

PROPOSED

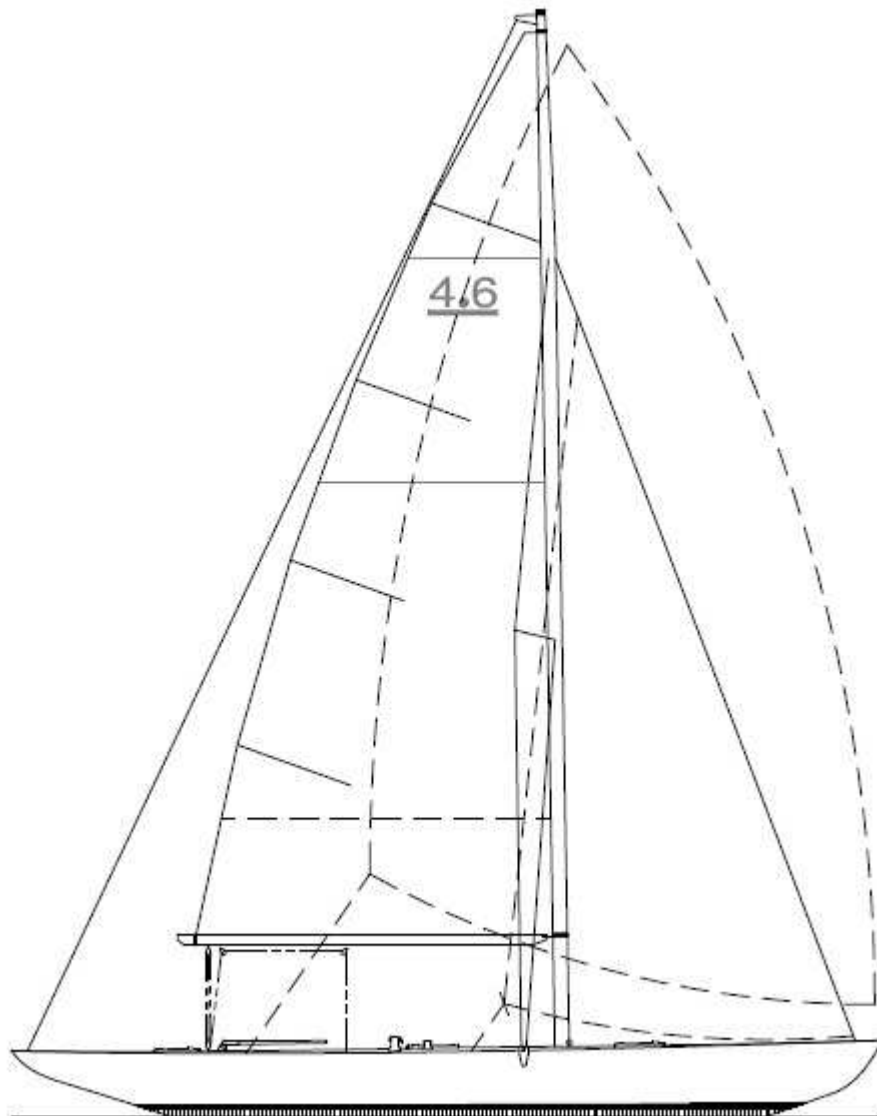
International 4.6 Meter Class

Rating Rule

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Adapted from the 2.4 and 6 meter classes

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1. INTRODUCTION

The 4.6 meter class is a development class for a two-person keelboat along the lines of the International Rating Classes.

The purpose of these rules is to give a designer the possibilities to develop and produce a fast boat within the limitations of these rules. Because of that these rules are open class rules.

2. INTERNATIONAL FORMULA

Rating in meters = $(L + 2d - F + S^{0.5})/2.37$

Where L = Length in meters
 d = Girth difference in meters
 F = Freeboard in meters
 S = Sail area in square meters

The rating shall not exceed 4.600 meters.

3. LENGTH

Overall length is not to exceed 8.50m.

The length "L" for the formula shall be the length measured at a height of 70mm above the L.W.L. plus one and one-half times the difference between the chain girth at the bow section measured to points 230mm above "L" and twice the vertical height from "L" to those points plus one-third of the difference between the chain girth, from covering board to covering board, at the stern ending of this length, and twice the vertical height at the side of the yacht at this station. For the purpose of calculating the rating the minimum difference of girth at the bow station, as defined above shall be 140mm, and minimum difference of girth at the stern station as defined above, shall be 460mm.

The afterbody of the yacht shall be so shaped that an after chain girth measurement can be taken in a vertical transverse plane intersecting the after overhang at a height of 140mm above the L.W.L (L2). If one third of the girth difference (i.e. the chain girth from covering board to covering board less twice the vertical height) at this station, (L2), is less than 65 per cent of one third of the stern girth difference at L1, the deficiency shall be added to the stern girth difference in calculating the yacht's rating. The horizontal distance from L1 to L2 shall be not less than 150mm.

The aft end of the length L (the stern section L1) shall not be nearer the bow than the centre of the axis of the rudder stock.

4. GIRTH DIFFERENCE

The girth difference, d in the formula, shall be measured in the transverse plane, vertically, at 0.55 L.W.L. from the fore end of the L.W.L., and shall be the sum of the differences between the skin girth and chain girth, measured on the two sides

of the yacht, from the mark on the covering board d to corresponding points in the hull surface at a level 575mm below the waterline.

The radius of the hull, measured in any horizontal plane at or above a level 575mm below the waterline, shall not be less than 1200mm. Local bridging by a strut to reduce the d measurement is not permitted.

5. HOLLOW IN THE SURFACE OF THE HULL

No hollows shall be permitted in the surface of the hull between the L.W.L. and the sheer line, excepting in the profile of the stern forward of the point of the measurement L1. Hollows in the surface of the hull at the stern immediately resulting from the hollow permitted in the stern profile shall not be prohibited by this clause, provided any hollows so formed fall within the buttock line 180mm from the fore and aft centerline and below measurement point L1.

For the purpose of rating, any hollows in the entry of the boat below the LWL plane shall be bridged by a straight line from points on the entry at a vertical distance of 60mm above and below the LWL plane.

6. DRAFT

The maximum draft permitted shall be 16 per cent of the L.W.L. plus 500mm. If the draft exceeds that permitted, three times the excess will be added to the rating.

Underwater Appendages

- (a) No more than one movable appendage is permitted. No movable appendage, or part thereof, shall be affixed forward of the 55% girth station.
- (b) Centerboards and similar contrivances are banned.
- (c) No horizontal keel section shall be longer or wider than any of the horizontal keel sections above.
- (d) The draft shall be taken as the vertical distance below the LWL to the lowest point of the hull or hull appendage in any position.

7. FREEBOARD

The freeboard, F in the formula, shall be the freeboard at the 0.55 girth station plus the freeboard at bow L1 ending plus the freeboard at stern L1 ending, the sum shall be divided by three. The maximum freeboard used as a minus quantity in the formula when calculating the rating shall be 620mm.

The freeboard aft shall not be taken as more than 95 per cent of the freeboard forward and the freeboard forward shall not be taken as more than 20 per cent greater than the freeboard amidships.

8. SHEER

The sheer of the yacht shall be a fair continuous concave curve.

9. TUMBLE HOME

The tumble home on each side may not exceed 30mm without penalty. When the tumble home of the side of the yacht exceeds the amount permitted three times the excess shall be added to the rating.

10. DISPLACEMENT

Displacement in cubic meters shall be not less than $(0.2 \text{ L.W.L. (in meters)} + 0.10)^3$. If a yacht is less than the displacement required by the rule for her length on L.W.L. then the difference between the length on the L.W.L. to which her actual displacement corresponds by the rule and the actual length on L.W.L. shall be doubled and added to the length measurement.

The measured displacement shall be determined for sea water of specific gravity of 1.025.

11. LIMITATION UPON MINIMUM BEAM

The minimum beam, measured at one-third of the Rule 'mid-ship freeboard above L.W.L. at the point of greatest beam on that line, shall be 1400mm. Any deficiency shall be multiplied by 4 and added to "L" in the formula.

12. SAIL AREA

The sail area (S) is the sum of the calculated rated areas of mainsail, and fore-triangle.

The rated area of a mainsail is $0.5 \times P \times E$.

The rated area of the fore-triangle is $0.5 \times 0.85 \times I \times J$. I shall not exceed 7700mm.

P = Mainsail luff length in meters

E = Mainsail foot length in meters

I = Forestay height in meters

J = Foretriangle base in meters

The base of "I" is measured from a point 70mm above the sheer line at the mast.

The clew of the biggest jib shall not extend further than $1.55 \times J$ from the luff on a line perpendicular to the luff.

13. MAXIMUM HEIGHT OF SAIL PLAN

The maximum height permitted, measured from a point 70mm above the covering board abreast of the mast and along the mast shall be 9.900m

14. MAINSAIL CROSSWIDTHS AND BATTENS

The length of the battens in the mainsail shall not exceed the following:

	Maximum
Upper batten:	Not restricted in length
Other battens:	1150mm

The battens in a sail shall divide the after leech into approximately equal parts. The total width of the mainsail, including the luff rope, at half and three quarter heights shall not exceed 67% and 39% respectively of the maximum permitted foot length E.

Maximum number of battens in sail: four
Battens in other sails are prohibited.

16. LIMIT OF SIZE OF SPINNAKERS

Masthead asymmetrical spinnakers are permitted. Bowsprits are prohibited. The maximum sizes of spinnakers are defined below.

The luffs and leeches of spinnakers shall be taped with stretch resistant tape.

The maximum dimensions of an asymmetrical spinnaker shall not exceed the following:

- (i) Luff length shall not exceed $(MAXH^2 + J^2)^{0.5}$
- (ii) Leech length shall not exceed $0.95 * \text{luff length}$
- (iii) Foot length shall not exceed $J + 2.3m$

MAXH = Maximum height of sail plan as defined in Rule 13.

The spinnaker shall be tacked as close as possible to the deck. A single tack pennant not longer than 0.610m (2.0 ft) may be used, and the pennant may be adjustable.

17. HEADBOARDS

The extension of the mainsail headboard measured perpendicular to the aft side of the mast shall not exceed 125mm. (Note in the case of an exterior mainsail luff track, measurement is to the foreside of the groove.) Headboards are prohibited in all other sails.

18. RIG

The mast and boom shall be constructed of wood or aluminum alloy. The use of other materials is prohibited.

A mast shall have a section area of not less than 70 cm^2 from the step to 150mm above the top of "I". Above this point the mast may be tapered, to a

minimum section area at the upper measurement band of 25 cm². No part of the mast surface shall be concave.

The weight of the mast, including all fittings (including the heel plug if any), but excluding standing and running rigging, shall be not less than 25 kg. The center of gravity of the mast shall be not less than 3.80m above a point 70mm above the sheer line.

Running backstays are prohibited.

The weight of the boom, including all fittings, but excluding mainsheet, boom vang, running rigging, and blocks, shall be not less than 4.0 kg.

Standing rigging shrouds and stays shall be 1 x 19 stainless steel wire. The use of rod rigging or other materials is prohibited.

Minimum diameter of upper shrouds is 3/16" (4.8mm)

Minimum diameter of lower shrouds is 7/32" (5.6mm)

Minimum diameter of forestay is 7/32" (5.6mm)

Minimum diameter of backstay is 1/8" (3.2mm)

19. CONSTRUCTION

The hull structure, including frames, stringers, keelson, and bulkheads, shall not weigh less than 16.5 kg/m² of hull surface area.

The deck and cockpit well structure, including beams and stringers, shall not weigh less than 10.6 kg/m² of deck and cockpit well surface area.

The materials permitted for the construction of hulls, decks, and cockpit wells, are as follows:

- (a) Fiber reinforcements
Only glass fibers of type "E", "R" and "S" are permitted. Reinforcements of higher specific modulus are prohibited.
- (b) Resins
Polyester, vinyl ester and epoxy type resins are permitted as are all bonding compounds.
- (c) Timber
Wood of any species is permitted.
- (d) Fastenings
Any commercially available fastenings are permitted. The weight of any fastenings shall be additional to the above minimum defined weights of structure.
- (e) Core Materials
Timber and thermoplastic cores are permitted. These shall have a density of not less than 70 kg/m³. Aramid and aluminum honeycomb cores are prohibited.

22. COCKPITS

Cockpits must be self-draining and essentially watertight.

A cockpit sole must be at least 120mm above L.W.L.

The total volume of all cockpits below the lowest coamings shall not exceed 2.0m³.

21. BALLAST

The material used for the ballast keel and fixed inside ballast shall be no heavier than lead.

The weight of the ballast keel shall not exceed 55% of the total weight of the yacht in measurement trim.

22. MEASUREMENT TRIM

All measurements shall be taken without crew on board.

The following portable or semi-portable items shall be on board and in normal position of use when the yacht is measured afloat:

- (a) Mainsail, genoa jib and spinnaker.
- (b) Spars and standing rigging.
- (c) Anchor (minimum weight 7kg), chain and warp (minimum 30 meters, 40mm circumference).
- (d) All winches normally used, including complete drive units, pedestals and cranks, together with no fewer than two handles for deck capstans or geared winches.
- (e) Hatch covers.
- (f) Sheaves or turning blocks for genoa and spinnaker sheets, or snatch blocks if these are used in place of turning blocks.
- (g) Floorboards as normally used.
- (h) Electronic equipment or other equipment used to record or analyze performance.
- (i) One fixed pump or one portable hand pump, including overboard discharge.

The following items may be removed from the yacht when measured afloat:

- (a) Running rigging, including halyards, sheets, guys and tackles.
- (b) Lifebelts or similar lifesaving equipment.
- (c) Extras and spares.
- (e) Tools and miscellaneous portable items not otherwise required to be on board.

Notes:

Equipment - all items in the above Schedule shall be bona fide of the nature common to the usual fittings of a yacht. Unspecified equipment carried when

racing shall not be of the nature of ballast or merely carried for the purposes of stiffening the yacht. Consumable stores carried when racing shall not exceed 20kg including liquids.

No specified equipment shall be stowed below cabin floor, but light articles not specified may be stowed below the cabin floor, if the specific gravity of such articles does not exceed that of salt water.

Free flooding compartments are prohibited.

23. CREW

The maximum number of persons on board during a race shall be 2.

24. PROPELLER ALLOWANCE

If a yacht is fitted with an engine and propeller which conform in every way to the conditions prescribed below while racing, the sail area calculated in Rule 12 above shall be multiplied by the following factor prior to use in the rating formula in Rule 2. If an engine and propeller are not fitted or the engine/propeller installation does not comply with all the following criteria, the propeller factor shall be 1.000.

Propeller factor = 0.965 for solid propellers
 = 0.985 for folding or feathering propellers

This factor shall be applied as follows:

S (for use in the Rule 2 Rating Formula) = S (from Rule 12) x Propeller factor.

To qualify for this correction all the following conditions shall be observed:

- (a) The yacht shall be able to achieve a speed of 4 knots under power with bare poles in still conditions.
- (b) The propeller diameter shall exceed 225 mm and may be solid, folding or feathering.
- (c) The propeller, shafting, aperture, or strut drive shall be exposed to the water flow whilst racing and shall not be fitted with covers or fairing strips.
- (d) The engine, shafting, and propeller must be permanently installed.
- (e) If the propeller is fitted in an aperture the clearance from the aperture to a propeller blade in any position shall not be less than 50 mm.