2005
INTERNATIONAL 470
CLASS RULES

Authority*: International Sailing Federation

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

1. GENERAL

1.1 The 470 is a One-Design racing dinghy with an overall length of 4.70m for a crew of two, designed by Andre Cornu. The intention of these rules is that the boats shall be as alike as possible in all respects affecting speed and ease of handling in order that racing success shall depend on the skill of the crew.

1.2 Anything not specifically authorised by these rules is prohibited.

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

1.4 These rules are complementary to the plans, measurement diagram and measurement form. Any interpretation shall be made by the ISAF in consultation with the 470 International Class Association (470 International) and the Designer.

1.5 In the event of discrepancy between these rules, the measurement form, measurement diagram and/or the plans, the matter shall be referred to the ISAF.

1.6 In countries where there is no National Authority for Yachting (NA)* or the NA does not wish to administer the class its functions as stated in these rules shall be carried out by 470 International or its delegated representatives (National Associations).

1.7 Neither the ISAF nor 470 International accept any legal responsibility in respect of these rules and/or the plans or any claim arising therefrom.

2. ISAF PLAQUE

2.1 The International Class Fee (ICF) shall be paid by the builder on every hull built, whether or not it is subsequently measured and registered. Payment shall be made direct to ISAF which will issue an ISAF plaque.

2.2 The amount of the ICF shall be revised annually by the ISAF in consultation with the 470 International.

2.3 The ISAF plaque shall be affixed to the starboard sidetank close to the transom.

2.4 No hull shall leave the builders' premises without the ISAF plaque affixed.

3. BUILDERS

3.1 Moulded hulls and decks shall be produced only by builders licensed by the ISAF. Hull and decks shall be supplied only as permanently assembled boat units.

3.2 Application for a licence shall be made through a NA to the ISAF. The licences shall include clauses requiring good standards of manufacture, compliance with class rules and plans and a guarantee that all fees shall be paid. The ISAF

shall consult with 470 International before granting any licence and only sufficient licences will normally be issued in a country to ensure that demand is satisfied.

Alteration to plugs or moulds made without the approval of the ISAF shall result in the builder's licence being revoked. This same measure shall be taken in case of intentional and/or repeated infringements of the class rules, by the builder.

4. REGISTRATION AND MEASUREMENT CERTIFICATE

4.1 No boat shall take part in class races unless it has a valid measurement certificate in the owner's name. The measurement certificate is only valid if the owner is a current member of a national 470 Class Association or, if there is no national 470 Class Association in his nation, member of the 470 International. The certificate is obtained as follows:

(a) The owner or builder shall apply to the appropriate NA for a sail number quoting the ISAF plaque number.

(b) Each country shall issue sail numbers, which shall be consecutive beginning from 1, preceded by the National letter. In accordance with ISAF RRS Appendix G1.1 (c), the MNA or NCA may issue personal sail numbers (Sail numbers staying with the owner for every boat he legally possesses as long as he sails 470) for which the authority may raise a fee. This number must be shown on the Certificate and shall not conflict with existing numbers of active boats. After the sale of the boat, the new owner has to use her original sail number or his own personal number on his sails.

(c) The boat shall be measured before leaving the builder's premises by a measurer officially recognised by a NA. The measurement form shall be supplied to the owner of the boat. In the case of a part-built boat the owner shall be responsible for arranging completion of measurement by an Official Measurer.

(d) The owner is responsible for sending the completed measurement form to his NA, together with any registration fee that may be required. On receipt of this a certificate may be issued to the owner.

4.2 Change of ownership invalidates the certificate and the old certificate shall be returned to the NA together with a written application containing the name and address of the new owner and any re-registration fee that may be required by the NA. A certificate shall then be issued to the new owner.

5. MEASUREMENT

5.1 The boat shall be measured in accordance with the rules current when she was first measured, except that fittings, centreboard, rudder, spars and rigging shall comply with the current rules. **Sails** shall comply with the **class rules** in force at the time of **fundamental measurement** unless specified otherwise in these **class rules**.

Measurement of sails after 1 March 1998, shall be carried out in accordance with the Equipment Rules of Sailing (ERS). Where a term is used in its defined

sense, it is printed in '**bold**' if defined in the ERS and in '*italic*' if defined in the Racing Rules of Sailing.

5.2 Only a measurer officially recognised by a NA and 470 International, or a person with an approved Measurement Licence, in accordance with 5.3, shall measure a boat, its spars, sails, and equipment and sign measurement forms,

5.3 A measurer shall not measure a boat, spars, sails or equipment owned or built by himself, or in which he is an interested party or has a vested interest unless he has a Measurement Licence for spars, sails, rudder or centreboard approved by 470 International.

5.4 If a measurer is in any doubt as to the legality of any part of the boat, spars, sails or equipment, he shall report accordingly on the measurement form and shall inform the ISAF and 470 International immediately.

5.5 Alterations, replacements or repairs to the boat may be made provided they are in accordance with these rules, but alterations to the external shape of the hull, deck or sidetanks are prohibited. Alterations, replacements or repairs changing any measurement on the measurement form shall be checked by an official measurer.

5.6 New or substantially altered sails shall be checked by an Official Measurer and stamped or signed and dated by the measurer near the tack.

5.7 Templates used for official measurement shall be supplied by the ISAF.

5.8 Inspection of boats and sails at a championship or open meeting may be carried out by an Official Measurer, or by an official of the 470 National or International Association, if either of those bodies is assisting in organising the meeting.

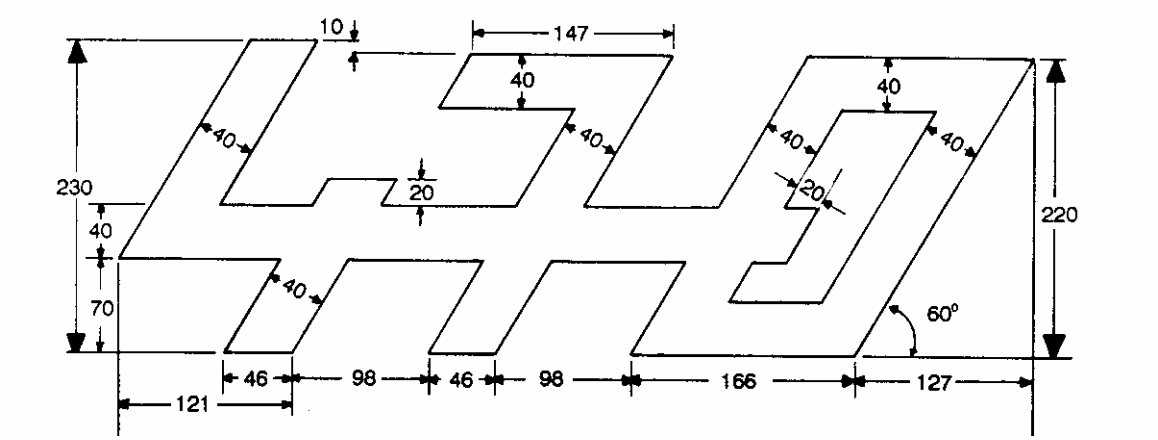
5.9 At first measurement an official measurer shall check the watertightness of buoyancy tanks, hatches and drainplugs. Thereafter, it is the responsibility of the owner to ensure the watertightness of these. If the measurer is in doubt he may order an immersion test, afterwards checking the tanks for signification leakage. If the buoyancy is unsatisfactory the certificate shall be withdrawn and not returned until successful remedial measures have been taken.

5.10 It shall be the owner's responsibility to ensure that the boat complies at all times with the class rules, but the builder shall be liable to rectify at his own expense any fault proved to have occurred in building.

6. IDENTIFICATION MARKS

6.1 The hull shall carry, either moulded in or on a plate, permanently fixed, the builders mark, serial number and mould number, which also appear on the certificate. In addition the builder's serial number shall be moulded on the outside of the transom (starboard).

6.2 The hull shall carry the official ISAF plaque fixed on the starboard side tank close to the transom and bottom.



6.3 Identification on sails

(a) The mainsail shall carry the 470 emblem in dark blue (neither light blue nor black). The 470 emblem shall be placed under and in close proximity to the upper **batten pocket** and shall conform to the diagram with a tolerance of 2mm.

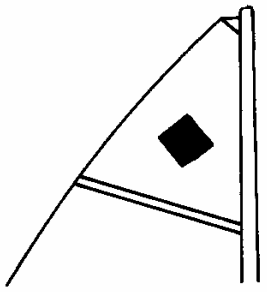
(b) (i) The mainsail shall carry the national letters and sail number in red. They shall be placed as shown in the diagram and shall be of the following minimum dimensions:

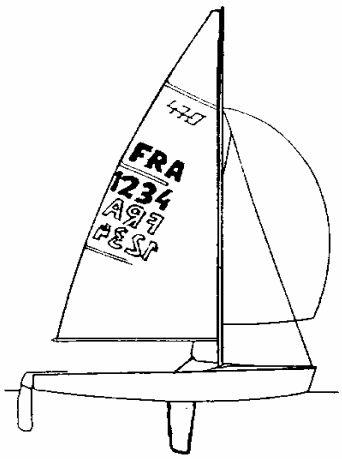
Height:	300mm
Thickness:	45mm
Width:	200mm (except number one and I)

Minimum space between adjoining figures: 60mm

(ii) With reference to RRS H 1.1(c) the sail number to be carried on the mainsail and on the spinnaker shall correspond to the last four digits of the official sail number issued according to Class Rule 4.1(b). Measurement certificates shall include the official registered sail number and the identification sail number if shorter.

(c) Mainsails used in women only events shall carry a red rhombus (length of diagonals 250mm ± 10mm) above the top **batten pocket** on both sides. The position should be approximately in the centre of the upper triangle. See diagram.





6.4 Mainsails and headsails shall carry the official **certification mark** near the tack point and spinnakers shall carry the official **certification mark** near the **head point.**

The mark shall be signed and dated by the measurer.

6.5 Routine maintenance is permitted, but altered or repaired **sails** shall be re-measured and the **official measurer** shall place a new official **certification mark** on the **sail** showing the new date of **fundamental measurement**.

6.6 All sail emblems, marks and numbers shall be of paint or other durable material securely attached.

7. CONSTRUCTION

7.1 The boat shall be built by a licensed builder in accordance with these rules and the current official plans. The construction and appearance shall conform with the Building Specification Plan except where temporary alternatives have been approved for the builder by the ISAF in writing. All boats from any one builder shall be built to the same detailed specification submitted by the builder to the ISAF.

Boats certificated before 1st March 1993 shall be in accordance with the Class Rules and plans on construction effective when first certificated.

7.2 The ISAF, 470 International or a National Authority may carry out any appropriate testing procedure, including drilling holes through any part of the boat, in order to check compliance with Rule 7.1.

7.3 The addition of local reinforcement of GRP, wood, plywood or metal as backing for fittings is permitted. Holes may be drilled in the structure for the fastening of permitted fittings.

7.4 All fittings, fastenings and local reinforcement for fittings shall be only for their normal purpose and shall not be used to increase the weight of the boat.

7.5 Non slip material not exceeding 4mm in thickness, tape and low friction material may be added to the boat as long as it does not change the stiffness of the boat.

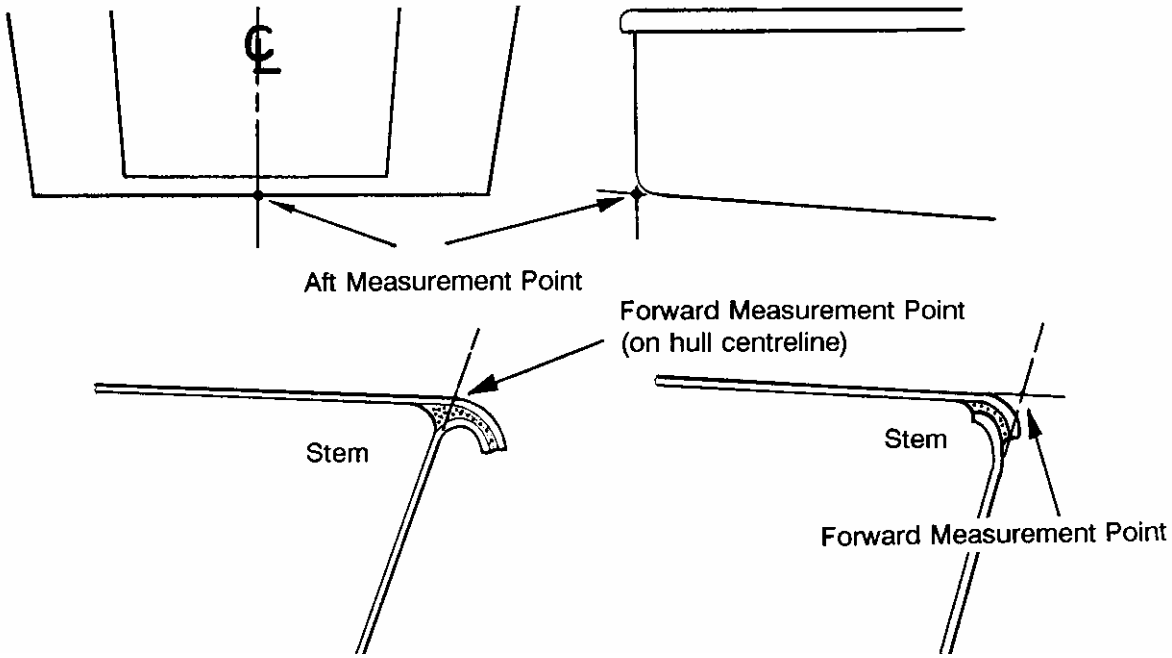
7.6 When racing all holes in the buoyancy tanks shall be made watertight. Each inspection hole shall have detachable cover capable of resisting accidental dislodgement and such covers shall be kept in place all times when racing.

7.7 The outside of the hull shell shall be white except that the name of the boat, respective drawings, registration marks, club name and possible advertising maybe of any colour.

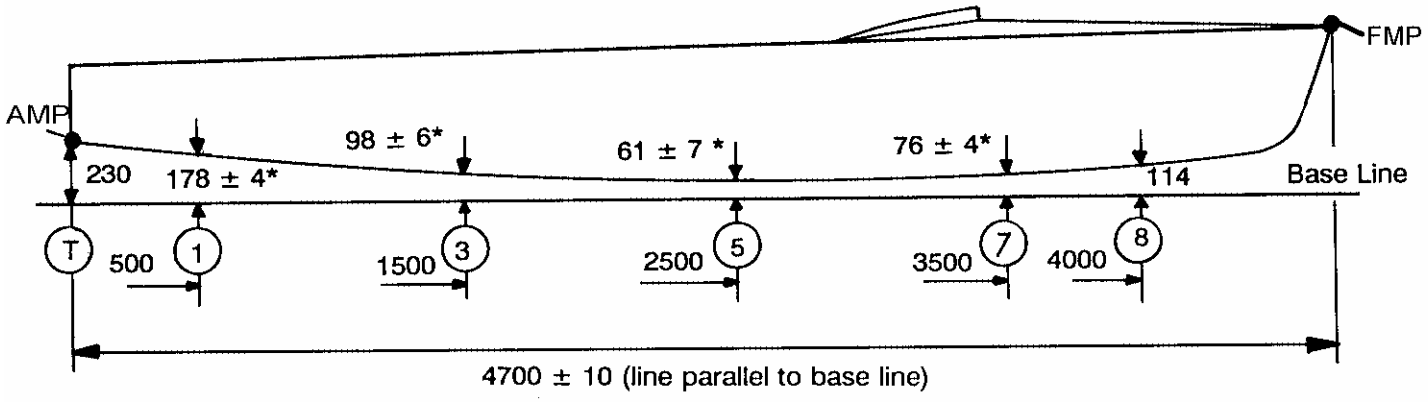
8. HULL MEASUREMENT

All measurements carried out from the Aft Measurement Point (AMP) shall be made parallel to the baseline.

8.1 The length overall of the hull, excluding deck overlap, shall be 4700mm ± 10mm, from the Aft Measurement Point (AMP) to the Forward Measurement Point (FMP) measured parallel to the baseline.

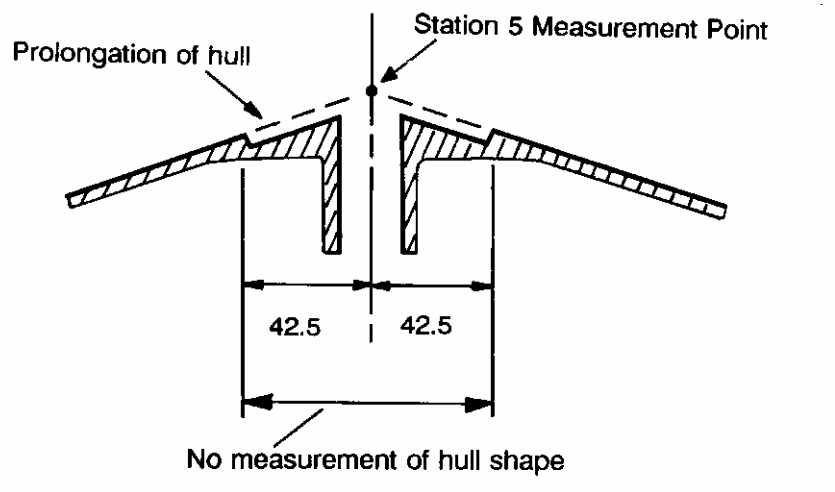


8.2 Measurement sections, transom, 1, 3, 5, 7, and 8 shall be at 0mm, 500mm, 1500mm, 2500mm, 3500mm and 4000mm respectively from the Aft Measurement Point on the transom.

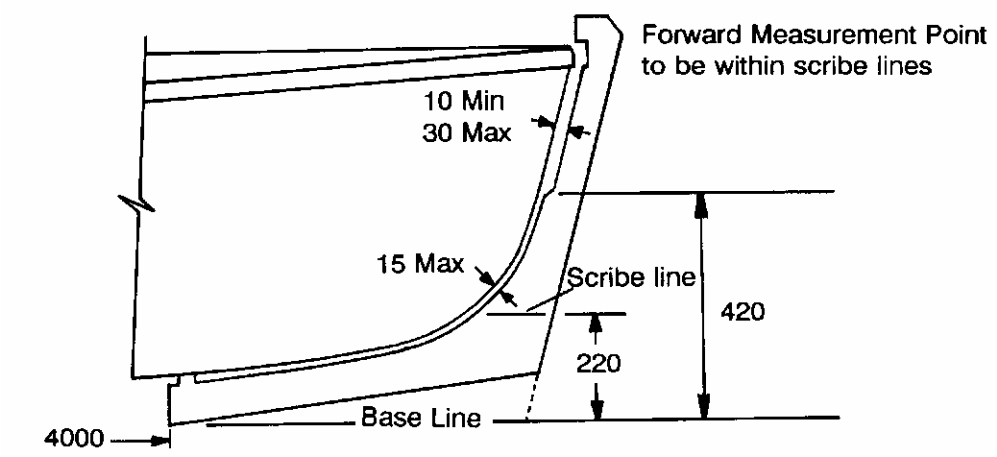


8.3 To check the profile of the keel a base line shall be fixed at 230mm below the lowest point of the transom and 114mm below the keel at section 8. The distance between the base line and keel shall not differ from the figures on the measurement diagram by more than 4mm at station 1 and 7, 6mm at station 3

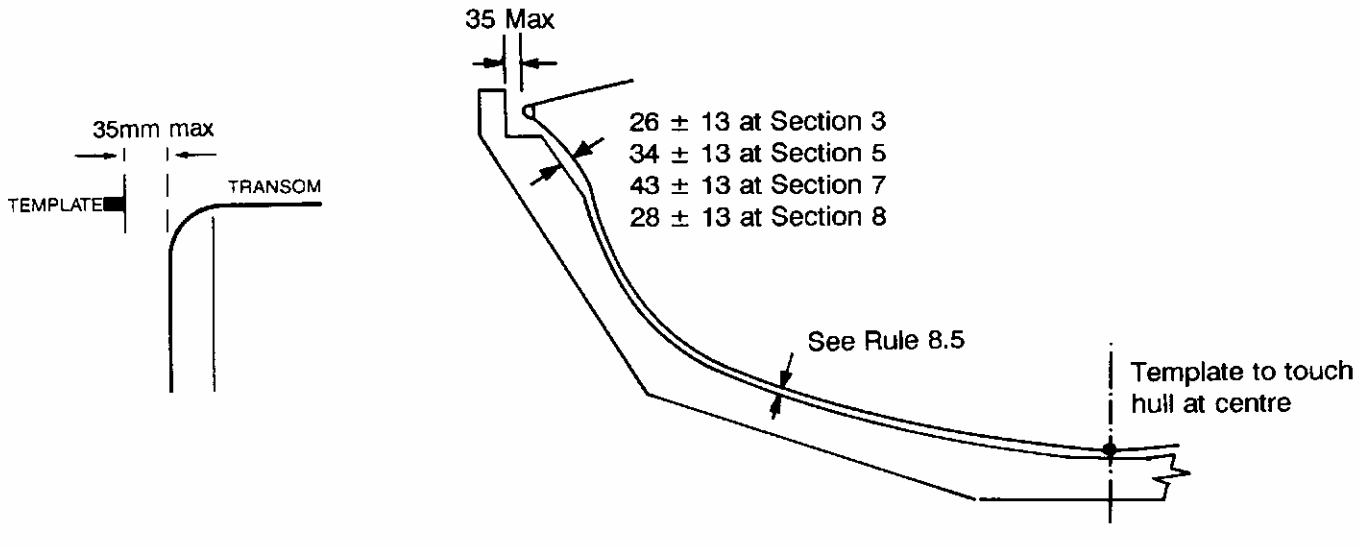
and 7mm at station 5, and the algebraic differences of the maximum positive and maximum negative deviations shall not exceed 10mm.

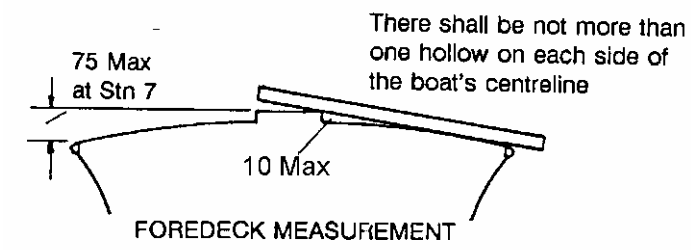


8.4 The stem template shall be applied as shown on the measurement diagram. Between the sheerline and a point 420mm above the baseline the template shall clear by not less than 10mm nor more than 30mm. Below the 420mm point the template shall touch lightly or clear by not more than 15mm.



8.5 Templates for the transom and section 1, 3, 5, 7 and 8 shall be applied as shown on the measurement diagram. The top of the deck at the sheerline shall





not be more than 10mm above or below the sheer marks on the templates. The templates shall touch the gunwale rubbing strakes lightly or clear by not more than 35mm. At the transom the distance to the template shall be defined as shown in the diagram.
Below the points 420mm above the baseline the clearance between the hull and the templates shall be between 5mm and 15mm at the transom and between 3mm and 17mm at stations 1, 3, 5, 7 and 8. The total difference between the greatest and least clearances shall not exceed 7mm at the transom and 10mm at the other sections. Above the line 420mm above the baseline, the maximum distance of the surface of the hull from the templates shall be 26mm ± 13mm at section 3, 34mm ± 13mm at section 5, and 43mm ± 13mm at section 7. At section 8 from the template above the line 520mm above the baseline the maximum distance of the surface of the hull shall be 28mm ± 13mm.

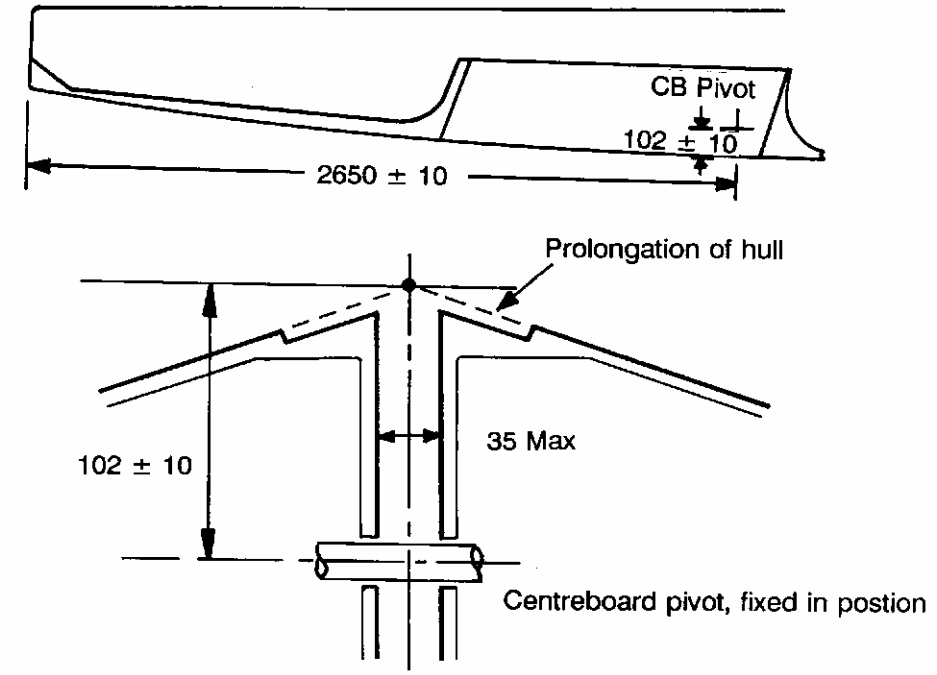
8.6 The measurer shall test the surface of the hull with a flexible batten to ensure that the shape is fair.

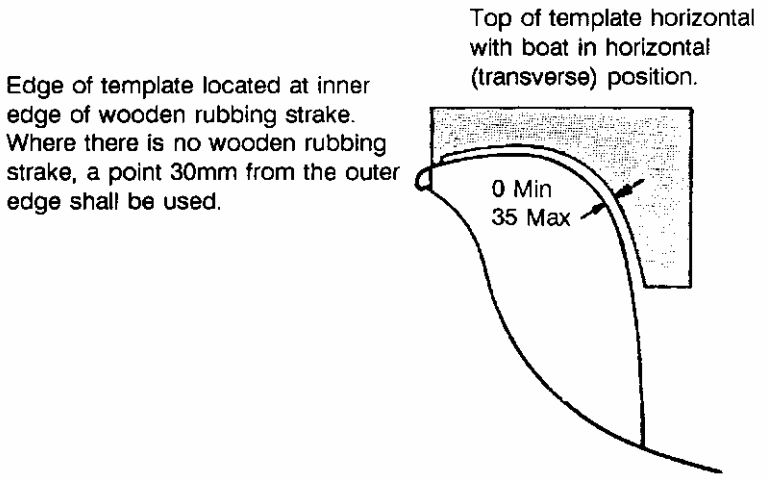
8.7 (i) The distance of the centre of the centreboard pivot from the Aft Measurement Point shall be 2650mm ± 10mm and its height shall be 102mm ± 10mm measured in accordance with the diagram. The pivot pin shall pass through the centreboard box and be in a fixed position.

(ii) To reduce the distance between the centreboard and centreboard case, fixed battens or spacing pieces made of wood or plastic of minimum length 300mm are permitted. No fitting or device shall be attached to the inside of the centreboard case which could cause the centreboard to gybe (angle to windward).

8.8 At section 7, the centre of the foredeck shall be not more than 75mm above the top of the deck at the sheerline. A straight edge placed on the centreline of the foredeck shall be nowhere more than 5mm from the deck. At the centreline the aft face of the breakwater shall be 3250mm ± 30mm forward of the Aft Measurement Point and at the sheer 2830mm ± 30mm. The breakwater shall be not less than 40mm high at the centreline.

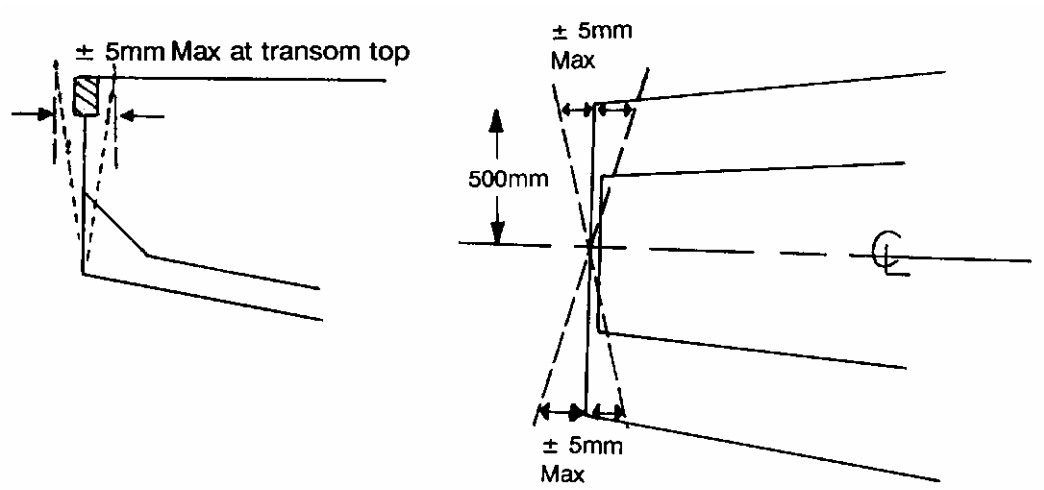
8.9 The shape of the side tanks surface above 280mm from the hull shall be verified by a template at section 4. The template shall touch the tank lightly or clear by not more than 35mm. The distance between the tanks (intersection





with the hull shell) shall be verified at the transom (580mm), at section 4 (830mm), and at section 6 (770mm) with a tolerance of ± 30mm.

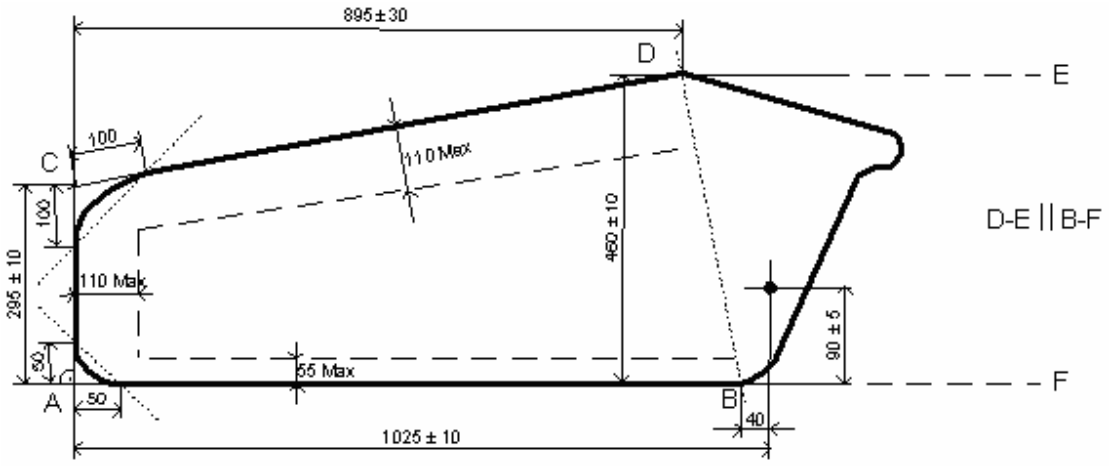
8.10 The permitted vertical and horizontal tolerances of the transom are shown in the diagram.



9. CENTREBOARD

9.1 The centreboard shall be made with only the following materials: wood, plywood, polyester or epoxy reinforced with glass fibre, and plastic foam (which includes micro balloons), and may be painted.

9.2



The contour of the centreboard is defined by the points A, B, C, D and the lines DE and BF.

The leading (AB) and the bottom edge (AC) build the reference for the dimensions and shall be square to each other.

The leading (AB) edge shall be straight within a tolerance of 2 mm from a point 50 mm of point A to a point 985 mm of point A.

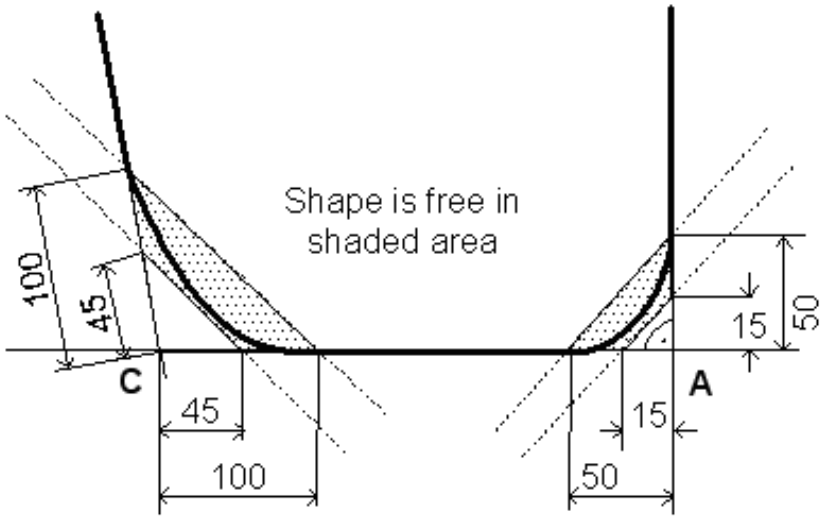
The lower (AC) edge shall be straight within a tolerance of 2 mm, from a point 50 mm of point A to a point 195 mm of point A.

The trailing edge (CD) shall be straight within a tolerance of 2mm, except within 100 mm of point C.

The shape inside the area EDBF is free.

The centre of the pivot hole shall be at 90mm ± 5mm aft of the leading edge and 1025 ± 10mm above the lower edge.

The shape of the lower corners of the centreboard shall lie within the shaded areas in the Figure below.



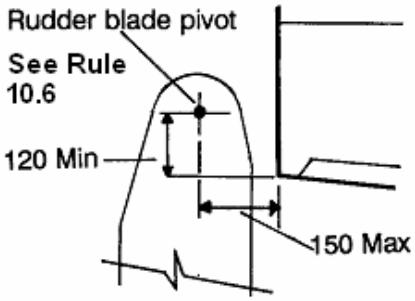
9.3 The centreboard shall be of even thickness throughout 22mm ± 2mm, except that the edges may be reduced as defined in rule 9.4. It shall not be pierced by lightening holes. Except for permitted reducing the thickness shall not vary by more than 1mm.

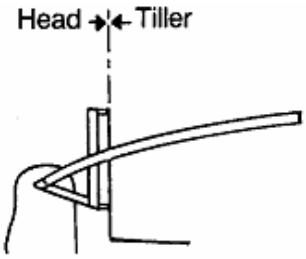
9.4 The thickness of the centreboard may be reduced over distances of 110mm from the trailing and lower edges and 55mm from the leading edge.

9.5 The centreboard, when dry and excluding fittings, shall weigh not more than 6.5kg nor less than 4.5kg. Corrector weights are not permitted.

9.6 In its raised position, no part of the centreboard shall project below the hull.

10. RUDDER





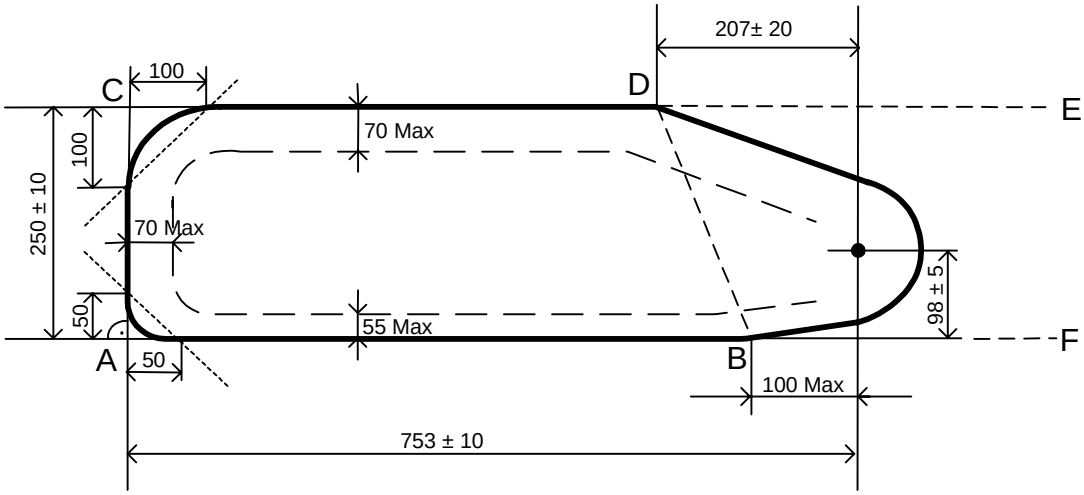
Definition of rudderhead/tiller

10.1 For boats first measured after 1st March 2002, the rudder head, and tiller shall only be made of aluminium alloy and/or stainless steel. The rudder head shall not act as an extension of the hull

10.2 The rudder blade shall be made with only the following materials: wood, plywood, polyester or epoxy reinforced with glass fibre, or plastic foam (which includes micro balloons) and may be painted; its weight when dry shall be not less than 2.3kg including only the uphaul and downhaul ropes, if fitted.

Corrector weights, if any, shall be permanently incorporated in the rudder blade and shall be of lead.

10.3



The contour of the rudder blade is defined by the points A,B,C,D and the lines DE and BF.

The leading (AB) edge shall be straight within a tolerance of 2 mm, except within 50 mm from point A.

The lower edge (AC) shall be straight within a tolerance of 2 mm, except within 50 mm from point A and 100 mm from point C.

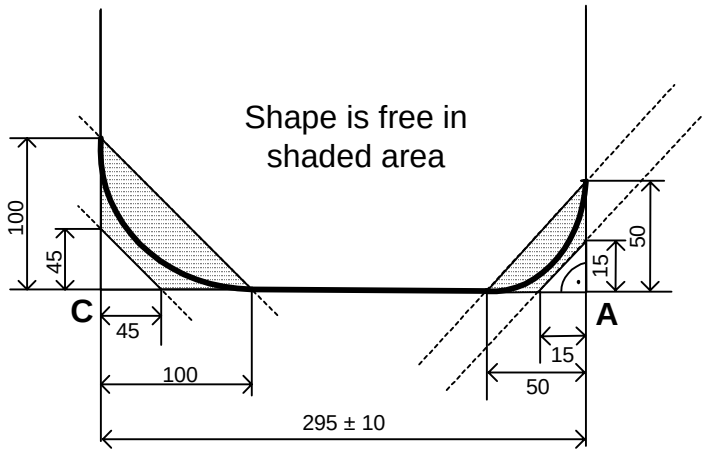
The leading and the bottom edge shall be square to each other.

The trailing edge (CD) shall be parallel to the leading edge and straight, with a tolerance of 2 mm, except within 100 mm from point C.

The shape inside the area EDBF is free.

The centre of the pivot hole shall be at 98mm ± 5mm aft of the leading edge and 753 ± 10mm above the lower edge.

The shape of the lower corners of the rudder blade shall lie within the shaded areas in the Figure below.



10.4 The rudder shall be of even thickness throughout 22mm ± 2mm, except that the edges may be reduced as defined in rule 10.5. Except for permitted reducing the thickness shall not vary by more than 1mm.

10.5 The thickness of the rudder may be reduced over distances of 70mm from the trailing and lower edges and 55mm from the leading edge.

10.6 With the rudder in the fore-and-aft position on the transom the distance of the pivot abaft the transom and its height above the lower corner of the transom shall conform to the dimensions on the measurement diagram.

10.7 The blade shall be able to pivot around its axis. There may be a bushing round the pivot. The blade may be fixed by two control lines and two cleats; one block per control line is allowed. The control line may be fixed on the rudder blade by an eye-bracket. The tiller may have an extension which may be telescopic and of any material. The lower rudder fitting shall not form an extension of the hull surface. The rudder shall be detachable from the hull.

10.8 A safety device may be fitted so that the rudder cannot lift on its pintles.

11. MAST

11.1 The mast shall be constructed of aluminium alloy.

11.2 The athwartship dimension of the mast at any point within 5010mm of the heel shall be not more than 75mm nor less than 55mm. The fore and aft dimension at any point more than 1550mm and less than 5010mm from the heel shall be not more than 75mm nor less than 65mm, and in this region the mast section shape and wall thickness excluding external luff groove shall be constant. Reinforcement is permitted in the regions of the mast partner, spreaders and the connection if the mast is made of two parts. A cut-off for sail entry is permitted.

11.3 The mast when supported horizontally with the groove uppermost at the upper coloured band and a point not more than 100mm from the heel shall deflect not more than an additional 200mm when loaded with 25kg at a point midway from either support. With the mast suitably supported on its side it shall deflect by not more than an additional 130mm when similarly loaded with 15kg.

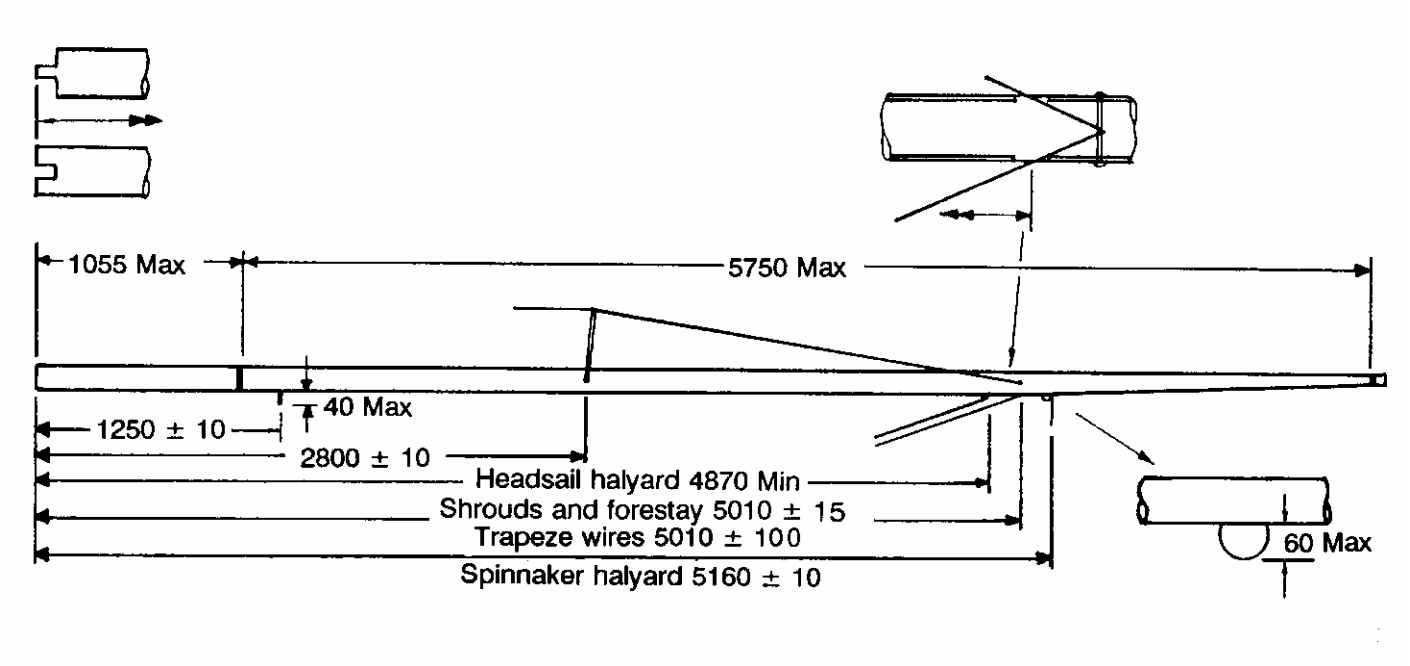
11.4 The aft edge of the mast above the sail entry shall be straight; however a permanent set due to deformation of up to 40mm is permitted from the line joining the upper measurement band to the heel.

11.5 The weight of the mast with rigging and usual fittings but without compass and compass fittings shall not be less than 10kg. The compass bracket if permanently mounted on the mast shall be included in the mast weight.

11.6 Measurements from the heel of the mast shall be taken from the bottom of the heel fitting, including any tenon.

11.7 The centre of gravity of the mast in weighing condition shall be not less than 2800mm above the heel, with the rigging dressed along the mast.

11.8 Distinctively coloured bands of not less than 10mm width shall be placed to conform to the measurement diagram

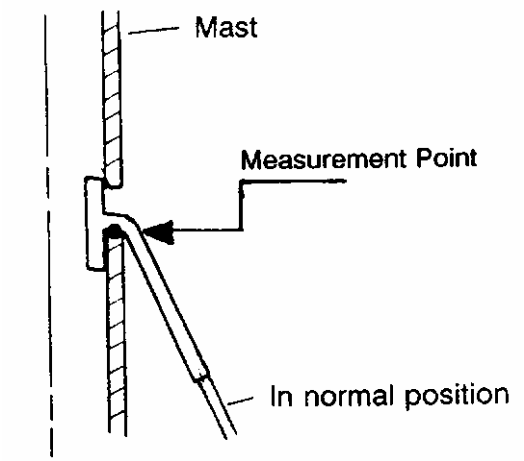


11.9 Only the following are permitted:

(i) Sheaves and a rack or cleat for main halyard, the halyard and a device for preventing the main sail from being set above the lower edge of the upper measurement band.
(ii) Mast head support device for mainsail. The sail shall be capable of being hoisted and lowered when the boat is afloat upright.
(iii) Halyard, sheaves and a tensioning system for headsail halyard.
(iv) Sheaves and/or eyes and cleats for spinnaker halyard, which shall not project more than 60mm forward of the mast and the halyard.
(v) A pair of rigid or swinging metal spreaders with their attachment systems.
(vi) A gooseneck for the boom. If the gooseneck is able to slide a stop shall be fitted so that the top of the boom cannot move below the top of the lower band on the mast.
(vii) A fixed spinnaker boom attachment at 1250mm ± 10mm above the heel of the mast no part of which shall extend more than 40mm from the mast, and a lift and a downhaul system.
(viii) Fitting(s) for kicking strap attachment.
(ix) A fitting for centreboard hoist blocks.
(x) A fitting by the top of the mast for a flag halyard or a wind indicator and a cleat.
(xi) Fittings for the Cunningham adjustment of the mainsail
(xii) Rubber cords to fix the trapeze wires approximately at the height of the spreaders.
(xiii) A compass and attachment fittings for same.
(xiv) A fitting to fix the mainsail tack.
(xv) Devices attached to the spreaders to prevent spinnaker halyard from getting tangled.

11.10 The positions of the centre of the spinnaker boom fitting, the centre of the spreader fitting, the top of the headsail halyard sheave, the point of attachment of the spinnaker halyard, and the intersection of the lines of the shrouds and

the trapeze wires with the outside of the mast shall conform to the measurement diagram.

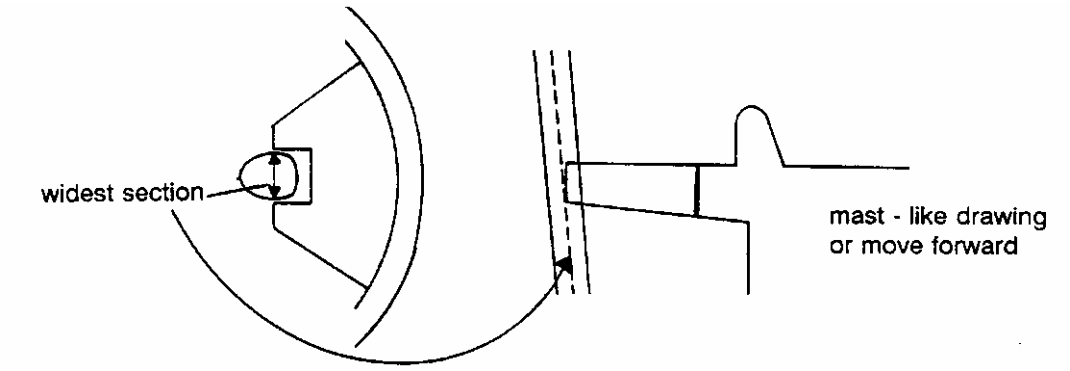


11.11 The measurement point of a hammerhead shroud fitting will be as shown.

12. RIGGING

Only the following rigging is permitted:

12.1 The mast shall be supported by a forestay and one shroud on each side. These shall be of steel wire rope, diameter not less than 2.3mm. The forestay shall be attached to a stemhead fitting, which shall be provided with one hole each for forestay and headsail. The forestay under tension shall be entirely in metal and shall not allow the mast to disengage from the mast partners. To meet this requirement the widest section of the mast shall be within the mast partners when the forestay is under tension.



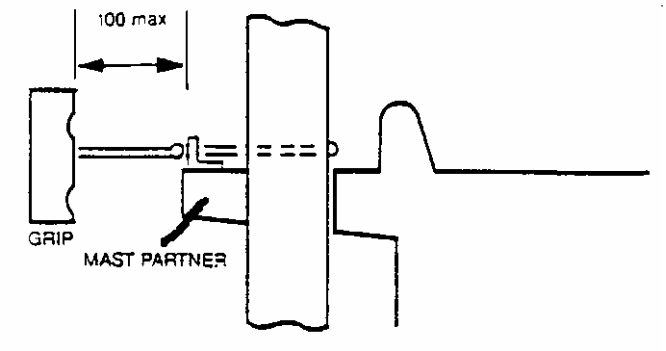
12.2 An elastic shockcord, fixed to the forestay and the stemhead fitting to maintain tension in the forestay is permitted. Each shroud shall be attached with one pin to the shroud plate by means of plates having rows of adjustment holes. No other arrangement of shroud adjustment is permitted. The effective length of the shrouds shall not be adjusted while racing.

12.3 One trapeze wire on each side for the use of one person only shall be fitted, of steel wire rope of diameter not less than 2.3mm. Each trapeze wire may be provided with handholds, rings, adjustment and an elastic cord return system with fairleads. The trapeze hook shall not be able to run from one side of the boat to the other. Titanium trapeze hooks are prohibited.

12.4 The bend of the mast may be controlled at the mast partner as follows:

(i) To control the fore and aft mast bend the following equipment is allowed: either wooden blocks between the mast and mast partner (forward of the mast), or optional system(s) of rope(s), wire(s) with attachment(s), cleat(s) and grip(s), all on top of the mast partner. With the mast in its most forward position the grip of the aft bend control shall be not more than 100mm from the mast partner. With the mast in its most aft position the grip of the forward bend control shall not be more than 100mm from the mast partner.

(ii) To limit the play sideways: Between the mast and the mast partner, strips of any material may be added to the mast partner but these may not be adjustable.



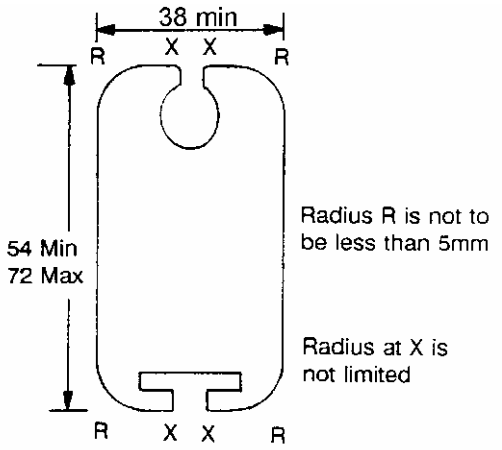
12.5 No additional rigging or fittings are permitted, the purpose of which is to affect the bend of the mast.

12.6 Rod rigging is prohibited.

13. BOOM

13.1 The boom shall be constructed of aluminium alloy.

13.2 The maximum width of the boom, over its entire length, shall be not less than 38mm. The depth at any point shall be not less than 54mm nor more than 72mm except within 75mm of each end. The cross section of the boom shall not include a convex curve of radius less than 5mm. However, this requirement shall not apply to internal tracks or grooves or to an external track fitted to the top of the boom.



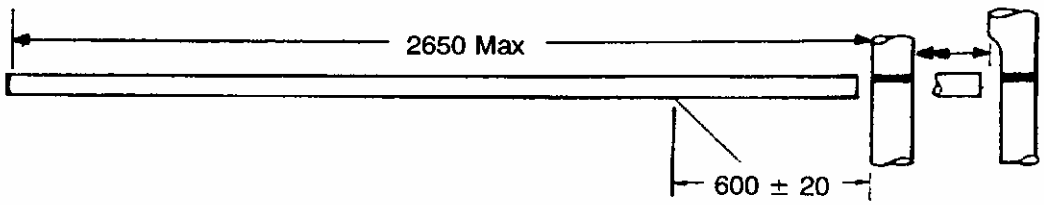
13.3 The top of the boom shall be straight when first measured. A permanent set of up to 20mm due to deformation is permitted from the line between the inner end of the boom and the coloured band.

13.4 The boom when supported horizontally with the groove uppermost between the outer band and a point 100mm from the forward end shall deflect not more than 50mm when loaded with 80kg at a point midway from either support.

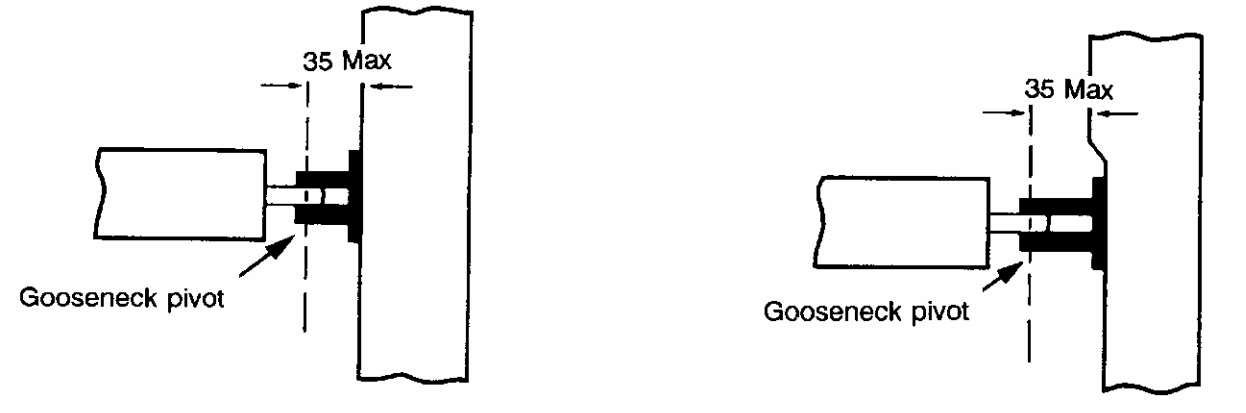
13.5 Measurements along the boom shall be taken with the boom attached to the mast. Measurements shall be taken from the downward projection of the aft edge of the mast, disregarding local projections or cut outs and with the boom at right angles to the mast. The forward extension of the line of the upper edge of the boom shall not be lower than the upper edge of the lower mast band.

13.6 A distinctively coloured band not less than 10mm wide shall be placed with its inner edge not more than 2650mm from the after edge of mast as defined above.

13.7 The length of the boom beyond the distinctively coloured band is optional.



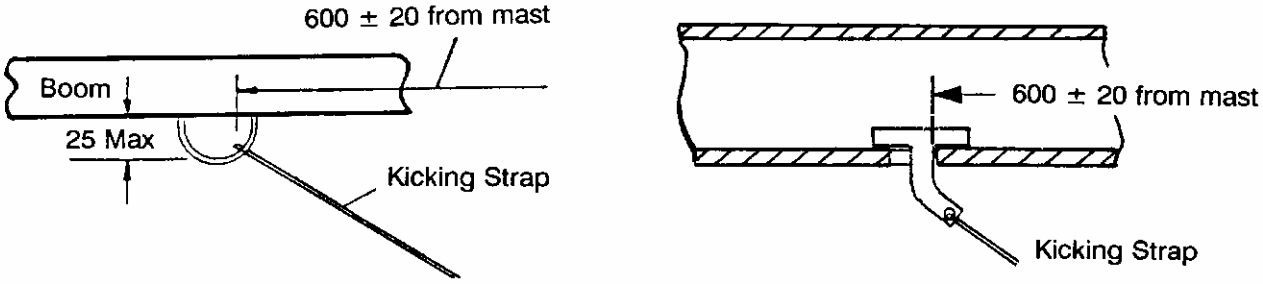
13.8 The distance between the aft face of the mast and the gooseneck pivot must not exceed 35mm.



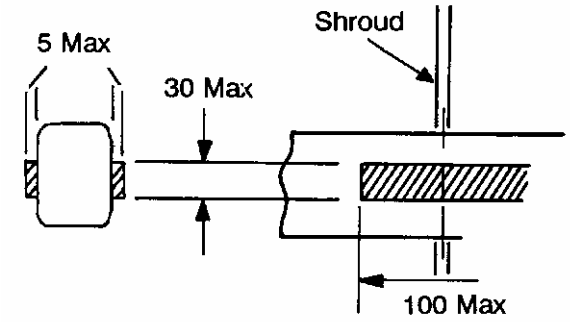
13.9 Only the following fittings are permitted:

(i) A kicking strap attachment.
(ii) A track or attachment points for mainsheet.
(iii) An attachment for aft mainsheet.
(iv) An optional system for adjusting the mainsail clew. The tack shall not be adjustable along the boom.
(v) A fitting to fix the mainsail tack.
(vi) A stopper to prevent the clew from being pulled beyond the inner edge of the measurement band.

13.10 The distance from the mast to the attachment point of the kicking strap shall be 600mm ± 20mm.



13.11 The boom may be protected in the part where it touches the shrouds by pieces of any material (maximum length/height/thickness = 100mm/30mm/5mm).



14. SPINNAKER BOOM

14.1 The spinnaker boom shall be constructed of wood or aluminium alloy.

14.2 Its overall length including fittings shall not exceed 1900mm.

14.3 Only the following fittings are permitted:

(i) A hook at each end.
(ii) Fittings approximately at the mid-point for attachment for lift/downhaul.
(iii) A fixed line between the fittings prescribed in (i), which may incorporate knots, toggles or short tubes for easier handling are permitted.

15. FITTINGS

15.1 Position of fittings:

(a) The mainsheet slide track(s) (if fitted) or metal reinforcement shall be attached to the top of the transom and/or its centreline shall be 1630mm ± 20mm from the Aft Measurement Point. If the latter, its lower surface shall be attached to the top of the centreboard case and the track shall be straight.

(b) The bearing point of the shroud in the shroud plate shall be 2780mm ± 10mm measured on the centreline from the aft face of the transom. The shroud plate may have a second hole forward, which shall not be used to attach the shroud.

(c) The centre of the headsail attachment hole in the stemhead fitting shall be 4630mm ± 15mm measured on the centreline from the aft face of the transom.

(d) The mast step, which may incorporate a means of fore and aft adjustment, shall be fitted with its bearing surface not more than 5mm above the keelson. Its fore and aft position and design shall be such that the aft edge of the mast, projected from above the sail entry, shall, at step level, be at all times 3085mm +/- 30mm from the AMP. A mark 3055mm from the AMP shall be fixed or engraved on the mast step or mouldings. The position of the mast heel shall not be adjustable while racing.

15.2 Fittings:

(a) For boats first measured after 1st March 2002, fittings shall be made of readily commercially available materials including stainless steel, aluminium, plastic, and Fibre Reinforced Plastic. Titanium is prohibited.

(i) An adjustable kicking strap.

(ii) Fixed or adjustable jib sheet fairleads or pulleys. If traveller tracks are used, only one traveller per track is permitted. Adjustment of the jib fairleads or pulleys may be remotely controlled only in one direction (e.g. fore/aft or in/out or up/down). Additional adjustments to the fairleads or pulleys are only permitted by means of prefixed positions.

(iii) The tension of the headsail sheets may be controlled by a system of winches, jamming cleats and pulleys.

(iv) An aft and/or centre mainsheet may be used. If a centre mainsheet system is used it shall be 1625mm ± 50mm from the AMP. Fittings and the adjustment system are optional, except that not more than one single sheave block is permitted on the top of the centreboard case. The following shall apply for boats first measured after 1st March 2002: If a traveller track is used, only a maximum of two travellers is permitted. The mainsheet system adjustments may only be remote controlled in one direction (e.g. in/out or up/down). Additional adjustments are only permitted adjacent to the traveller by means of prefixed

positions. Only hoops made from aluminium alloy and stainless steel are permitted.

(v) An optional system for spinnaker halyard, sheet, guy and a trimming system for the sheet and guy.

(vi) A spinnaker catcher which shall not project more than 150mm beyond the bow.

(vii) A centreboard hoist system of pulleys, elastic cord, and/or rope, cleats and fastening.

(viii) Toe straps fitted within the cockpit only. No other stability aids other than trapeze referred to in 12.3 shall be fitted.

(ix) Two rudder fittings and a latch system to prevent the rudder from becoming detached which are bolted to the transom.

(x) Hinged covers or other devices for closing draining ports or drainholes in the transom. These covers or devices shall not obstruct the rudder nor act as an extension of the bottom of the hull.

(xi) Sealing strips for the centreboard slot of optional material. A zipper is not allowed.

(xii) A centreboard pivot including bush. Antifriction strips between the centreboard case and the centreboard.

(xiii) Two self bailers, with a total effective area not exceeding 12.5cm^2.

(xiv) Not more than two compasses and mounting brackets. If compasses are recessed into the top of the buoyancy tanks, the tanks shall be made watertight if the compasses are removed.

(xv) Fittings in the cockpit for the stowage of the paddle and spinnaker boom.

(xvi) A self tensioning reel for the spinnaker halyard tail, on the mast or inside the boat.

(xvii) Bumper on top of centreboard case.

(xviii) Fairleads, sheaves, eyes and cleats for Cunningham system of the mainsail.

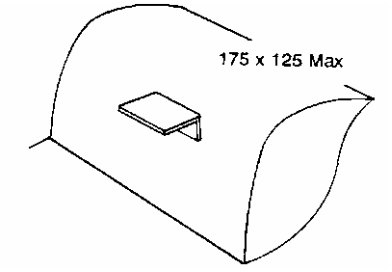
(xix) Fairleads, sheaves, eyes and cleats for spinnaker lift and downhaul system.

(xx) A rubber cord between trapeze wires to tension them including sheaves.

(xxi) Sheaves and a tensioning system for headsail halyard.

(xxii) A single cleat mounted on the foredeck, a shackle, a fairlead and a single rope for the cunningham system of the jib.

(b) Fittings may be attached to brackets not exceeding 175mm x 125mm fixed to the side tanks.



(c) No fittings, with the exception of: a spinnaker sheet catcher, rudder fittings, transom drainage flaps, shall project beyond the outboard edges of the gunwale rubbing strips or beyond the profile of the hull.

(d) Ballast shall not be carried.

(e) Control lines and/or sheets shall not pass through the buoyancy compartments or the breakwater.

16. WEIGHT

(a) The weight of the boat fully rigged and in dry condition but without sails, personal buoyancy garments, bucket, paddle, anchor and line shall not weigh less than 120kg.

(b) If the boat is found to be underweight the difference shall be made up by corrector weights, which shall not exceed 2kg for boats first certified after 28th February 1979, fastened under the mastpartner or to the top of the bulkhead on the side of the cockpit.

17. SAILS

17.1 Mainsail

17.1.1 CONSTRUCTION

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

(b) The **body of the sail** shall consist of the same **woven ply** throughout, except for the panel adjacent to the **foot** which may be of a different **woven ply**. The **ply** fibres shall be of polyester or polyamide.

(c) The sail shall be white, except for sail identification, tell tales, **certification marks**, sail button and possible advertising.

(d) The **sail** shall have 3 **batten pockets** in the **leech** with battens fitted when *racing*.

(e) In addition to rule 17.1.2, **secondary reinforcement** is permitted in the whole area above the upper **batten pocket**.

(f) The following are permitted: Stitching, glues, **tabling**, tape, bolt ropes, corner eyes, headboard with fixings, Cunningham eye or pulley, **batten pocket patches**, batten pocket elastic, top batten pocket end cap, 1 boom slide at the **clew**, leech line with cleat on leech, one **window** of single **ply** of unwoven material, sailmaker label, sail button, tell tales, identification marks, **certification marks**.

17.1.2 DIMENSIONS

	minimum	maximum
Leech length		6265 mm
Quarter width		2340 mm
Half width		1790 mm
Three-quarter width		1050 mm
Top width		140 mm
Thickness of **ply** of **body of the sail**	0.165 mm	
Primary reinforcement		325 mm
Secondary reinforcement:		

	minimum	maximum

from **sail corner measurement points (see also 17.1.1(e)** ...		1000 mm
from the **leech**		300 mm
Window area		0.3 m^2
Window height		600 mm
Shortest distance from **window** to **sail edges**	150 mm	
Greatest dimension of headboard from **head point**		140 mm
Inside batten pocket length of two lower pockets		800 mm
Intersection of a **batten pocket** centreline and **leech** to adjacent cross width measurement point		100 mm
Head point to intersection of **luff** and lower edge of uppermost **batten pocket** when the **luff** is stretched to a maximum of 5750 mm	1700 mm	1800 mm
Distance from **tack point** to **luff** and **foot** boltrope		300 mm
Distance from **clew point** to **foot** boltrope		60 mm
Distance from **head point** to **luff** boltrope		100 mm

17.2 Headsail

17.2.1 CONSTRUCTION

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

(b) The **body of the sail** shall consist of the same **woven ply** throughout. The **ply** fibres shall be of polyester or polyamide.

(c) The **sail** shall be white, except for tell tales, **certification marks**, sail button and possible advertising.

(d) The **sail** may have not more than **3 batten pockets** in total in the **leech** and the **foot**.

(e) A **luff** wire of not less than 2.3 mm shall be fitted when *racing*.

(f) The **leech** shall not extend beyond a straight line between the **aft head point** and the **clew point**.

(g) The following are permitted: Stitching, glues, tapes, tabling, corner eyes, **flutter patches**, batten pocket elastic, one **window** of single **ply** of unwoven material, sailmaker label, sail button, tell tales, **certification marks**.

17.2.2 DIMENSIONS

	minimum	maximum
Luff length	.....	4100 mm
Leech length	.....	3750 mm
Foot length	.....	1955 mm
Foot median	.....	3950 mm
Top width	.....	30 mm
Foot irregularity	.....	30 mm
Thickness of **ply of body of the sail**	0.165 mm	
Primary reinforcement	.....	275 mm
Secondary reinforcement		
from **sail corner measurement points**	.....	750 mm
for 1 **chafing patch** on the **luff**:		
along the **luff**	.....	300 mm
at 90° to the **luff**	.....	50 mm
Window area	.....	0.3 m^2
Window height	.....	600 mm
Shortest distance from **window** to **sail edges**	150 mm	

Inside batten pocket length..... ..... 250 mm

17.3 Spinnaker

17.3.1 CONSTRUCTION

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

(b) The **body of the sail** shall consist of **woven ply** of same weight throughout. The **ply** fibres shall be of polyester or polyamide.

(c) The following are permitted: Stitching, glues, tapes, **primary reinforcement** at corners**, secondary reinforcement**, corner eyes, tape eyes, sailmaker label, sail button, identification marks, **certification marks**.

17.3.2 DIMENSIONS

	minimum	maximum
Leech lengths		4360 mm
Foot length		3000 mm
Foot median		5100 mm
Half width		3450 mm
Three-quarter width		1830 mm
Upper width with **leech points** at 200 mm		350 mm
Difference in **diagonals**		50 mm
Primary reinforcement		300 mm
Secondary reinforcement		unlimited

18. EQUIPMENT

18.1 The following equipment shall be on board when racing:

(a) An anchor or paddle is not required to be carried unless specified in the Sailing Instructions. If so specified, the anchor shall be of not less than 1kg weight, have a line of minimum diameter 4mm and minimum length 15m, and be attached to both the anchor and the boat.

(b) Two personal buoyancy garments.

(c) Two spinnaker bags of flexible material fixed on the breakwater or forward closure, mast partner and sidetanks, which do not reinforce any of these structures, and associated fittings.

(d) Towing rope of floating type with a minimum length of 10m and of not less than 8mm in diameter.

18.2 The following equipment may be on board when racing:

(a) Spare equipment, tools, extra rope, and personal items.

18.3 Only one member of the crew shall be permitted to wear a trapeze harness. The trapeze harness shall not be ballasted, shall float, and shall not weigh more than 3kg.

18.4 RRS 43.1 shall apply with the amendment that competitor's clothing and equipment shall not weigh more than 9kg including footwear and clothing worn below the knees but excluding a trapeze harness.

18.5 Up to two compasses. Electronic compasses with functions beyond heading, heading memory and timing are prohibited. No other electrical or electronic devices shall be permitted.

18.6 Electronic or mechanical timing devices, which may include a compass, and which shall be removable.

RULES FOR CLASS RACING

19. RACING RULES

19.1 Class races shall be sailed under the Racing Rules of Sailing and, except in the World Championship, Continental Championships, the Master's Championship and the International 470 Class Junior Championship, European Junior Championship, and the prescriptions of the National Authority in whose country the races are held. These rules may be varied only with the agreement of the National Authority and 470 International.

19.2 Only one set of sails, one mast, one boom, one centreboard, one rudder and one spinnaker boom per boat shall be used in a series of races except in case of authentic damage or loss.

20. CLASS RULES

20.1 The class rules shall not be varied by a race committee.

20.2 It is the owner's responsibility to ensure that the boat conforms to the rules.

20.3 Before the start of a race or series of races the crew shall produce the boat's certificate which shall be valid in the owner's name.

21. REGATTA MEASUREMENT

21.1 At championships or principal events the race committee may arrange for boats and/or sails to be partly or completely re-measured, before racing if possible. Should any boat be found to have raced while contravening class rules the committee shall take action under the RRS 60.2 and 64.3. The body to which protests on measurement are referred shall be the authority which issues certificates in the country in which the race was held.

21.2 Replacement spars, sails and foils shall be measured and stamped before use.

22. CREW

Two persons shall be on board, each in contact with the boat.

23. RUDDER

The rudder blade shall be in its fully lowered position while racing. However for races sailed in shallow water the sailing instructions may prescribe that this rule shall not apply.

24. SAIL BUTTONS or STICKERS

Each sail measured after 1st January 1985 shall have permanently fixed an officially numbered button or sticker. The buttons or stickers of the headsail and mainsail shall be near the tack, and the button or sticker of the spinnaker shall be near its top. No sail shall be accepted for its first measurement without a sail button or sticker. Buttons or stickers shall not be transferred from one sail to another. Buttons or stickers shall be obtained from the National or International 470 Class Association by the sailmakers.

25. ADVERTISING

Category C in accordance with the ISAF Advertising Code.

26. PROPULSION

In alteration to RRS 42:

26.1 If the average wind speed is above 10 knots, the race committee may display flag O with the warning signal to signal that pumping, rocking and ooching are allowed after the starting signal.

26.2 After the starting signal, if the average wind speed is above 10 knots, the race committee may display flag O with repetitive sounds at any rounding mark to signal that pumping, rocking and ooching are allowed. This rule applies to a boat after she has passed the mark.

26.3 If the race committee has acted under class rule 26.1 or 26.2 and the average wind speed becomes less than 10 knots, the race committee may display flag R with repetitive sounds at any rounding mark to signal that RRS 42 applies. This rule applies to a boat after she has passed the mark.

27. SAIL NUMBERS

Competitors may use the sail number of any hull shell still owned by them, on any boat chartered or owned by them.

28 MAINSAIL SETTING

The highest visible point of the **sail**, projected at 90^{o} to the mast spar, shall not be set above the lower edge of the upper mast measurement band**.** The **leech**, or its extension, shall not intersect the upper edge of the boom spar beyond the inner edge of the boom measurement band. Luff and foot boltropes shall be in spar grooves.

OFFICIAL PLANS

1	Lines Plan	1964
2	Building Specification Plan	1992
3	Class Emblem (Full size)	1992
4	Full Size Sections	1964
5	Full Size Sections	1964
6	Full Size detail of Stem	1964
7	Centreboard	1964
8	Rudder Blade	1964

Amended: 20th June 2005 (change of diagram in rule 9.2)
Effective: June 20th, 2005
Previous version: May 16th 2005