>2</sup>.

If the core is of balsa its thickness shall not be less than 12mm and its density shall not be less than 130kg/m<sup>3</sup>.

If the core is of foam its thickness shall not be less than 15mm and its density shall not be less than 80kg/m<sup>3</sup>.

The internal and external laminates shall each comprise a minimum of 3 layers of glass. The total weight of glass and resin on each side of the core shall be not less than 3kg/m<sup>2</sup>.

Four deck beams shall be fitted the full width of the deck moulding less 60mm in each end, one in each of the following positions:

Station 4

Between Station 5 and the mast

One immediately aft of the mast

One between the aft end of the cockpit and Station 12

The weight of the beam laminate shall not be less than 4kg/m<sup>2</sup>.

The beams shall have a balsa or foam core of density not less than 80kg/m<sup>3</sup>.

The beams shall be of constant depth over 70% of their length. Outside that limit beams may be uniformly tapered.

Minimum dimensions of the beams shall be:

Centre 70%

Ends

width at underside of deck	70mm	50mm	
width of top	50mm	40mm	
depth	50mm	20mm	(see diagram on page 22)

The deck beams shall be laminated to the underside of the completed deck moulding by a laminate of not less than 3kg/m<sup>2</sup> giving a minimum weight on the face of the beams of 7kgm<sup>2</sup>. This laminate shall extend not less than 30mm from each side of the deck beam nor more than 50mm.

The internal and external laminates shall each comprise a minimum of 3 layers of glass. The total weight of glass and resin on each side of the core shall be not less than 3kg/m<sup>2</sup>.

Additional laminates, minimum 3kg/m<sup>2</sup>, shall be used in way of mast, rigging and other high stress areas to strengthen the moulding.

Plywood or foam of min. 200kg/m<sup>3</sup> or multiple polyester matt crush pads shall be fitted in way of winches, forestay, mast, shrouds, rudder, cleats and sheaves.

2.510 The total weight of the complete deck, coamings and cabin top shall not be less than 116kg.

Any covering board laminated to the exterior hull shell which forms an integral part of the deck shall be included in the 116kg.

The specification for the cabin top and sides and coaming shall be the same as for the deck or may be of solid glass with a minimum weight of 9kg/m<sup>2</sup>

2.511 The deck may have recesses in way of the headsail furling device and backstay turning blocks with a cover plate at deck level above the recess. The cover plate must be of at least the same weight per m<sup>2</sup> as the deck, and must be permanently secured. Running rigging passing through watertight spaces (e.g. bulkheads) may be led through ducting or tubing no lower than 300mm under the deck. The opening for the spinnaker tube, if used, shall be not more than 520mm below the deck. This ducting or tubing may be incorporated into the deck construction.

2.512 Bonding Hull to Deck

The deck and hull shall be bonded together and reinforced with a laminate, which is uniformly distributed longitudinally. The total weight of this bonding laminate shall be not less than 21kg. It is permitted to use foam within this laminate, provided this foam does not extend more than 50mm below the sheerline.

The width of each successive layer of glass in the bonding laminate shall be less than the previously applied one in order to reduce local high stress points.

The weight of any flange from the hull moulding (on top of which the deck will be laid) shall be included in the 21kg.

Additional support for the deck moulding shall be provided at the aft end of the cabin by including either plywood knees or partial bulkheads.

2.513 Weight of Assembled Hull and Deck Mouldings

The weight of the completed hull and deck mouldings shall not be less than 520kg or 528kg if bulkheads are included as an integral part of the internal moulding.

2.514 A wooden cabin top and sides may be permitted subject to prior approval being obtained from the ISAF of details of its connection to the GRP cabin sides.

Wooden coamings in accordance with the rules for the cold moulded yachts may be permitted subject to prior approval being obtained from the ISAF of the details of their connection to the GRP deck.

A wooden deck, in accordance with the rules for the cold moulded yacht may be permitted subject to prior approval being obtained from the ISAF of the details of its connections to the GRP hull. (Note: For the purpose of this rule the covering board can be considered to be part of the deck)

Deck Beams between Station 5 and the mast and between Station 12 and the aft end of the cockpit may be replaced by bulkheads, provided that the flanges connecting the bulkhead to the deck are of minimum 40mm width Alternatively a curved deck beam may be fitted at either or both of the aforementioned positions if the deck beam would otherwise intersect a bulkhead

A GRP cabin and coaming may be added to a wooden deck on a GRP hull subject to prior approval from the ISAF.

2.515 Additional reinforcement of a yacht with a GRP hull shall only be of wood, foam and/or GRP in accordance with which only the following may be fitted.

- .1 Between stations 5 and 6:
  - (a) Two internal frames each not exceeding 60mm thick x 150mm deep except within 510mm of the sheerline.
  - (b) Two additional deck beams each not exceeding 60mm thick x 75mm deep measured from the underside of the deck. (Note: These beams are in addition to those specified in rule 2.509). Alternatively, the existing deck beams may be enlarged to 60mm x 75mm.
- .2 (a) Forward of station 6 a longitudinal partial bulkhead and one internal athwartships partial bulkhead, each not more than 70mm thick.
  - (b) Aft of the cockpit a longitudinal partial bulkhead not more than 70mm thick.

For all new boats the weight of the forward and aft bulkheads may be included in the weight of the keel reinforcement under rule 2.504.

**(c) Partial bulks in way of the mainsheet arrangement and within 300mm of station 8. If the cabin and/or cockpit floor and/or sides tanks are forming buoyancy compartments, the bulkhead shall be watertight to each adjacent compartment.**

**The bulkhead may be watertight above the cabin floor on each side, have a doorway and means to be closed watertight.**

- .3 Between stations 11 and 12 not more than one deck beam and/or internal frame with associated knee not exceeding the equivalent measurements as stated above. Alternatively, the existing deck beam may be enlarged to the equivalent dimensions.
- .4 Where the forestay and the runners or their extensions meet the hull shell, brackets may be fitted for the attachment of the headstay / roller furling fittings and runner turning blocks. The length of the forestay or runner brackets athwartships or longitudinally shall not exceed 600mm each. The brackets shall only be made of wood, GRP, metal or a combination of these.
- .5 Deadwood: The space below the floorboards between the forward edge of the rudder stock and the bottom of the hull shell moulding at station 9 may be filled out with closed cell polyurethane foam, which shall be covered with laminate. Tubes may be fitted for access to any fitting on the front of the rudder stock.
- .6 For yachts constructed prior to 1st January 1988 further stiffening is permitted as follows forward of the cabin and aft of the cockpit:
  - (a) Two aluminium tubes maximum diameter 50mm from the underside of the deck to forestay and backstay positions (two tubes forward and two tubes aft are permitted), and/or,
  - (b) Two foam stringers maximum section 50mm x 50mm may be bonded to the hull. Position optional. Two forward and two aft. Maximum width of bonding shall be 100mm either side of the stringer.

#### 2.516 Measurement

- .1 The builder shall weigh each moulding in order to satisfy himself that the weights specified in this rule have been attained.
- .2 The measurer shall satisfy himself, as far as he is able, that the yacht complies with the requirements of these rules.

### 3. CABIN, COCKPIT AND HATCHES

#### 3.10 Cabin

3.11 The length of the top of the cabin top shall not be less than 1000mm.

3.12 The aft end of the cabin top and the forward end of any cabin hatch shall not be forward of Station 8. The cabin top and cleat beam shall not extend more than 150mm aft of Station 8.

- 3.13 The height of the sides of the cabin above the top of the deck, shall not be less than 180mm at station 8. The arch of the cabin top measured at the same station shall not be less than 100mm. (see diagram on page 22)
- 3.14 The shape of the cabin is optional. Its breadth 1000mm from station 8 shall not be less than 500mm. At points 250mm either side of the centreline, at the section 1000mm forward of station 8, the height of the cabin shall be not less than 80mm measured vertically above the deck.
- 3.15 The cabin may be totally enclosed. The internal arrangements of the cabin and cabin fittings are optional.
- 3.20 Cockpit
- 3.21 The arrangement and layout of the cockpit are optional, except that:
- 3.22 The cockpit shall not extend forward of station 8 nor further aft than 200mm forward of station 12.
- 3.23 The width of the side deck outside the cockpit shall not be less than 300mm.
- 3.24 The height of the cockpit coaming aft of the cabin shall not be less than 100mm.
- 3.25 The cockpit coaming shall fair into the cabin sides. Any trim fitted on top of or on the outside of the coaming shall not extend outboard of the outer face of the coaming by more than 30mm. Any such trim shall not be considered as seats as used in Rule 2.162.
- 3.26 Helmsman's and crew seats, if fitted, shall only be of wood, GRP, sandwich construction, metal or a mixture of these.

#### 3.30 Hatches

- 3.31 One hatch forward of the mast is permitted. If fitted it shall not exceed 508mm x 508mm and it shall be properly framed, and have a hinged or sliding cover so constructed that it is retained permanently between the slides. It shall be capable of being secured in the closed position. The hatch cover shall not be less in weight than that of the deck it replaces.**

**If used as Spinnaker launching hatch, a watertight spinnaker chute shall extend from below the hatch to the bulkhead near station 5 and to the bulkhead at station 8 if fitted.**

**The chute shall be rigid from the hatch to the bulkhead at station 5 from there the chute may be flexible.**

**The inner diameter of the rigid part of the chute from aft of the hatch shall not exceed 300mm.**

**The material of the chute is optional.**

#### 3.40 Floorboards

- 3.41 Floorboards shall not exceed 16mm in thickness and shall be of timber or GRP. Floorboards forward of the bulkhead near station 8 may be sealed to form a watertight compartment.**

**Floorboards between stations 9 and 8 may create watertight compartments, but shall not be sealed for a minimum width of 500 mm. Note: - The original floorboards in boats laid down before 15th November 1958 may be retained.**

- 3.42 The area of floorboards shall not be less than 0.2m<sup>2</sup>**

- 3.43 The weight of the floorboards and stiffeners shall not exceed 40kg in a wooden hull and 15kg in a GRP hull.

## 4. BALLAST KEEL

- 4.10 The ballast keel shall be cast iron, except that a separate bronze casting is permitted for locating the rudder stock in the keel. Uneven surfaces or blow holes shall not be filled with lead. Fairing shall not alter the general shape, curvature or rounding of the keel.

- 4.20 The weight of the iron keel shall be minimum 1000kg, maximum 1020kg including keel bolts or studs and any finishing.

- 4.30 The iron keel shall be weighed and a certificate of its weight issued. This weight shall be recorded on the measurement form.
- 4.40 The iron keel shall be measured and templates (Drg. No.3) applied at stations 5(a), 6, 6(a), 7 and 8.
- 4.50 The template stations 7, 6(a), 6 and 5(a) are to be positioned by reference to the aft end of the keel, where it joins the hull. The distance of station 7 from that point shall be 1925mm, measured along the top surface of the keel. The other template stations [6(a), 6 and 5(a)] are to be found by measuring along the top of the keel 304mm for each station as indicated on the diagram on page 22.
- 4.60 Station 8 on the keel (1317mm from its aft end measured along the top surface) shall be within 5mm of the station 8 mark on the hull on all boats built and measured after 1st March 1988.
- 4.70 The templates (Drg. No.3) shall be applied with the top of the templates level with the top of the iron keel. The clearance between the templates and the iron keel shall not exceed 8mm.
- 4.80 The aft end of the keel shall have a hollow locating round the rudder. This hollow may be constructed by metal non-flexible flaps not less than 3mm thick but shall produce a hollow of equal depth to that shown on the plans.
- 4.90 Finished keel templates (Plan 7, issued March 1997) shall be applied to the keel after it is fitted to the hull and any coatings have been added. The templates shall be applied with the top of the templates level with the top of the iron keel. The clearance between the surface and the templates shall not be more than 10mm. At section 9a the keel shall comply with the radius templates (Plan 7, issued March 1997). Boats first measured before 1<sup>st</sup> March 1997 need not comply with the templates at Section 9A, but the radius at the bottom of the keel at this section shall not be less than 12mm.

## **5. RUDDER AND TILLER**

- 5.10 The rudder shall comply with the measurement diagram. Plans 4 and 5. (See diagram on page 23).
- 5.20 The rudder shall be of wood or GRP. The maximum thickness of the rudder blade shall not exceed 45mm. The position of maximum thickness shall be forward of the mid-point of the chord length. There shall be no concavity in the surface of the rudder. If made of GRP, closed cell foam with a minimum density of 80kg/m<sup>3</sup> or balsa may be used as sandwich material.
- 5.30 The rudder stock shall not be less than 25mm diameter of solid steel or bronze.
- 5.40 The rudder pipe shall be of the same material as the rudder stock or GRP except that a short length of plastic or rubber tube may be used to connect the upper and lower sections of the rudder pipe in a GRP yacht.
- 5.50 The tiller shall be above the deck and shall not be of divided or hooped design. It shall only be made of wood, GRP, metal or a combination of these. The material of the tiller extension is optional.
- 5.60 The weight of the rudder, including its stock and fittings, shall be not less than 11kg and not more than 17kg.

## **6. SPARS**

- 6.10 Mast - General
- 6.101 The mast shall be made of either one kind of wood or of aluminium alloy. Wooden spars shall be constructed only after prior approval from ISAF in accordance with Class Rules 6.30 (1989 edition) (available as a separate appendix from the ISAF). Each mast manufactured or measured after 1<sup>st</sup> March 2006 shall have permanently attached to it approx 100mm below the deck filling piece on the starboard side of the spar, an official IDA label, on which the masts particulars, in accordance with Rule 6.112 paragraph 1, shall be entered. The manufacturer shall punch or engrave his code number and the number of the spar through this label after it has been fixed to the spar to ensure that it cannot be transferred to any other spar. Labels shall be available from the IDA Assistant Secretary.
- 6.102 The fore and aft position of the mast is optional, except that it is prohibited to make changes while racing. The heel of the mast shall be fixed and not be capable of being moved while racing. However free movement of not more than 10mm shall not be considered as infringing this rule. Any device which enables movement is prohibited.

- 6.103 A mark ( made from metal or plastic plate) 50mm measured fore and aft and 20mm athwartships shall be fixed on the deck on each side of the mast opening, in such a position that the foreside of the mast shall not be outside nor be capable of being moved outside the limits of these marks. (see diagram on page 22).

Movement of the mast within these limits shall be restricted by either:

- (a) A mast ram (or controller) permanently fixed in such a way that total fore and aft movement of the ram (other than by adjustment of bottle screws) restricts the mast to within these limits. Any adjustment of mast ram bottle screws or other devices which results in the mast being capable of movement outside these limits is prohibited.

or

- (b) Chocks (or other filling pieces) fixed in such a way that they cannot be removed with the mast in place or otherwise fixed by means of screws (which shall not be removed during racing).

Athwartship clearance of more than 10mm each side is prohibited. Any filling pieces limiting athwartship movement to 10mm shall be fixed such that they cannot be removed with the mast in place. (Note: Any other filling pieces or chocks do not have to be fixed).

- 6.104 Another mark (made from metal or plastic plate) 76mm measured fore and aft shall be placed as close as possible to the yacht's centreline, with its forward edge 1860mm forward of the after end of the mast marks. see diagram on page 22).

The forward edge of the forestay or its extension shall lie within the limits of this forward mark when racing.

See also rule 6.113.

- 6.105 A permanently bent or rotating mast is prohibited. However a permanent set in the aft side of the mast not exceeding 100mm between upper and lower measurement bands is not considered to contravene this rule.

- 6.106 A bracket or chock may be fitted at the mast head to keep the backstay (preventer) clear of the sail. This bracket shall not extend more than 102mm from the aft edge of the mast.

- 6.107 Measurement bands each not less than 15mm wide and clearly discernible while racing shall be marked on the mast as follows:

- (a) with its upper edge  $800\text{mm} \pm 10\text{mm}$  above the deck. This measurement shall be taken along the aft side of the mast in its most upright position.
- (b) and with its lower edge 9200mm maximum above the upper edge of the lower band.

A stop shall be fitted to prevent the top of the boom being below the top of the lower measurement band.

- 6.108 Jumper struts made of any permitted material shall be fitted with their upper edges  $6300\text{mm} \pm 15\text{mm}$  above the lower measurement band and shall not be less than 300mm long measured in a straight line from the side of the mast to the bearing point. They shall be connected at points within 30mm of their bearing points by a cross member of diameter not less than 4mm. A straight line between the bearing points of the jumper struts shall not be less than 30mm from the foreside of the mast.

- 6.109 Spreaders made of any permitted material shall be fitted with their upper edges not less than 3200mm and not more than 3615mm above the lower measurement band in a straight line from the side of the mast. They shall not be less than 450mm long measured from the side of the mast to the bearing point. The method of securing spreaders is optional but the fore and aft movement shall not exceed 10 degrees in either direction.

- 6.110 The spinnaker halyard shall be attached not more than 6300mm above the lower measurement band and not more than 40 mm from the face of the mast. For the purpose of this Rule, if the halyard is led through a fairlead, or bull's eye, its bearing surfaces shall be taken as the points of attachment.
- 6.111 The genoa/head sail halyard shall not be attached higher than the forestay.
- 6.112 The weight of the mast including all fixed fittings, jumper struts and diamond shrouds, but excluding all other standing rigging, running rigging, slides on any track fixed to the mast, and lower spreaders shall not be less than 30kg. The centre of gravity of the mast stripped for weighing shall be not less than 3400mm above the lower measurement band. Any corrector weights shall be permanently fixed [Note: This Rule shall apply to all masts regardless of the date of construction]
- The mast complete with all fixed fittings, jumper struts, diamond shrouds, spreaders, standing and running rigging, shall weigh not less than 39kg. In addition when it is supported at the lower measurement band and weighed at the upper band it shall not weigh less than 13kg. For the purpose of this latter measurement the halyards shall be in the sailing position and the standing rigging secured along the mast. The ends of the rigging below the lower coloured band may rest on the ground or be removed so as not to affect the tip weight. In case of doubt the first paragraph of this rule shall prevail.
- 6.113 The heel of the mast shall not be above a point 1450mm below the upper edge of the lower measurement band. The slot in the heel of the mast shall not be more than 25mm deep
- [Note: All yachts built and measured prior to 1st March 1991 with a mast step at time of first measurement giving a mast foot higher than 1450mm may retain that mast step but in that instance the fore and aft movement of the mast at deck under rule 6.103 shall be limited to 40mm and the measurement marks shall measure 40mm x 20mm and not 50mm x 20mm accordingly].
- 6.20 Aluminium Mast
- 6.21 The mast shall be constructed out of one continuous drawn extrusion with a section weight of not less than 2.2kg/m.
- 6.22 The mast shall be constructed with a continuous fixed groove for the mainsail luff rope.
- 6.23 The untapered section of the mast shall comply with the following minimum dimensions:
- (a) If the luff groove is extruded with the section:
- |              |                   |
|--------------|-------------------|
| athwartships | 70mm              |
| fore and aft | 110mm overall, or |
- (b) If the mast is constructed from a circular tube its diameter shall not be less than 75mm. The depth of the luff groove is optional.
- 6.24 The fore and aft dimension of the mast may be reduced by the depth of the luff groove, or the luff groove opened, below a point 400mm above the lower measurement band.
- 6.25 The mast may be tapered above a point 6700mm above the lower measurement band. The taper shall be convex or straight. However, local hollows not exceeding 3mm in depth will not be considered as contravening this rule.
- 6.26 The dimension of the mast at the upper measurement band shall not be less than 45mm athwartships, and not less than 50mm fore and aft including the luff groove for extruded sections and 45mm for masts constructed from circular tubes excluding the luff groove (as in 6.22).
- 6.27 The mast may be squared at the deck by the addition of any material.
- 6.28 The method of attachment of standing rigging is optional.
- 6.29 Running rigging may be led internally along the length of the mast. The exit points for the lower ends of adjustable jumper stays, if fitted shall be maximum 3715mm above upper edge of lower black band.
- 6.30 Spare No. (Rules for wooden masts are available as an appendix from the ISAF.)
- 6.40 Boom - General
- 6.41 The boom shall be of either one kind of wood or of aluminium alloy. For wooden boom see rule 6.60.

- 6.42 The boom shall incorporate a groove for the mainsail foot rope. The boom may be cut away to a maximum depth of 50mm or the groove opened out for not more than 250mm forward of the boom measurement band for the insertion of a track, or other device, to control the clew of the mainsail; and for not more than 250mm measured from the aft side of the mast, to permit the insertion of the mainsail foot rope. The ISAF approved a dispensation for booms manufactured by Holt Allen prior to 1995, which have a cut-away track which exceeds 250mm from the aft side of the mast.
- 6.43 A measurement band not less than 15mm wide and clearly discernible while racing shall be marked on the boom with its forward edge not more than 3450mm from the line of the aft edge of the mast, projected if necessary and disregarding any local projections or cut outs. A stop shall be fitted to prevent any part of the mainsail being moved aft of the forward edge of the measurement band.
- 6.44 A permanently bent boom is prohibited. However, a permanent set not exceeding 50mm between the forward end and the measurement band is not considered to contravene this rule.
- 6.50 Aluminium Boom
- 6.51 The sectional weight of an aluminium boom shall not be less than 1.5kg/m.
- 6.52 The boom section shall be not less than 80mm nor more than 100mm deep including the groove for the mainsail foot rope (which shall be continuous). Its width shall not be less than 64mm.
- 6.53 The boom shall not be tapered or cut away except as permitted in rule 6.42.
- 6.60 Spare number. (Rule for wooden booms are available as a separate appendix from the ISAF).
- 6.70 Spinnaker Boom
- 6.71 The spinnaker boom shall be of wood or of aluminium alloy.
- 6.72 The spinnaker boom length shall not exceed 2240mm.**
- 6.73 The fore and aft projection of the spinnaker boom fitting shall not exceed 75mm and shall not project athwartships at the mast.**

## 7. RIGGING

- 7.10 Standing rigging shall be of wire rope of not less than the following diameters:

main shrouds	5mm
lower shrouds	5mm
forestay	one of 5mm or two of 4mm
jumper stays	4mm
permanent backstay (preventer)	3mm (minimum length 9500mm)
running backstays	3mm (minimum length 6500mm)

The dimensions of other rigging are optional.

The material of the permanent and running backstays after the wire lengths specified above is optional. The material of the running rigging is optional

- 7.20 Shrouds or their extensions shall intersect or pass through the deck with their inner side not less than 700mm from the yacht's centreline and shall be attached to steel chain plates inside the hull. The fore and aft position of the shrouds at the deck and their position relative to each other is optional.
- 7.30 Shrouds shall be adjusted vertically with turnbuckles or other means of thread and shall be fixed horizontally at point where they pass through the deck. Any device which permits remote adjustment is prohibited.
- 7.40 Adjustment of the forestay is prohibited whilst racing.
- 7.50 Wire or rod ties are permitted between chainplates, or the deck where the shrouds pass through the deck, and/or the heel of the mast or the mast step.
- Such wires or rod ties shall not be adjusted while racing.
- 7.60 The standing rigging shall intersect with the wall of the mast (port side rigging to port side mast, starboard to

starboard) between the following dimensions measured above the upper edge of the lower measurement band.

	Maximum	Minimum
Upper jumper wire	9000mm	8950mm
Lower end jumper wire	3715mm	optional
Forestay	6200mm	6000mm
Main shrouds	6200mm	6000mm
Running backstays	6200mm	6000mm
Lower shrouds	3500mm	3150mm

Lower shrouds shall always intersect the mast below the spreaders (see rule 6.109). Lower ends of jumper wires shall always intersect the mast above the spreaders.

For the shrouds, jumpers and backstays the point of intersection is where the inner side of the wire intersects the mast. For the forestay the point of intersection is where the forward or upper side of the wire intersects the mast.

## 8. FITTINGS

- 8.10 Fittings are optional except where specifically restricted or prohibited by these rules. Supports for fittings shall be of wood, GRP or metal, or a combination of these.
- 8.20 A furling device for headsails is permitted but it shall not be in a recess in the deck unless that recess is covered with a plate. See Rule 2.5.11.
- 8.30 Winches, tackles, levers and other devices not specifically prohibited are permitted for any purpose on board, except for the adjustment of shrouds and forestay.
- 8.40 The method of sheeting the mainsail and headsails is optional except that fittings for sheets shall be placed so that they do not protrude outboard of the sheerline.
- 8.50 Hydraulic equipment is prohibited.

## 9. SAILS

- 9.10 General
- 9.11 Sails shall be made and measured in accordance with the ISAF Equipment Rules of Sailing, (ERS) 2005 - 2008, except where varied herein.
- 9.12 The body of the sails shall be of single ply construction. Mainsail and headsails shall be made of woven polyester cloth. Spinnakers may be made of woven polyamide cloth or woven polyester cloth. The sizes of the reinforcements are optional. The weight of the cloth used in the construction of each sail shall be within the limits specified below, or the list of equivalent thicknesses in the Equipment Rules of Sailing
- |   |  |
|---|--|
| Mainsail, Headsail<br>(formerly headsail number 1): | 270g/m <sup>2</sup> minimum<br>304g/m <sup>2</sup> maximum |
| Genoa:  | 150g/m <sup>2</sup> minimum<br>304g/m <sup>2</sup> maximum |
| Spinnaker:  | 38g/m <sup>2</sup> minimum                                 |

Note: A sail may be made of different cloth weights within the above limits. The weight in g/m<sup>2</sup> of the body of the sail shall be indelibly marked by the sailmaker together with his signature, stamp, or sailmaker label, and the date near the tack (in spinnakers near the head).

- 9.13 Non-woven transparent panels are permitted in each sail excluding spinnakers. The total area of the panels in each sail shall not exceed 1.2m<sup>2</sup>. No part of such a window shall be closer to the luff, leech or foot than 150mm.
- 9.14 The Class Insignia is Letter D. Letters and numbers shall be placed on the sails in accordance with RRS 77, except that National letters and numbers shall be placed on the mainsail, but no letters or numbers have to be placed on the genoa.
- Double-luffed sails (except as permitted in rules 9.34 and 9.43) and loose-footed mainsails are prohibited.
- 9.16 Each sail measured after 1st January 1991 shall have permanently fixed, near to its tack, an official IDA label. No sail shall be accepted for its first measurement without a sail label. The measurer shall sign across the label and sail to ensure that it cannot be transferred to another sail. Labels shall only be available from the IDA Secretary (or Treasurer) and the cost shall be fixed by the IDA in general meeting
- 9.17 Each sail measured after 1st January 1991 shall have permanently fixed, near to its tack, an official IDA label. No

sail shall be accepted for its first measurement without a sail label. The measurer shall sign across the label and sail to ensure that it cannot be transferred to another sail. Labels shall only be available from the IDA Secretary (or Treasurer) and the cost shall be fixed by the IDA in general meeting

9.20 Mainsail

9.21 The mainsail shall comply with the measurements on the measurement diagram and rule 9.12.

9.22 Cross widths shall be measured between a point on the leech and to the nearest point on the luff (including the bolt rope), found as follows:

The upper – point of the leech is located at 410 mm from the head-point (see diagram).

The three-quarter point of the leech is located at 2370 mm from the head (see diagram)

The mid-point of the leech is located at 4750 mm from the head (see diagram)

Hollows in the leech in the way of measured points shall be bridged.

Sails first measured before 01 March 2002 may be measured under the 2001 Class Rules.

9.23 There shall be four batten pockets on the leech of the sail, each within 127mm of the respective point which divides the leech into five equal parts. Strengthening patches on the inner end of each batten pocket may be self-adhesive.

9.24 The lengths of the batten pockets shall not exceed:

Top	650mm
Middle two	950mm
Bottom	650mm

9.25 No part of the sail shall extend beyond the inner edge of the boom measurement band or the lower edge the upper mast measurement band. The line of the top of the boom shall not be below the upper edge of the lower mast measurement band. The luff and the foot of the sail shall have bolt ropes which shall be within the full length of the relevant spar grooves while racing.

9.30 Genoa

9.31 The genoa shall comply with the measurements on the measurement diagram and rule 9.12.

9.32 The distance from the head to the mid-point of the foot shall not exceed the average of the length of the luff and leech by more than 30mm. The mid-point of the foot is equidistant from the tack point and the clew.

9.33 The foot of the genoa shall be nowhere concave.

9.34 The genoa may enclose the forestay but not more than one zip shall be used and provided the sail can be attached and removed without disconnecting the forestay. A sail enclosing the forestay shall be measured with the zip closed and the width of the luff pocket so formed shall not exceed 60mm. Chafing patches may be self-adhesive.

9.40 Headsail

9.41 The headsail shall comply with the measurements on the measurement diagram and rule 9.12.

9.42 Two batten pockets are permitted on the leech of the headsail, each not exceeding 350mm in length, dividing the leech into equal parts with a tolerance of 100mm.

9.43 The headsail may enclose the forestay provided the sail can be attached and removed without disconnecting the forestay. A sail enclosing the forestay shall be measured with the zip closed and the width of the luff pocket so formed shall not exceed 60mm. Chafing patches may be self-adhesive.

9.50 Spinnaker

9.51 The spinnaker shall be a three cornered sail symmetrical about its centreline and shall comply with the measurements on the measurement diagram and rule 9.12. The spinnaker shall not embody any device capable of altering its shape except that a retrieving line attached to the vertical centerline of the sail is permitted and is to be used for the sole purpose of withdrawing the sail while it is being lowered.

9.52 The luffs and the foot shall be taped with stretch resistant tape.

9.53 The dimension of the attachment of the swivel or, the cringle at the head of the spinnaker and which is within the sail, shall not exceed 38mm. The horizontal dimensions of any device or fitting at the head of the spinnaker shall not exceed 38mm.

9.54 Measurements on the centrefold shall be taken with tensions applied at the head and centre of the foot sufficient just to remove the wrinkles across the line of measurement.

9.55 Not more than two spinnakers shall be on board while racing.

## 10. WEIGHT OF YACHT

10.10 The weight of the hull, shall not be less than 1650kg weighed complete with floor boards, seats, pumps and all fittings normally used on board whilst racing but excluding the following: Mast and boom with their fittings, spinnaker boom, standing rigging, halyards and sheets, and loose equipment. The equipment included in the weight of not less than 1650kg shall not thereafter be removed whilst racing.

10.11 The weight of the yacht that is the hull complete as stated in Rule 10.10 (including bilge pump(s) but excluding other equipment listed in rule 11) and together with the mast, boom, spinnaker boom and their fittings, standing and running rigging and one set of sheets for each of the headsail, mainsail and spinnaker shall be not less than 1700kg.

10.12 The weight of the yacht as shown on the measurement form shall clearly show whether the helmsman's and/or crew seats have been included (for boats measured after 1st March 1996).

### Swing Test

10.20 Yachts first measured after 1st March 1989 or re-measured after this date according to rules 1.12 or 1.64 shall be subject to the swing test in accordance with rule 10.21, except where such re-measurement takes place as a result of reinforcement being added under 2.515.2.

10.21 When the hull as defined in rule 10.10 is swung from the class approved swing test gear then:

(a) the centre of the bearing point of the swing test gear ("the swing centre") shall not be less than 40mm nor more than 90mm forward of station 8 of the hull.

(b) when 10kg are placed 4700mm forward of the swing centre the distance by which a point on or level with the deck 4800mm forward of the swing centre shall drop below its original position shall be measured ("D1").

(c) the depth of the swing centre below the sheerline ("D2") shall not be more than 550mm for a "D1" measurement of 350mm or where D1 is greater or less than 350mm D2 shall be such a distance as is proportionate thereto calculated by the following formula:

$$D2 < 938.29 - \frac{135899}{D1}$$

Provided that if the weight of hull specified in rule 10.10 is more than 1650kg D2 may be increased by 1mm for every 4kg that the weight of the hull exceeds 1650kg.

(d) when the 10kg weight in sub-paragraph (b) is removed the hull shall be allowed to oscillate for 10 cycles and then time taken shall be not less than 46 secs for a "D1" measurement of 350mm plus or minus 1 second for every 20mm by which the "D1" is either greater or less than 350mm.

(e) the arrangement of lifting eyes, frames, internal moulding and/or fittings shall be such that they shall not obstruct the use of the class approved Swing Test gear. (See drawing page 31). Any fittings or equipment in this area, eg pump, shall be easily removable.

10.30 If the hull is found to be underweight and/or the depth of swing centre ("D2") is lower than permitted and/or the oscillation time is less than the minimum, lead corrector weights shall be fixed to the hull so as to bring the weight of the hull and/or D2 and/or the oscillation time up to the relevant permitted minimum. In accordance with ISAF Measurement Instructions, 'fixed' means that a tool is required to remove this item from its position.

10.31 The positioning of corrector weights is optional provided 10.30 is complied with and that no more than 20kg can be positioned in the hull between stations 4 and 12.

10.32 The correctors shall be adjusted in accordance with rule 1.65 and 1.66.

10.40 The weight and position of all corrector weights shall be entered on the yacht's measurement certificate. Corrector weights shall be clearly visible and the weight of each shall be permanently marked thereon (for boats measured after 1st March 1996).

## 11. EQUIPMENT

11.10 The following equipment shall be on board while racing:

1. An anchor of not less than 10kg, or an anchor of not less than 5kg with chain so that the combined

- weight at anchor and chain is not less than 10kg. The anchor shall be of a recognised pattern.
2. One length of anchor rope of not less than 30m, weighing not less than 3kg in dry condition.
  3. One manual bilge pump. An electric bilge pump may be fitted in addition. Pump batteries shall not be included when the boat is weighed under Rule 10.10
  4. A Personal Flotation Device (PFD) with minimum buoyancy of 50 Newtons shall be carried for each person on board. Each PFD shall be either of the compressed gas automatically inflatable type, or of the permanently buoyant type or a combination of both.
  5. Two oars or paddles (or one of each). The paddles shall be a minimum of 1.2m long and suitable for the intended use of propelling a Dragon.
  6. **Two buckets each holding not less than 9 litres and with a lanyard of not less than 1 metre.**
  7. One Compass
  8. **The anchor, anchor rope, buckets, towing rope and all other emergency equipment, which may be required by other rules, shall be stowed in positions where they are accessible without having to open any watertight or sealed compartment.**

## 12. PROHIBITIONS

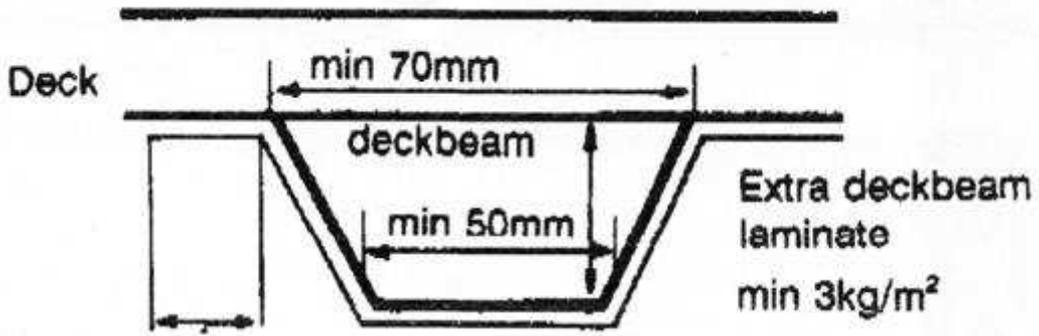
- 12.10 Altering the effective length of the forestay whilst racing is prohibited.
- 12.20 Any devices transmitting or correlating data relative to wind direction or speed or boat speed and location, by means such as, but not limited to, electronic, mechanical, hydraulic or pneumatic are prohibited. Depth sounders may be permitted by an Organizing Authority for races within its jurisdiction.
- 12.30 Except for corrector weights in accordance with rule 10 inside ballast is prohibited.
- 12.40 Self-bailers or means other than pumps for draining the cockpit while racing.

## 13. CREW

- 13.10 There shall not be more than four persons on board while racing. A boat shall compete with the same number of crew throughout an event
- 13.20 The use of any apparatus or contrivance (other than fixed hand holds on the inside face of the cockpit coaming) the purpose of which is to support or assist in supporting a member of the crew outboard or partially outboard is prohibited. When hiking no part of the crew's body between the middle of the thigh and feet shall be outboard of the sheerline.
- 13.30 Except when excluded by the Sailing Instructions, the total weight of the crew shall not exceed 285 kg. The weight shall be taken with the crew wearing lightweight clothing. If a crew has been officially weighed in immediately previous to the regatta, re-weighing during the regatta shall not take place unless there is a change of crew.

Rule 2.509

Section through centre 70% of deck beam



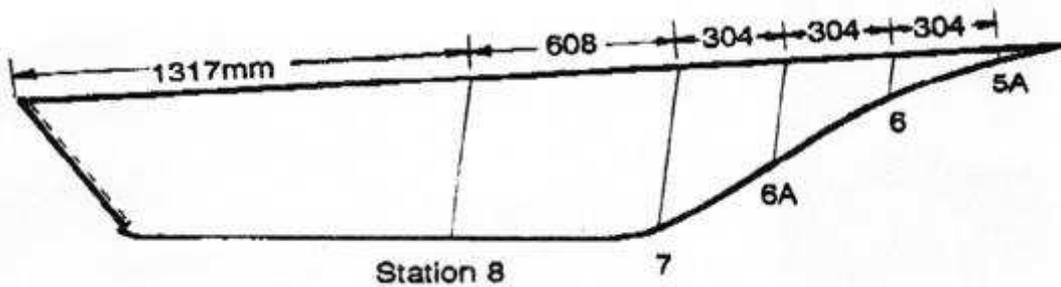
Rule 3.13

Cabin Top



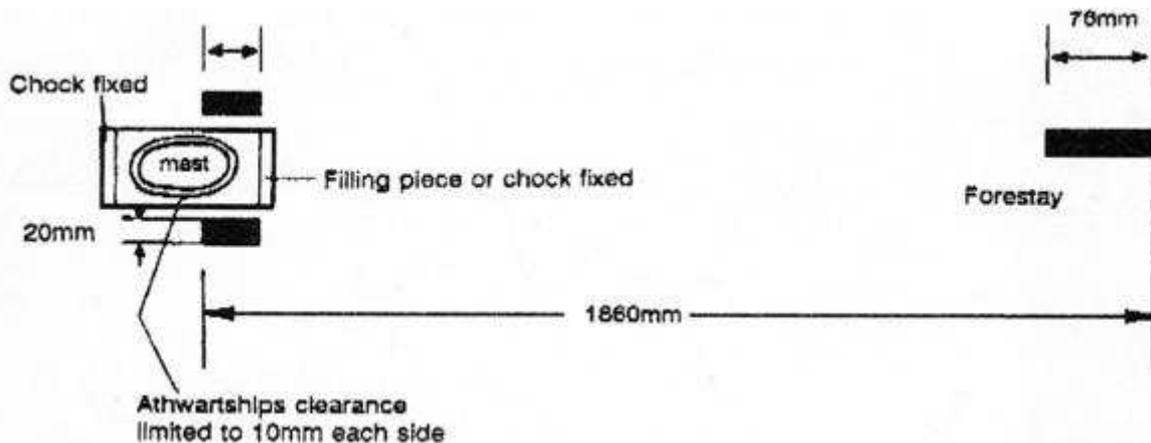
Rule 4.60

Keel Measurement



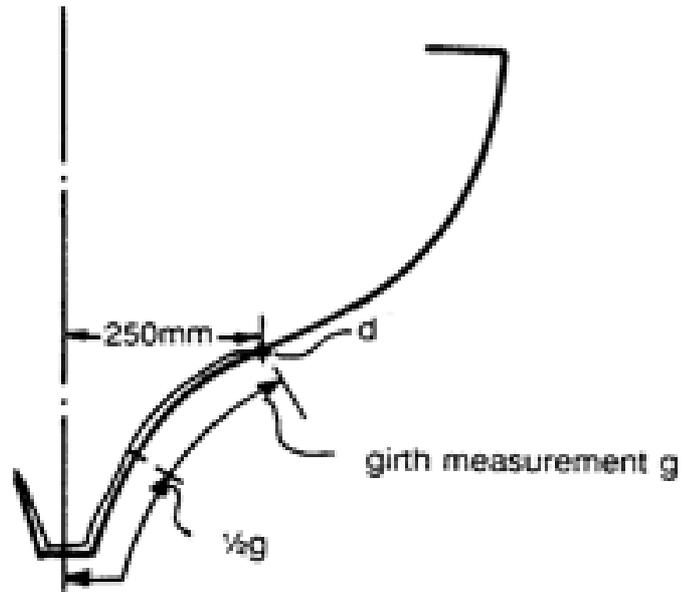
Rule 6.103 and 6.104

Mast and Forestay Marks



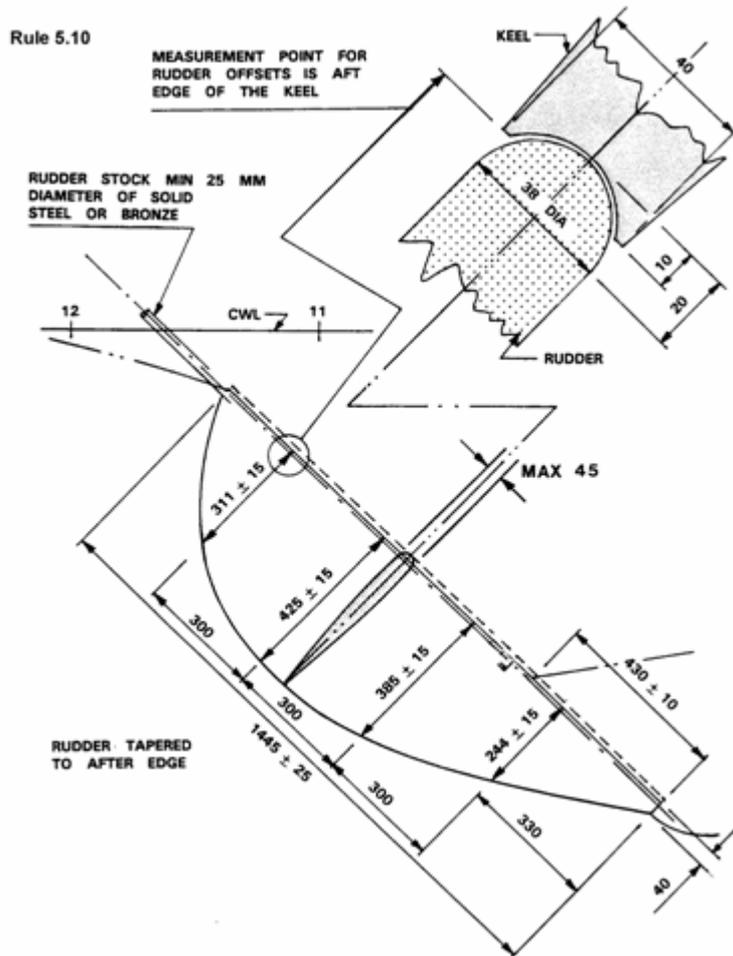
**Rule 2.50**

**Keel Reinforcement**



**Rule 5.10**

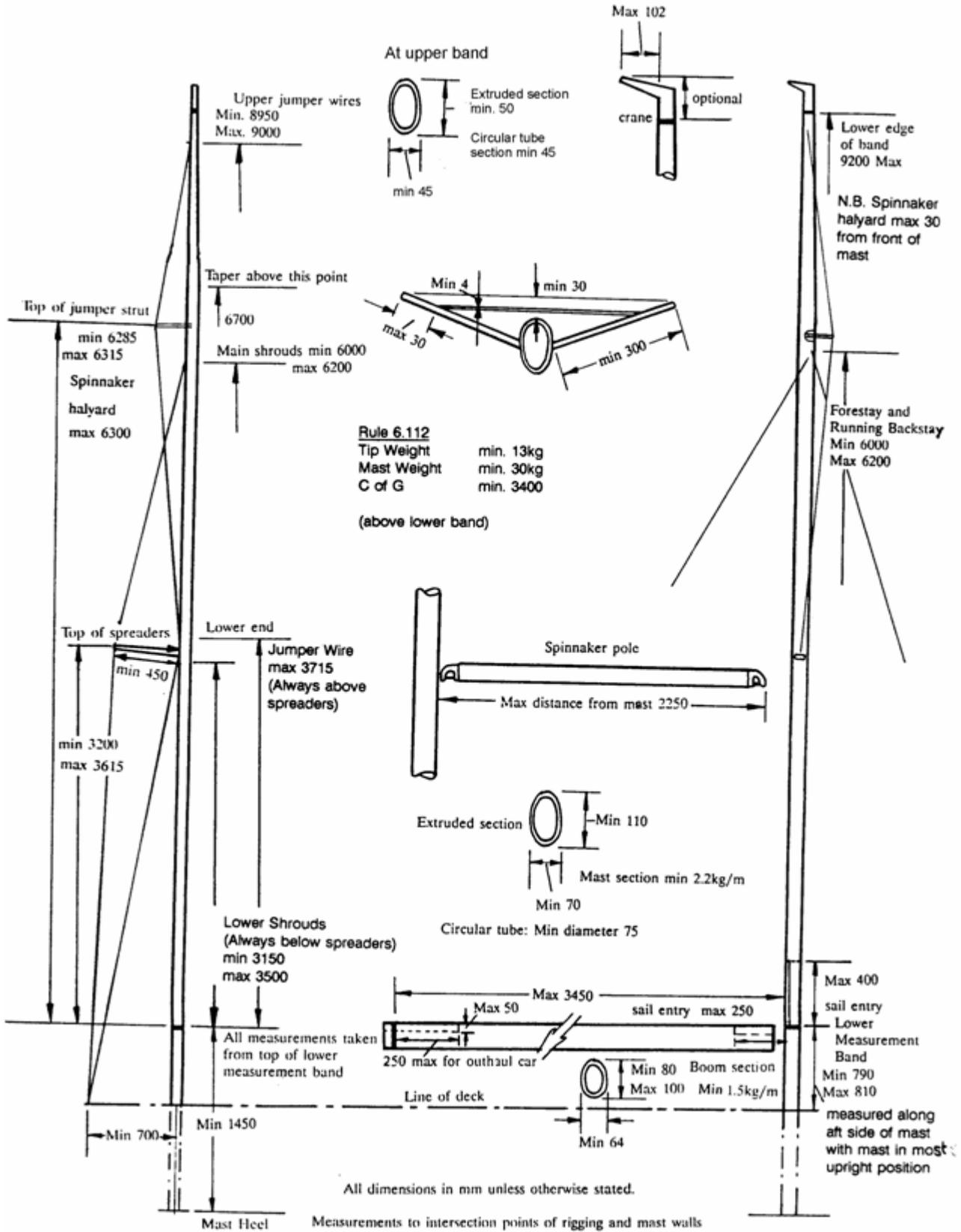
**Rudder**



**Rule 6**

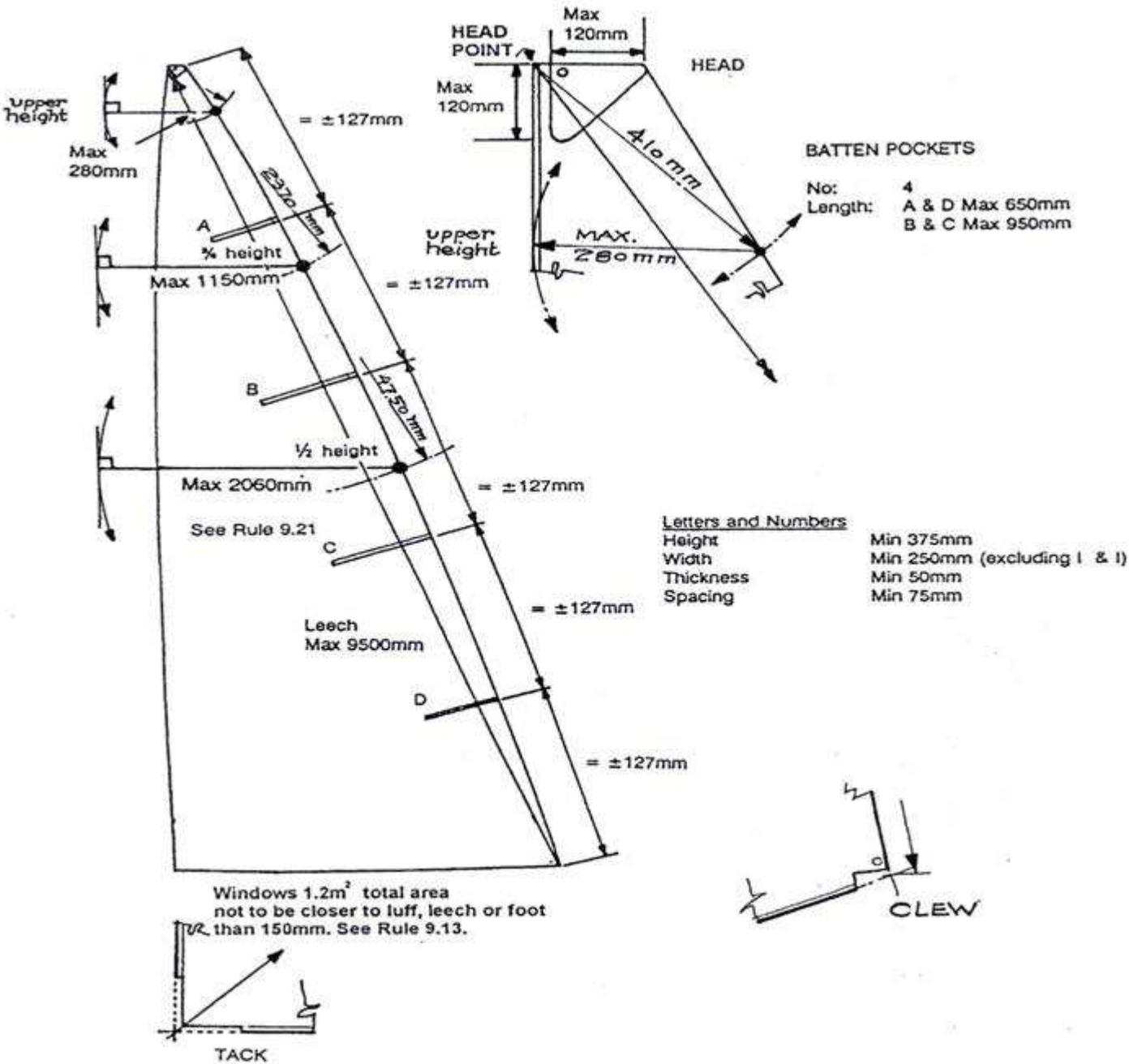
**Diagram of Spars**

**DIAGRAM OF SPARS**



**Rule 9.20**

**Mainsail**

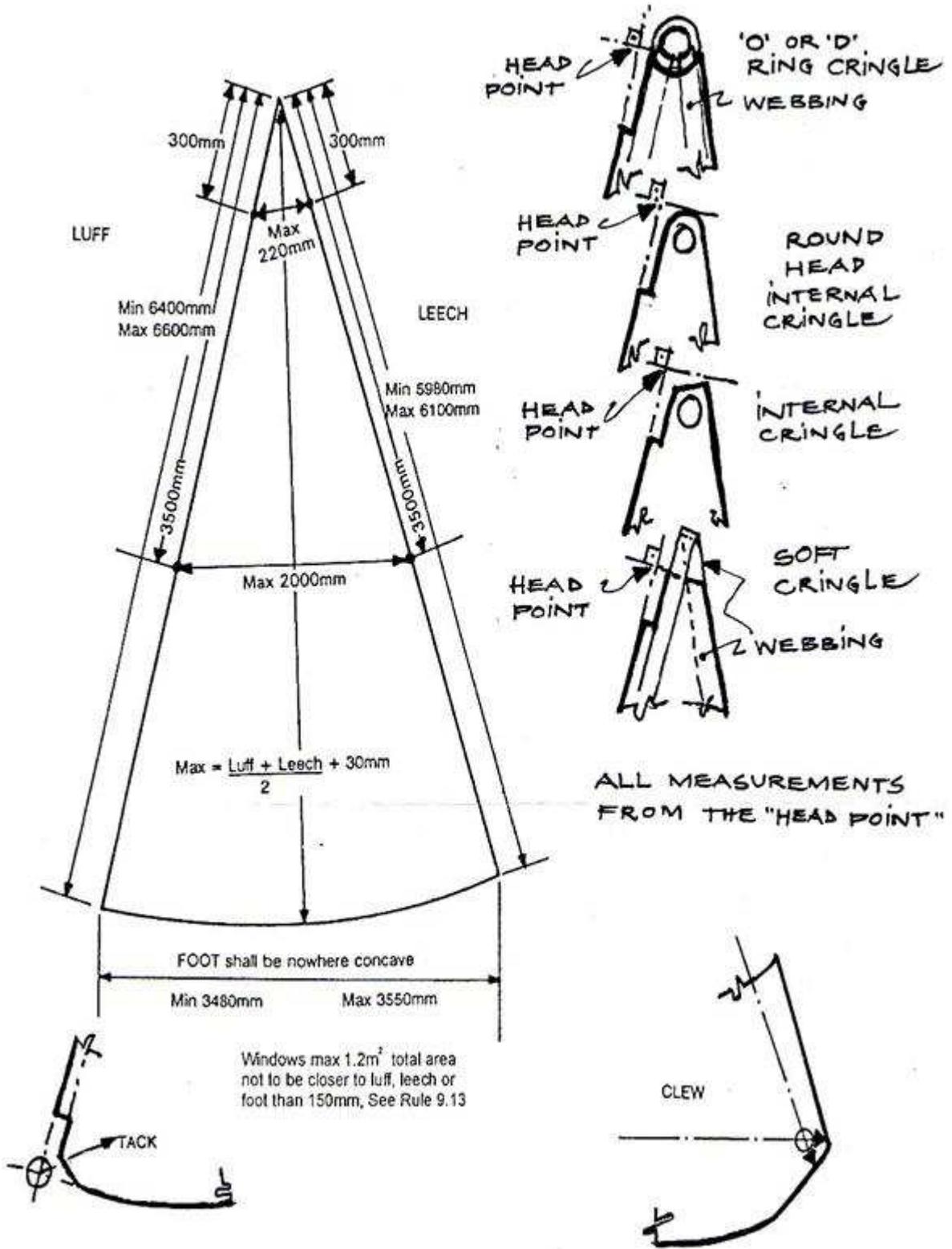


SAILMAKER'S MARK Max 150 x 150mm and within 520mm of the TACK

**For sails first measured before 01 March 2002 where the half and three quarter heights are found by folding; see diagram in 2001 Class Rules.**

**Rule 9.30**

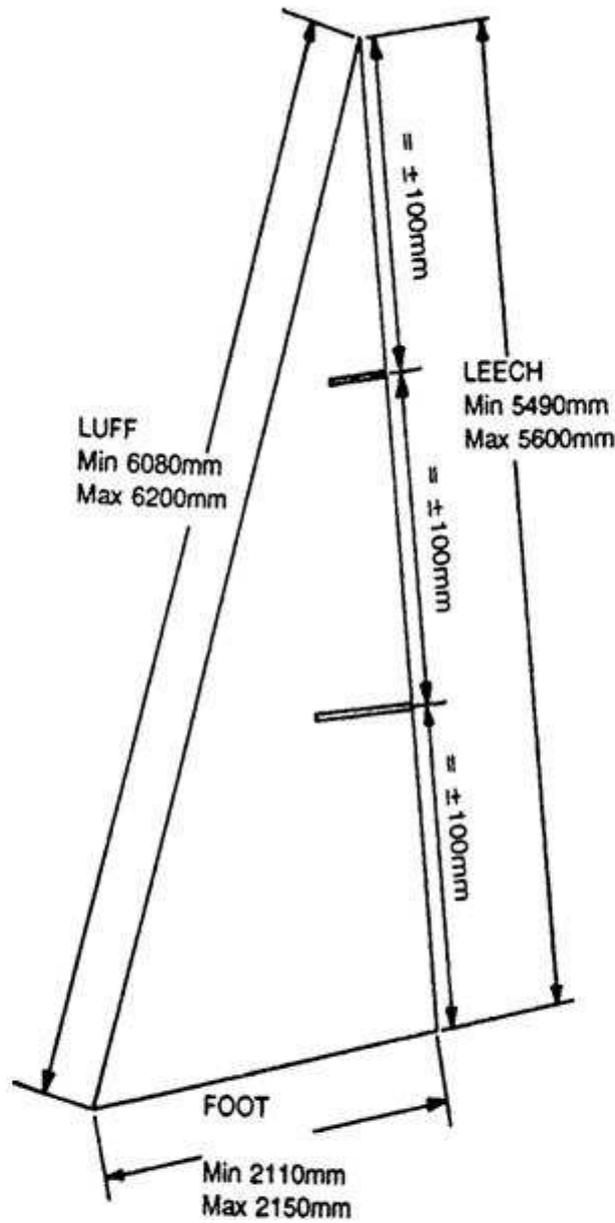
**Genoa**



**SAILMAKER'S MARK** Max 150 x 150mm & within 530mm of the TACK

**Rule 9.40**

**Headsail**



**BATTEN POCKETS**

No: Max 2

Length: Max 350mm

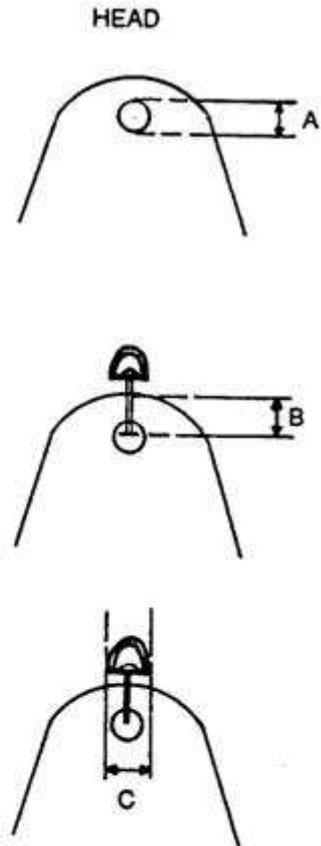
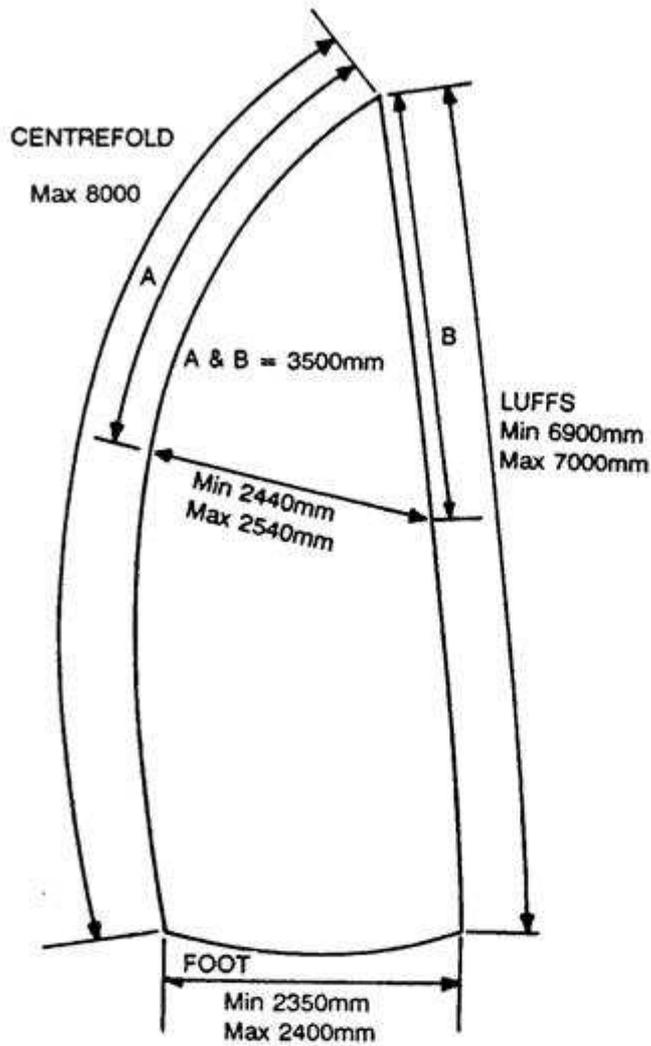
**WINDOWS** max 1.2m<sup>2</sup> total area, not to be closer to luff, leech or foot than 150mm. See Rule 9.13

**SAILMAKER'S MARK** Max 150 x 150mm & within 320mm of the TACK

**Rule 9.50**

**Spinnaker**

Please note that the minimum dimension of 2350mm for the foot should be altered to 2300mm



**RULE 9.53**

- A & B** Max 38mm. Cringle or swivel attachment within the sail.
- C** Max 38mm. Horizontal dimension of any fitting or device.

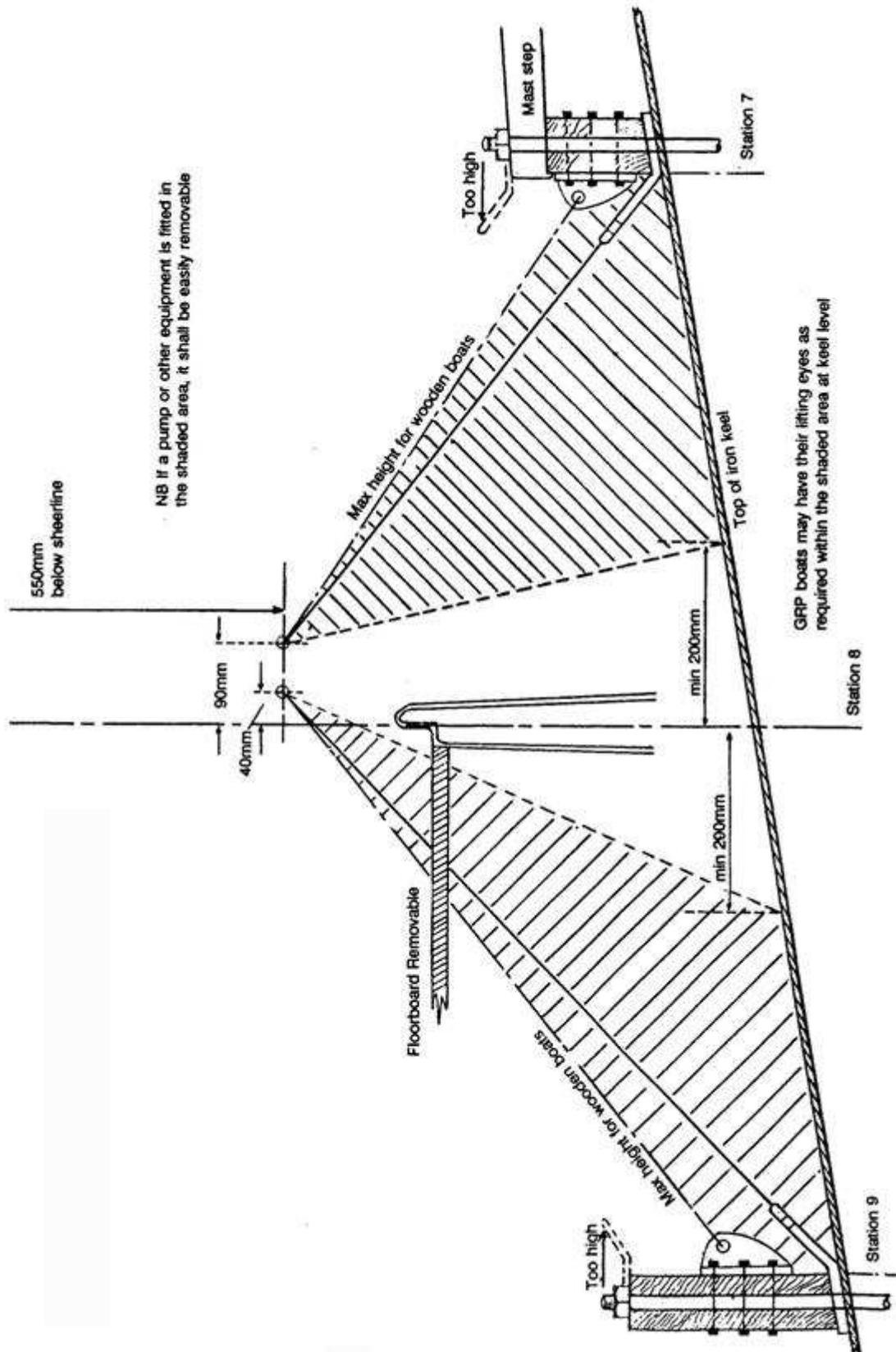
**SAILMAKER'S MARK** Max 150 x 150mm

**LETTERS AND NUMBERS**

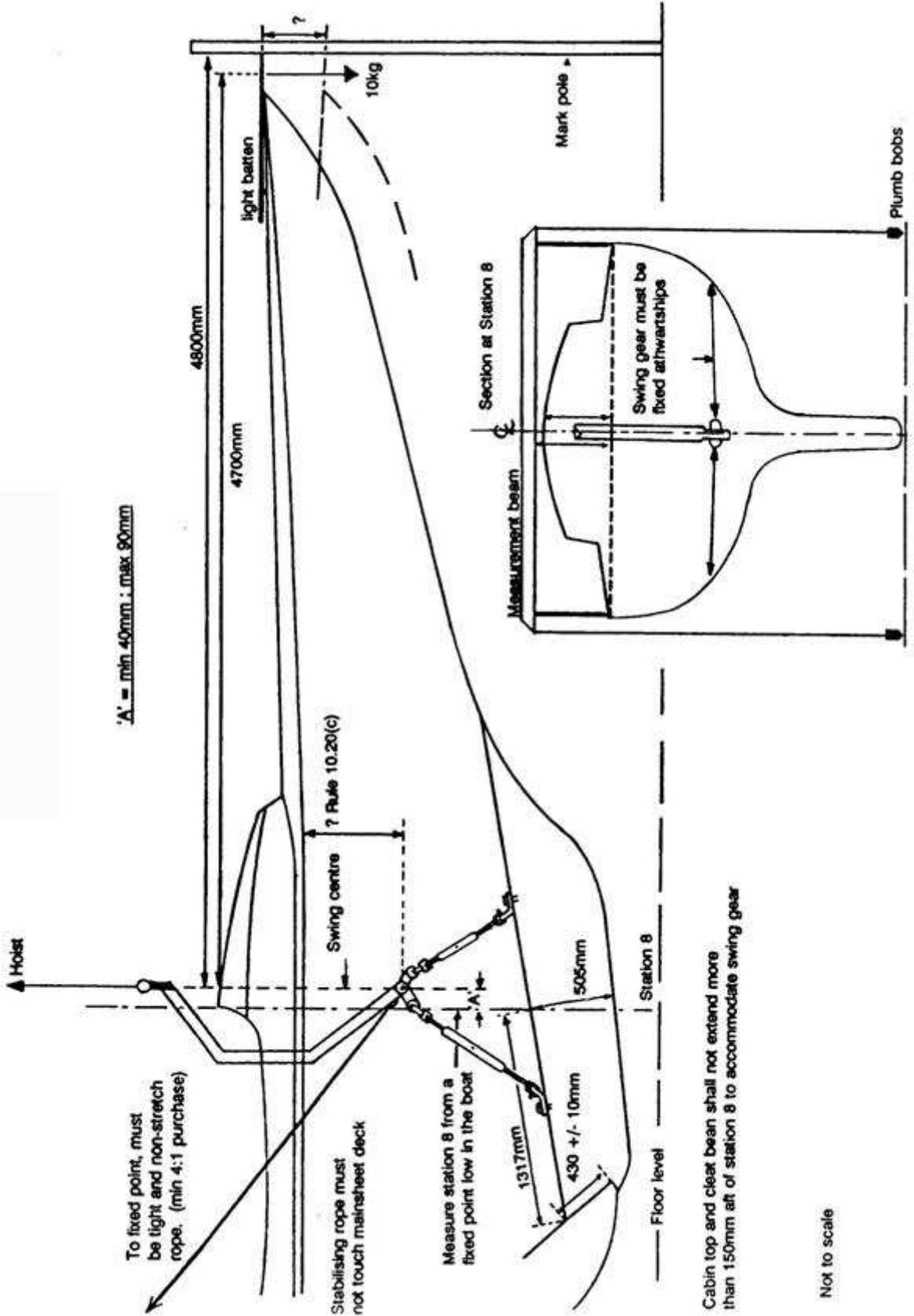
Height	Min 375mm
Width	Min 250mm (excluding I and 1)
Thickness	Min 50mm
Spacing	Min 75mm

**Rule 2.17 and 10.21 (e)**

**Arrangement of Lifting Eyes and Swing Test Gear**



Swing Test Gear in Position



## ADDITIONAL RULES:

### HULL TEMPLATE PROCEDURE

1. Since 1 February 1952, the hull shape of all Dragons constructed has been checked by hull section templates. It was then decided that the shape of the hull stations may vary from the dimensions given on the table of offsets and the lines body plan by not more than  $\pm 0.5\%$  of the half station circumference at the following stations:

Station	Tolerance	Max Distance outside hull to template
2	$\pm 5\text{mm}$	10mm
4	$\pm 6\text{mm}$	12mm
6	$\pm 7\text{mm}$	14mm
8	$\pm 8\text{mm}$	16mm
10	$\pm 7\text{mm}$	14mm
12	$\pm 5\text{mm}$	10mm
14	$\pm 5\text{mm}$	10mm

2. The shape at Stations 2,4,6,8,10,12 and 14 shall be checked with ISAF registered and IDA approved templates.
3. It is the responsibility of the License holder to mark the stations in accordance with Rule 2.15.
4. The Measurer shall check the positions of these marks and the compliance of templates with plan 8 previous to applying the hull section templates. The measurer shall report any departure from plan 8 immediately to the IDA.
5. When applying the hull section templates, they shall be set at the correct width over the deck at the covering board plus the permitted deviation at each measurement station.  
At Stations 6 and 8 the templates shall be attached to the keel templates in the form shown in Plan 3. At Station 10 the template shall be attached to the support round the rudder as shown in Plan 3. When applying the hull section templates, the levelling bars/holes shall be sighted in line (in transit).
6. Position the template with its centre-line coincident with the centreline of the boat initially, and with one face of the template coincident with the station markers.
7. Equalise the clearance between template and hull until the station to be measured fits comfortably within the permitted limits. When moving the template sideways, care has to be taken to keep the levelling bars aligned.
8. Measure the clearances all around the template.
9. Measure height of sheerline on each side.
10. Record the greatest and smallest dimension measured in the measurement form.

### STEM TEMPLATE PROCEDURE

#### Assembly

The angle bracket supplied with the template must be permanently fixed to the station 2 template ensuring that the stem template is on the centreline and that its base is at the correct height as shown in Plan 3.

#### **Use**

1. All templates must be correctly positioned and the stem template fixed to the angle bracket on station 2.
2. With the stem template in its forward most adjustment, move it aft until it touches the stem at least one point.
3. Check and adjust (moving template forward if necessary) height of the template sighting the level bar with those on the station's templates.
4. When the template is level with the station's templates and touching the stem at at least one point, check the clearance is within the 0-10mm tolerance permitted, check that sheerline height is within the marks and that the datum line is inside the allowed minimum 4680mm and maximum 4729mm distance forward of station 8.
5. Lightly pencil the 100mm and 750mm scribe marks on the hull from the template. On removing the stem template check that the rounding of the stem does not exceed a diameter of 9mm between these points.

## **SWING TEST PROCEDURES**

This test must be conducted indoors in a draught-free environment. An electric hoist will make the test easier.

### Checking measurement marks at Station 8

1. Check or place the station 8 mark on the upper edge of the iron keel. This is at 1317mm from the aft end of the keel. There is no tolerance on this measurement.  
  
The aft upper edge of the iron keel can be found at  $430 \pm 10$ mm by measuring along the aft face of the keel and at station 8 the upper edge can be found at approximately 505mm above the bottom edge. (The plans show this distance as 500mm). See diagrams on pages 29 and 30.
2. Check or mark stations 2 and 14 on the boat centreline. These are straight-line measurements at 3672mm and 3695mm respectively, from station 8. Using stations 2 and 14 level the boat about her waterline with a water level or a surveyors level. REMEMBER STATION 14 IS 110MM HIGHER THAN STATION 2.
3. Checking that sheerline station 8 marks are square to the centreline (equidistant from the stem on both sides) place a straight measurement beam in position at this station.
4. Using plumb bobs from both ends of the measurement beam, adjust until the lines are on the sheerline marks. With a straight edge under the keel, sight the lines onto the hull and check that the station 8 marks on the keel are within the tolerances. Rule 4.60.
5. Measure and record the height of the coach roof or some other exact point above the sheerline. This will be used later to determine the height of the swing centre.
6. Mark station 8 on the cabin top.
7. With a plumb bob from the measurement beam or aft side of the cabin top record a measurement from some fixed point (close to station 8) within the boat, to station
8. Remember to correct for the distance between plumb line and station 8 on the cabin top. This measurement will be used to determine the position of the swing centre fore and aft.
9. Tape a level to the deck, adjusting so that it is horizontal and parallel to the centreline. This will provide a constant reference that the boat is hanging horizontal.

### The Swing Test

Weigh the boat with the mandatory gear on board. Place eventual corrector weights temporarily on each side approximately 70mm forward of station 8 and at approximately 570mm below the sheerline.

1. Install the swing test gear. The swing centre should be approximately 70mm forward of station 8 and approximately 570mm below the sheerline, or as low as possible. Remember to tie the boat athwartships from the swing centre.
2. Lift the boat and using the previously attached level make sure the boat is hanging horizontal from the swing gear. Adjust as necessary, but ensure the swing centre is kept as low as possible.
3. Lower the boat until it just touches the ground and support it sideways. Using the fixed points taken in previous steps 5,6 and 7, measure and record the distance the swing centre is below the sheerline and the distance the swing centre is forward of station 8. Mark the position of the swing centre on the cabin top.
4. Check and tighten all the fastenings on the swing gear to ensure no possible movement.
5. Place a light batten on the foredeck with its forward end exactly 4800mm forward of the swing centre mark on the cabin top.
6. Lift the boat again and check that it is still level. With a vertical stick mark the position of the foredeck batten with the boat at rest.

7. Hang 10kg 100mm back along the foredeck batten to be exactly 4700mm forward of the swing centre. Measure and record how much the stem is depressed at the end of the foredeck batten. Remove the 10kgs.

BEFORE STARTING THE SWING TEST, THE SWING GEAR MUST BE STABILISED.

A purchase system (of at least 4:1) of non-stretch (spectra or kevlar) must be attached to the eye on the swing gear and a suitable point on the building at an angle of not more than 45 degrees to the horizontal. THIS LINE MUST BE TIGHT AND THE SWING GEAR SOLID AND WITHOUT MOVEMENT. THIS IS VERY IMPORTANT.

8. Depress the stem by about 350mm and release. After the stem has gyrated through 1½ complete cycles, take the time for 10 complete cycles, starting and stopping as the stem descends past horizontal. Take the times independently with 2 digital timers using hundredths of a second. Complete the swing procedure twice and average the results. Work these results through the requirements of rule 10.20.
9. If the measurement and times taken do not correspond to the rules, corrector weights must be moved or added so that the height and fore and aft position of the swing centre, as well as the period of gyration fall within the tolerances specified in the rules.