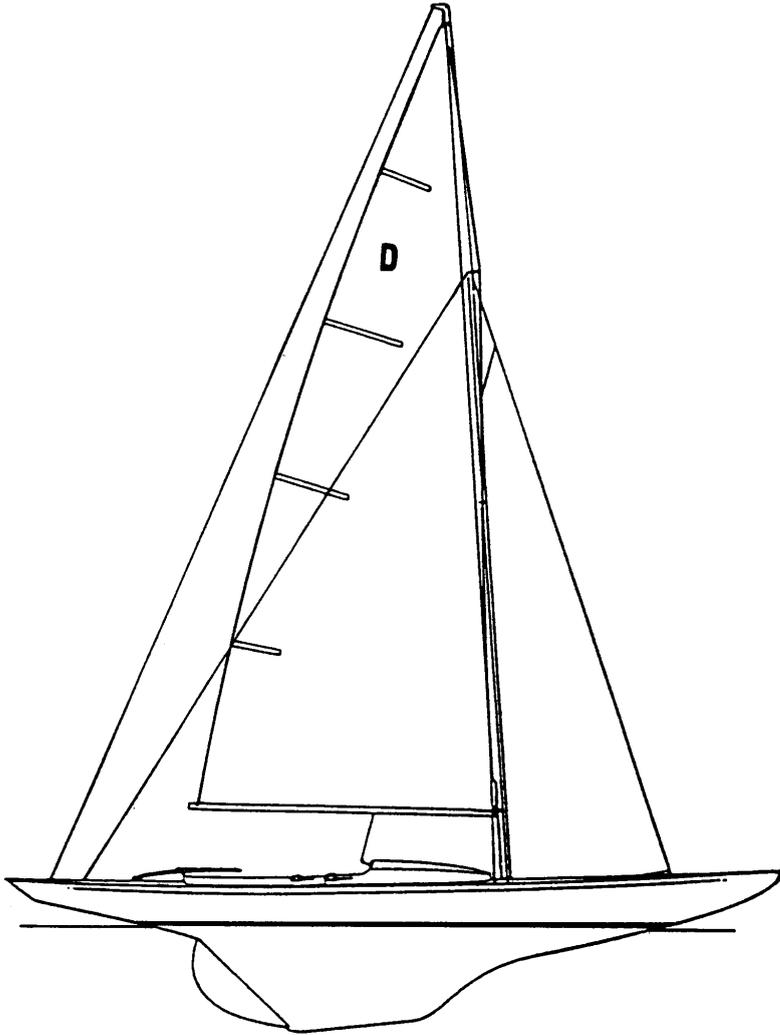




2002

INTERNATIONAL DRAGON CLASS RULES



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

Nominal principal Dimensions

LOA	8.9m
Beam	1.95m
Draft	1.2m
Displacement	1700kg(with mast)
Mainsail	16m²
Genoa	11.7m²
Spinnaker	23.6m²

LIST OF OFFICIAL PLANS

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

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

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 or is not clearly covered by the plans or specification, you must assume that it is illegal, and must obtain a ruling from the Class Technical Committee before attempting it. The only exception to this rule are 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 therefrom.

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 permitted in accordance with RRS Appendix 1. ISAF Advertising Code 20.3.2 (a) (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 end 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 to measure sails manufactured by that loft.

- 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 as stated in rule 1.52 are excluded from this rule for sail loft 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 8 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's original measurement certificate was issued.
- 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.

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.

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 A copy of the completed and signed measurement form shall be supplied to the IDA Secretary by the builder or the owner. If the boat is not yard finished this copy shall be supplied by the owner before the yacht is raced.
(New owners are requested to inform the IDA Secretary of their purchase to enable a record to be kept of the movement of boats).
- 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 0.0625m² 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 station 8 on both sides of the yacht, and on the centreline of the stem (at stations 2 and 4), and of 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.
- 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 yachts first built and measured after 1st March 1991 shall have positive buoyancy of minimum 1,400 litres by means of buoyancy tanks. All yachts built and measured after 1st March 2000 must have positive buoyancy of a minimum of 1,700 litres by means of buoyancy tanks or closed cell polyurethane foam with a minimum density of 32 kg/m³
- 2.192 Any bulkhead shall only be constructed at or within 300mm of stations 5 or 12 or at the forward and aft ends of any internal moulding. A means of pumping the tanks clear of water shall be fitted. Inspection hatches shall be fitted, the weight of which shall be no greater than that of the part of the bulkhead which they replace, and shall be closed when racing. The bulkheads may be of wood, plywood or any sandwich construction.
- 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 may be reinforced in the same manner as permitted for GRP yachts under 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/m³ and 575kg/m³ (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/m³. The weight of the hull skin including glue shall not be less than 12kg/m².
- 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^3 and covered with canvas of not less than 236g/m^2 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^2 .

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^2 excluding frames. Minimum weight of planking timber 360kg/m^3 (will allow Western Red Cedar). Laminated frames of timber of minimum weight 530kg/m^3 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 specification of permitted and prohibited materials will be available on request from the IDA.
- .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.

Note: A list of permitted materials is available from the Secretary of the IDA. No other materials may be used without the written consent of the IDA.

2.503 Hull Shell

The weight of the exterior hull moulding shall be not less than 12kg/m² 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, 250mm from the centreline (see diagram on 23).

The laminate shall be of uniform thickness below a point ½g 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 in accordance with the following table. 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 ²	Total Area of 450g Glass use m ²	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

An internal moulding of one or more components shall be bonded to the exterior hull moulding and it shall extend at least from station 5 to station 11.

The minimum horizontal width of the moulding shall be:

at station 8 1700mm
 at each end 1300mm

The top edge of the moulding shall not be below a continuous fair curve on each side of the yacht between the minimum points. No part of the moulding shall extend below 1000mm from a line joining the two sheerlines nor shall it, at any point, extend higher than 200mm below the deck.

The internal moulding may incorporate a web or frames, at its forward and aft ends.

Foam of not less than 80 kg/m³ may be used in addition to the required laminates.

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 may be formed as part of the internal hull moulding. No part of a floor shall extend below 1000mm from a line joining the sheerlines. The floors shall extend up to the underside of the cabin sole.

The floors shall be of a uniform laminate of 7.5kg/m². The floors shall be bonded to the hull with a laminate of not less than 6kg/m².

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).

2.509 Deck, Coamings and Cabin

The deck shall be of balsa or foam sandwich construction of minimum weight 9kg/m².

If the core is of balsa its thickness shall not be less than 12mm and its density shall not be less than 130kg/m³.

If the core is of foam its thickness shall not be less than 15mm and its density shall not be less than 80kg/m³.

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/m².

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/m².

The beams shall have a balsa or foam core of density not less than 80kg/m³.

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/m² giving a minimum weight on the face of the beams of 7kgm². This laminate shall extend not less than 30mm from each side of the deck beam nor more than 50mm.

Additional laminates, minimum 3kg/m², shall be used in way of mast, rigging and other high stress areas to strengthen the moulding.

Plywood or foam of min. 200kg/m³ 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/m².

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 m² 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).

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 bulkhead and one internal athwartships partial bulkhead, each not more than 70mm thick.
- (b) Aft of the cockpit a longitudinal 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 bulkheads at the aft end of the cabin and in way of the mainsheet arrangement.
- The fitting of these bulkheads and any resultant removal of corrector weights shall not require the yacht to be re-swung in accordance with rule 10.20
- .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.
- 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.

3.40 Floorboards

- 3.41 Floorboards shall not exceed 16mm in thickness and shall be of wood or GRP. Floorboards shall not create or form part of any watertight compartment. [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 1.2m².
- 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.
- In the case of yachts built and measured before 1st March 1988 station 8 on the keel shall be within 10mm of the station 8 mark on the hull.
- 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 1st 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 diagrams 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/m³ 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).
- 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 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 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 of any 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 of any 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 30mm 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 13kg when it is supported at the lower measurement band and weighed at the upper band. For the purpose of the 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 foot 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 No part of the spinnaker boom, including fittings, shall be capable of extending more than 2250mm from the surface of 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 only in length vertically with turnbuckles or other means of thread.
- 7.40 Adjustment of the forestays and shrouds is prohibited while 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 2001-2004, except where varied herein.
- 9.12 Sails shall be made of woven polyester cloth and the body of the sails shall be of single ply construction. The sizes of the reinforcements are optional. The weight of any such reinforcements shall be within the limits specified below:

Mainsail, Headsail (formerly headsail number 1):	270g/m ² minimum 304g/m ² maximum
Genoa:	150g/m ² minimum 304g/m ² maximum
Spinnaker:	38g/m ² minimum

Note: A sail may be made of different cloth weights within the above limits. The weight in g/m² 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). As an alternative to checking the weight of the cloth, sails shall be considered to comply with weight requirements if they meet the scale of equivalent thickness in the ISAF Equipment Rules of Sailing.

- 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 1.2m². 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 no letters and numbers have to be placed on the Genoa.
- 9.15 Double-luffed sails (except as permitted in rules 9.34 and 9.43) and loose-footed mainsails are prohibited.
- 9.16 Each sail shall be measured and approved by an official measurer who shall stamp or sign and date a mainsail or headsail near the tack, and a spinnaker near the head.
- 9.17.1 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 of 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 shall be found by placing the centre of the clew cringle over the tack.

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

- 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.
- 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 pages 29/30). 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 bilge pump.
 4. Three life jackets or buoyancy vests with a positive buoyancy of minimum 5kg each.
 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. One bucket or bailer of not less than 9 litres.

12. PROHIBITIONS

- 12.10 Altering the effective length of the shrouds or forestay while racing is prohibited.
- 12.20 Digital compasses and 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 the National Authority in races confined to yachts of its nationality.
- 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 three persons on board while racing.
- 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 immediately previous to the regatta, re-weighing during the regatta shall not take place unless there is a change of crew.