

SPECIFICATIONS

1.0. EXPLANATIONS

1.1. Important - In interpreting any point not covered, or wording of obscure meaning, the TAB shall consider the intended meaning, rather than any technical misconstruction that might be derived from the wording, and shall bear in mind at all times the basic principle of the specifications which is to maintain the Star within reasonable limitations as a standard one-design class.

1.2. Dimension and Weights in these specifications are in Standard International (S.I.) metric units, except that mass is usually called weight. When not otherwise specified, measurements of lengths are in millimeters (mm).

1.3. Requirements - A yacht, its spars and sails, must conform strictly throughout with respect to design, dimensions, construction, and material, to the official plans and specifications of the ISCYRA., subject to Class Rule 33, to be considered a Star and be eligible to the ISCYRA. THE ISCYRA'S MEASUREMENT CERTIFICATE IS THE ONLY RECOGNIZED PROOF OF ELIGIBILITY TO THE STAR CLASS.

1.4. Yacht's Number - Before a certificate can be issued, a yacht's number must be permanently affixed in not less than 51 mm figures in clear view.

1.5. Options - Nothing is optional in these specifications unless the word optional appears, and then only within the limitations described, in which case that which is mentioned is that which is recommended, in points of both safety and speed. Use of a substitute, even where allowed, is always at user's risk.

1.6. Materials.Wood:

As a guide in selecting materials, the following table indicates densities of woods specifically referred to in the articles below.

Weights with 15% moisture:

Mahogany 512 kg/m³

White Oak 712"

Port Orford Cedar 481"

Red Cedar 385"

Sitka Spruce 433"

Plywood, veneer board, laminated woods, pressed wood, fiberboard, composition board, balsa, cork, and woods without sufficient strength to hold fastenings shall not be used unless specifically mentioned.

1.7. Materials- Glass Reinforced Plastic (GRP):

Long strand glass fiber material may be used with a rigid, high strength resin, provided that the glass content of the combination exceeds 35 percent of the total by weight. Rigid, low density material, such as balsa, Aerolam, or plastic foam, may be used as a core between surfaces of fiberglass laminates. All materials used must have low absorption and high resistance to deterioration when in continuous contact with either fresh or salt water. Aluminum, Nomex, or other metallic honeycomb core materials are permitted, but only for use as flat panels such as are used for flotation bulkheads and other internal hull stiffening. Such materials are not approved for hull or deck core material.

Carbon fiber, Kevlar, R or S glass fibers or other exotic materials are not allowed in any new construction or repair of GRP or wood boats

1.8. Plan Approval - Glass Reinforced Plastic (GRP) Construction:

Pre-preg fibers in any combinations are not allowed, each builder's method of construction must be approved by the TAB prior to the start of construction. The submitted plans must contain enough detail to adequately describe all materials, attachments, and the local reinforcements as well as the general construction of the hull, deck and skeg. Pre-preg fibers in any combinations are not allowed.

1.9. Recommendations - The recommendations listed in the Specifications are based upon years of experience of many Star owners and builders.

2. HULL DIMENSIONS

All Measurements for location of rudder, keel, mast, jib downhaul, Point "B", stations, and length overall start from Point "T", the mid-point of the true transom which is the fair intersection of the outside planes of the transom and the deck exclusive of moldings. See 14, Limitations and the plans for dimensions. Point "B" is on the centerline of the boat, at the height of the top of the deck edge at the sizes, 4477 mm forward of Point AT". All deck measurements are taken exclusive of moldings. Measurements are to be taken of the truly faired shape of the hull. The use of bumps and hollows at measurement points is specifically prohibited.

NOMINAL DIMENSIONS

Length Over-all 6922

Waterline length 4724

Beam at deck 1734

Draught 1016

Beam at chine 1372

3. HULL CONSTRUCTION - WOOD

3.1. Planking

3.1.1. KEEL PLANK - Not less than 19, nor more than 22 thick.

3.1.2. BOTTOM PLANKING - Not less than 19 thick, nor more than 22 thick. The two planks along side the keel plank may have a small groove cut into them for drainage which shall be not more than 6 deep and 19 wide.

3.1.3. TRANSOM - Not less than 22 thick. Angle of transom must be to bevel shown on plans.

3.1.4. TOPSIDES - Not less than 19 thick, nor more than 22 thick, planks full length if possible.

3.1.5. OPTIONS - Any number of planks may be used, but double planking is not allowed. Any kind of wood can be used, except as noted in Sec. 1.6. Type of seams optional. A rabbeted chine log or beveled chine blocks are permissible if not so designed as to weaken the joint between side and bottom frames.

3.1.6. RECOMMENDED - Mahogany keel plank; others red cedar.

3.2. Frames

3.2.1. FRAMES - 343 center to center. In way of fin keel (nos. 9 through 13) to be sided 38, molded 38, tapered (in straight line) towards end to sided 32, molded 38. All other bottom frames to be sided 32, molded 38. Side frames to be moulded 32, sided 22 in the top portion, expanding into knees in the bottom portion overlapping the bottom frames at least 114. The width of the knees (side frames) along a line bisecting the chine angle shall be no less than 89, and they shall fair into the straight upper portion of the frame no less than 152 above the inside chine knuckle. Overlap may be reduced to 89 at frames 3 and 18, and 64 at frames 2 and 19. The width along the bisecting line may be reduced in proportion at these points. If keel bolts are over 16 diameter, the bottom frames in way of keel must be increased in siding by the amount of such overage.

3.2.2. OPTIONS - Additional frames may be added, but specified frames must be shaped, centered, and joined approximately as shown. May be larger but must be no less than dimensions given. Frames as shown may be laminated of bent strips, but must be standard size, shape, and design.

Limber holes in the form of notches not more than 9 deep and 32 wide may be cut in the bottom side of bottom frames and side frames where they lie against the bottom planking not more than 38 from the ends of the bottom frames.

3.2.3. RECOMMENDED - Mahogany.

3.3 Stem

3.3.1. STEM - Sided 76 molded as shown.

3.3.2. OPTION - May be built up of laminated bent wood strips, thus simulating a natural crook. Must be of shape and dimensions shown on plans.

3.3.3. RECOMMENDED - Mahogany, Sitka spruce, hackmatack.

3.4. Deck

3.4.1. DECK- 11 thick.

3.4.2. OPTIONS - Additional thickness allowed. Canvas, fiberglass (resin) or other covering may be used. Weather strip or rend optional, but shall not extend more than 13 beyond measured deck edge. Plywood decks may be used but shall be at least 8 thick.

3.4.3. RECOMMENDED - Cedar.

3.5 Deck Beams

3.5.1. Large Beams - forward and aft of mast and at ends of cockpit sided 32, molded 38.

3.5.2. OTHER DECK BEAMS - sided 22, molded 32.

3.5.3. OPTIONS - Beams may be larger, but shall not be less than dimensions given. Hanging knees and stanchions shown on plans may be modified or omitted, provided sufficient bracing be used to stiffen the boat and counteract stresses at those points as determined by the TAB.

3.5.4. RECOMMENDED - Sitka spruce.

3.6. Fastenings

3.6.1. Planking must be fastened to frames with screws, or serrated shank nails, but must be fastened to transom, stem, and joined at chine with screws. Glue and/or dowels shall not be substituted for metal fastenings.

3.6.2. OPTIONS - Any metal fastenings allowed.

3.6.3. RECOMMENDED - Silicon bronze screws.

4. HULL CONSTRUCTION - GLASS REINFORCED PLASTIC (GRP)

4.1. Conditions- Regulations are imposed on the use of GRP construction to prevent attainment of unfair performance advantages from its substitution for wood in the structures of the yacht. In any case where there is a question as to the interpretation of these regulations, it is the responsibility of the builder to obtain a decision from the TAB prior to the start of construction.

4.2. Hull - With certain approved exceptions, the bottom, sides, and transom must be of a uniform structural mass throughout. The weight per unit area of any part of the hull, including a representative portion of any structure required to stiffen the surface, must equal or exceed 8.8 kg/m². Thickness of the glass-foam-glass sandwich shall be sufficient to provide the flotation required by Section 7.

4.3. Deck - With certain approval exceptions, the deck must be of a uniform structural weight throughout. The weight per unit area of any part of the deck, including a representative portion of any structure required to stiffen the surface, must equal or exceed 5.4 kg/m².

(Originally, GRP specifications were written in order to make GRP yachts comparable to those made of wood. With the exceptions of heavier frames and special braces, keelsons, etc., wood boats are "uniform" (i.e., uniform plank thickness and frame cross-sections). Accordingly, GRP (fiberglass) yachts are to be "uniform" in the basic lay-up of the hull and deck. The 8.8 kg/m² required in the hull and the 5.4 kg/m² required in the deck represent an average of the total weight including necessary stiffening. Thus the actual weight of a uniform lay-up for the purpose of uniform construction may be something less than the 8.8 kg/m² (hull) and 5.4 kg/m² (deck).

Because of the infinitely possible combinations of core materials, resin mixtures, different types of fiberglass cloth (weave and thickness), which would be satisfactory for Star construction, no specific lay-up has been written into the Specifications. Rather, it has been required that builders submit their construction plans and detailed lay-up schedule to be approved by the TAB before the builder begins construction. It is our view that the unit surface weight is self-limiting due to the need for hull stiffness and the constraint of overall hull weight. Too thin a surface would result in too much hull flexibility and inferior speed and durability. Too thick a surface will deprive the stiffening structure of the material required to make the boat rigid and have the same results. However there are certain conditions where either extreme might be advantageous and therefore it is essential to maintain the required uniformity. When plans are analyzed for approval they are viewed in this light. Any plan which deviates toward either of the two above extremes is rejected. All approved plans are on file in the Central Office along with sample lay-ups for the uniform construction. It is expected that these construction plans be followed by the builder and that any significant changes in the GRP lay-up that a builder may wish to use must be first approved by the TAB.

Secs. 4.2 and 4.3 provide for "certain approved exceptions" to the uniform construction. The practice of increasing the lay-up thickness and weight in addition to the uniform construction, along the bottom from slightly forward of the mast step to slightly aft of the rudder post is an approved exception. Other exceptions would include, but are not necessarily limited to: hull to deck joints, areas where special fittings are attached, bulkhead and stiffener attachments, etc. However, these items must be shown in sufficient detail as a part of or addendum to the plans before the plans receive final approval. –TAB, 1978)

4.3.1. DECK INSTALLATION - The deck must be attached to the hull in a manner which adequately resists the torsional forces in the hull and prevents the formation of leakage through the joint. The weight per unit area of any part of the joint must equal or exceed that of the surface in which the joint is made.

4.3.2. RECOMMENDED - A flush lap joint in the surface of the hull, cemented with a rigid adhesive resin and riveted.

4.4. Local Reinforcements - The hull and deck shall be reinforced as necessary to provide adequate support of the mast step, keel, skeg, rudder, cockpit opening and rigging. Such reinforcements may be in addition to the uniform mass of the hull and deck, provided that they are not so constructed to intentionally ballast the hull.

4.4.1. RECOMMENDED - Approximately 4.5 kg of structure should be allotted to these reinforcements.

4.5 Metal Inserts - Inserts of corrosion-resistant metal may be included as part of the hull and deck for attachment of rigging, tensile supports for the mast step, or attachment of normal equipment. Such inserts must be limited to the size and number necessary to perform their structural functions and must not be so constructed or arranged to intentionally ballast the hull. The tracks for running rigging and metal parts necessary to secure the keel to the hull are not to be considered as a part of the hull or deck.

5. CONSTRUCTION DETAILS GENERAL

5.1. Keelson - To be wood, 152 x 19 minimum length from Station 2 to Station 8. Shall weigh not more than 5 kg in GRP hulls.

5.1.1. OPTIONS - May be tapered forward of Station 5 and aft of Station 7, to not less than 76 x 6.3. May be omitted in GRP hulls.

5.1.2 RECOMMENDED - Mahogany.

5.2. Mast Step

5.2.1. POSITION - 152. fore and 102 aft variation of position allowed. Design optional. No lateral variation allowed.

5.2.2. RECOMMENDED - Mahogany.

5.3. Rudder- Must conform in size, design, shape and position to ISCYRA Drawing "F". No concavity in profile except providing no downward extension on the skeg exists, the rudder may be joined to the skeg with a concavity extending a distance no greater than 13mm from the profiles of the skeg and rudder. May be of wood, including plywood, solid, but may be sharpened. May be of GRP or sandwich construction.

5.4. Skeg - To be rigidly attached to the hull structure.

5.4.1. DIMENSIONS - Not less than 25 thick at rudder post and not more than 32 at any point. A radius max 38 is allowed at junction with the hull. The maximum depth of the skeg at the rudder post centerline shall not exceed 432. The maximum length of the skeg from rudder post forward along the bottom contour of the hull shall not exceed 940. (Length requirement does not apply if the aft edge of the keel forms the termination of the skeg.) The contour of the bottom of the skeg can at no point be more than 26 above or below a straight line between the maximum allowable depth and length points, and may not be concave, except that the skeg may be joined to the trailing edge of the keel with a fillet of no greater than 26 radius, and may extend downward a distance of no greater than 13 from a point no greater than 13 from the leading edge of the rudder. Depth of the skeg shall be measured to the extension of its bottom line, as if such downward extension did not exist. The average weight of a skeg shall not exceed 14.7 kg/m², the skeg shall not be hollow.

5.4.2. OPTION - May be of wood, including plywood. May be of GRP or sandwich construction.

5.5. Tiller - Design and construction optional, but must be of approved materials. (not retroactive to Measurement Certificates approved before 1 January 1990). When in its lowest position, the bottom of the tiller shall be above the deck centerline when viewed in profile, both at the aft end of the tiller and at Station 8.

The TAB has approved the following materials for tillers: wood, steel, and stainless steel, aluminum, GRP.

5.6. Rudder Post - Position only as per plans, of solid stainless steel, not less than 25 in diameter, rudder to be thoroughly fastened to it. Method and material of fastening optional.

5.7. Fin Keel - To be of solid gray cast iron free from substantial imperfections. Shall conform to ISCYRA Drawing 4 and the limitations. As a rust preventative, the keel may be painted, plated, galvanized or coated with fiberglass (GRP), provided that such coating shall have a specific gravity not greater than the iron. Keel shall not be bored or plugged to affect its weight or center of mass. The outer edge of the flange may be set flush with the true bottom of the hull, or the top of the flange may be no lower than the true bottom.

5.7.1. WEIGHT - Weight of the keel including coatings: minimum 394.5 kg, maximum 408.5 kg. A Keel Weight Certificate signed by a Certified Measurer, is required with the Measurement Certificate for any new boat or any change involving the keel.

5.7.2. FAIRING STRIPS - Fairing strips may be installed around the keel flange, but shall measure not more than 305 from outboard edge on one side to outboard edge on the other, and shall extend not more than 305 forward or aft of the flange.

5.8. Stem - Sided 76, molded as shown. The actual bow must be a true prolongation of the sides and deck and come within 35 of Point A.

6. COCKPIT

6.1. Cockpit - Open, as shown on plans. One bar or athwartship traveler, not over 76 wide at top center, is allowed. The forward end of the cockpit opening is limited with 3685 maximum forward of Point "T" and the aft end with 1605 minimum forward of Point "T".

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6.2. Options - Self bailing type allowed. Cockpit may be rounded at corners of ends and/or at crossbar, but maximum allowed radius of 305. No hatch, shelf or other device, including any part of the crossbar, which reduces the open area of the cockpit beyond the foregoing limitation, is allowed.

7. FLOTATION

7.1. Flotation - To provide adequate flotation in the event the hull becomes filled with water, the sealed volume contained in the structure of the hull and deck plus any additional volume permanently installed within the hull must equal a total of 720 liters (dm³). At least 340 liters of this volume must be contained within the uniform weight distribution of the hull structure as required by Specs.4. Boats of wooden construction will be credited with 340 litres of flotation contained in their normal structure.

Additional flotation must be added so as to total at least 720 liters of positive buoyancy. This may be provided by sealed compartments or tanks or closed cell foam type materials. It may also be incorporated in the construction of the hull. The location of the flotation devices shall be such that the buoyancy effect is essentially balanced about Station 6 (approximately 1525 aft of the mast) for the purpose of floating the boat level or in slightly bow-up attitude.

On boats built prior to January 1, 1974, commercial buoyancy bags manufactured specifically for this purpose are permitted. They shall be installed in accordance with the manufacturer's recommendations and in such a way as to resist chafing and movement due to surging water should the boat be swamped. 1 kg of rated buoyancy = 1 liter. When buoyancy bags are employed they must be kept inflated.

8. COAMING Coaming - Optional, or may be omitted.

9. HULL FINISH

9.1. Hull Finish - Painting or coating optional, except that the application of ribbed or otherwise specially structured material (such as "riblets") is prohibited.

9.2. Refinishing - Refinishing with any coating, including GRP on wood hulls, is permitted provided that the dimensions of the hull are not changed (within the accuracy of normal measurement).

10. SPARS

10.1 Spars - Hollow spars are permitted. Concave surfaces in either transverse or longitudinal planes are not allowed, with the exception that concavities arising because of adding a track or a tunnel are permissible. Depth, including track and tunnel, cannot be more than 1 1/2 times the width (athwartships) at any section, and spars shall be no wider than they are deep at any section.

10.1.1. Approved materials as follows:

Approved Materials for MASTS and BOOMS: Wood, Aluminum alloy of at least 90% Aluminum.

For whisker poles: Wood, Aluminum alloy of at least 90% Aluminum, GRP or any combination of the above.

10.2. Measurement Bands - To be painted on spar, 25 wide, of contrasting color. Where spars are too short to include full 25 width band, entire end of spar must be painted contrasting color except that where spars end exactly at measurement points or are shorter, no measurement band is necessary. Spars are to be supplied with permanent stops or limits to prevent sail from being extended past bands. A masthead halyard lock is a permanent stop.

10.3. Mast - Maximum height from Point "B" to bottom edge of upper band, 9652. Upper edge of mainsail headboard shall not extend above this point. Minimum height from Point "B" to upper edge of lower band, 381. Bottom of groove in boom, projected if necessary, shall not extend below this point.

Minimum section from 991 above Point "B" to 5105 above Point "B" is 57 x 70. Minimum section weight between these limits is 1.34 kg per linear meter.

Tapering is allowed from 5105 above Point "B" to top, except that wood masts may be tapered in any way provided that they conform to depth-width ratio at all sections. Minimum section is 32 x 32.

From heel of mast to 991 above Point "B", mast section is optional.

Forward face of mast from Point "T": min. 4420, max. 4680.

Mast may have one luff groove. Rotating masts are not allowed.

10.3.1. RECOMMENDED 57 x 70.

10.3.2. SPREADERS of any approved material. Size, design and number are optional.

10.3.3. TIP WEIGHT - A fully rigged mast must have a tip weight of 7 kg or more when measured as follows:

(a) Halyards are in sailing position and mast is horizontal.

(b) Mast is supported at the upper edge of lower measurement band on sawhorse or other suitable pivot.

(c) All rigging is tensioned so that none of it above the lower measurement band sags lower than 600 mm below the spar or touches the ground. Tying with light twine is permitted.

(d) All rigging extending below the measurement band is draped over the sawhorse.

(e) The mast-head fly, if any, is left in place.

(f) A scale reading of tip weight is taken at bottom edge of upper measurement band.

Make-up weight to meet tip weight may be added at any location on the mast provided that it is permanently fastened.

10.4 Boom - Maximum distance from forward face of luff rope groove on mast, extended if necessary, to forward edge of measurement band, 4445.

Boom may have one foot rope groove.

10.4.1. CUTOUTS in the boom surface:

(a) Aft end of the boom may be tapered by cutting away the bottom of the section a maximum of 685 mm forward of the measurement band. This taper may not be concave when viewed in profile.

(b) Cutouts are permitted for proper clearance to pass lines and wires.

(c) No other cutouts are permitted.

10.4.2. On booms manufactured after 31 Dec. 1990, no portion of any external surface located more than 25 from the center of the foot groove shall have a radius of less than 19 except in way of cutouts.

10.5. Whisker Pole - Length min. 2286, max. 2896, measured at greatest extension from surface of mast when whisker pole is in place to outboard point on pole where the jib or jib sheets are constrained. Length may not be adjustable.

10.6. Reefing Equipment - Not allowed.

11. RIGGING

11.1. Jibstay - Shall be of steel or stainless steel not less than 2.29 in diameter and shall intersect the forward side of the mast min. 6782, max. 6934 above Point "B", and shall intersect the deck at a point min. 6610, max. 6712 forward of Point "T". For the purpose of these measurements, it shall be assumed that the jibstay intersects the mast at an angle of 17E. The jibstay must be carried outside the jib, must be kept fastened at all times, and may be slacked only enough to allow the jib luff wire to take the greater strain. The Jibstay may have a firmly fitted tube or coating totaling a maximum of 7,2 mm in diameter.

If the jib can be attached without disconnecting the jib luff wire (for example by hanks or tabs), then the use of only one headstay is permitted provided that it meets the above jibstay specifications.

The Jibstay may have a firmly fitted tube or coating totaling a maximum of 7,2 mm in diameter.

11.2. Other Rigging - All standing rigging shall be of steel or stainless steel. Running rigging including the backstays may be of any material.

12. SAILS

12.1. Sails - Allow polyester woven material not lighter than 3.7 ounces per sailmaker's yard, (0.158 kg/m) for mainsails and polyester woven material not lighter than 4.7 ounces per sailmaker's yard for jibs. The mainsail shall carry a 406 diameter red star, with the yacht's number beneath or on the leech. The numbers shall be not less than 381 in height and occupy a width of not less than 254 per numeral (except for the figure 1), the strokes having a thickness of not less than 64.

There shall be a space of at least 102 between consecutive numerals. Numbers must be clearly legible on both sides of the sail, and should not be back to back. Jib booms or clubs, roach reefs, double luff mainsails, loose-footed mainsails, and perforated sails are barred. Unwoven transparent panels, not exceeding 1.25 m² in total area, are permitted below half height in any sail. Only mainsail and jib are allowed. Reinforcement, of any fabric having the effect of stiffening the sail, is permitted only within the dimensions listed in Sec. 12.2. This reinforcement shall be capable of being folded. Other reinforcement, as a continuation of corner stiffening or elsewhere, is permitted provided that it can be folded and is not stiffened by the addition of bonding agents, close stitching, or otherwise. Glued seams shall not be considered stiffening provided that they can be folded as described above. National letters, if displayed, shall be affixed to the mainsail in accordance with the official class sail plan.

12.2. Mainsail - Length of luff and foot governed by measurement bands on spars. See 10.3 and 10.4. Roach and draft governed by cross width from middle of leech to nearest luff point including bolt-rope, which shall not exceed 2807, the roach of leech having a normal curve. A normal curve is defined as a smooth curve that deviates no more than 13 from a straight line between battens. Roach and draft governed by cross widths not exceeding 2807 from the middle of the leech and 1665 from the three quarter point of the leech to the nearest luff point including bolt-rope. The roach of the leech shall be defined as a smooth curve that deviates no more than 13 from a straight line between battens.

Maximum dimensions:

Leech 9779

Headboard, perpendicular to luff 114

Reinforcement (maximum distance of stiffening from corner) 432

Distance of advertisement or sailmaker's mark from corner 610

12.3. Jib

Maximum dimensions:

Luff 6299

Leech 5486

Foot 2235

Advertisement radius 337

Leech, roach, and draft shall be governed by measurements taken across the jib from points 500, 2000 and 4267 mm down leech and luff from the top of the measurement triangle. These cross measurements shall not exceed 275 mm, 875 mm and 1600 mm respectively. Leech and foot curve must not have concavities except that the leech may be hollow between battens. This hollow shall not exceed 15 mm. Headboards are not allowed. Clew boards shall be permitted only within a distance of 76 from the apex of the clew. For measurement all the corners of the jib must simultaneously fall within a triangle of the above dimensions, and no portion of the sail shall fall outside of the triangle for at least 76 from any corner of the triangle. Foot roach shall not fall outside the measurement triangle more than 76 at any point. The center of the grommet or thimble to which the halyard attaches shall not be farther than 38 from the luff of the jib. Cunningham not allowed. Tack of the jib shall at all times be fastened within the jibstay location and on centerline of the boat. Jib may be set flying, but a jibstay is obligatory and luff wire in the jib shall not be considered a jibstay, except as provided for in Sec. 11.1.

12.4. Battens - Mainsail: Four in mainsail spaced on leech as per plan. Upper batten, no restriction on length, all others not more than 1219 mm. Material GRP. Jib: Three allowed in jib, located as per sail plan, top batten pocket not to exceed 488 mm, 2 lower batten pockets not to exceed 598 mm. Material GRP. Batten pocket inside width not more than 50mm.

12.5. Measuring - Sails shall be measured in accordance with the requirements of Star Class Rule 32.

12.6. Sail Royalties - An ISCYRA sail royalty button must be permanently affixed to every mainsail and every jib. It is the obligation of the sailmaker to buy these buttons from the ISCYRA Central Office at \$50 USD each. No sail can be used for racing without a button: it is not a Star sail unless the royalty button appears thereon.

13. WEIGHT

13.1. Minimum weight of boat with all rigging, mast, and boom and including all items permanently fastened to the hull, including removable wooden floor boards not exceeding 11.3 kg. Shall be not less than 671 kg. Permanently fastened floorboards are not allowed. In the event that the weight of the boat is less than this amount the difference shall be made up only by the addition of any material securely fastened to the underside of the deck. Material shall not be added or built-in to standard members or hardware for the sole purpose of obviating such correction.

13.2. In addition, the hull must comply with the following: The weight of the hull and attached deck must exceed 190.5 kg. If the skeg is also included, the weight of the total assembly must exceed 192.5 kg. Included with the hull in these weights are exclusively the chainplates, jibstay attachment fitting, the mast step with its supporting structure, built-in bulkheads and deck supports, a keelson (optional in GRP hulls), the rudder post tube and flotation.

13.3. If additional material is added to make up weight, as required by Section 13.1, such material shall be sealed by a Certified Measurer. The seal or seals applied shall be impressed or attached such that no part of the material can be removed without irreparable damage or destruction of the seal. Seals shall be distinctively marked for identification. If no additional material is required under Section 13.1, a seal as above shall be attached within the hull. A boat must bear such seal or seals to be in conformance with measurement rules.

14. LIMITATIONS

In addition to the foregoing, there shall be permanently affixed to the after end of the cockpit coaming a plaque stating the amount of the additional material, if any, so affixed.

Yacht shall be measured on keel, with spars and rigging removed, or with rigging slack, and hull unsupported; and in accordance with instructions issued to Certified Measurers by the TAB. Measurements shall be recorded on the ISCYRA measurement form. Although only certain specific points on a Star are regularly measured and appear on the measurement certificate, it shall be thoroughly understood that any point may be measured, at the discretion of the ISCYRA TAB, and shall be in accordance with plans, specifications, and the following limitations.

14.1. Hull

14.1.1. Hull shapes must conform to limitations shown on ISCYRA Lines Drawing No. 1 and these specifications. No hull waterline, when viewed in plan, shall have a concavity. *Not retroactive to Measurement Certificates approved before 1 January 2016*

14.1.2. Deck shape at cockpit edge must conform to limitations shown in ISCYRA Drawing 1.

14.1.3. Discontinuities in Deck Surface. Certain portions of the deck surface may be grooved or raised provided that the construction ensures that the structural integrity of the deck is as if the deck were one piece without the discontinuities. No fitting or deck discontinuity shall extend, or be mounted, below or outboard of a line defined by the extended surface of the sides or transom. A jib sheet or main sheet when led from the sail or boom to the deck must lead through or attach to a fitting which is mounted on the deck or to a car on a track that conforms with the requirements of this Section. Further, the deck may not be depressed below its normal arc shape in way of such a fitting attached to the deck. No sheet may pass below tangent with the normal deck surface in way of such a fitting. Provided that the above requirements are met, it is permitted to lead the main sheet to a block on the bottom of the interior and thence forward to the cockpit.

Only those discontinuities listed below are permitted.

(a) Depressed Portions.

Slots and grooves are permitted for handholds and for proper clearance of wires and lines emerging from below decks, provided that they do not violate the integrity of flotation compartments, and for installation of tracks for athwartships and/or fore and aft movement of fittings. Any fitting mounted on a track shall not be lower than the same fitting mounted on the normal deck surface. Nor shall the track which carries such fitting be mounted so that the upper track surface is below the normal deck surface. Small drain holes are permitted.

The following fittings are included:

1. Jib travelers, including bridge type.
2. Mainsheet travelers.
3. Running backstays.
4. Boom vang (circular type).
5. Boom vang (dingy type). A semi-circular truncated cone shaped depression is permitted in the deck at the after end of the mast partner slot provided the inside radius is no more than 254 mm and the depth is no more than 51 mm.
6. Hiking vest attachments.
7. Side deck depressions which house cleats for control ropes on both sides of the cockpit.

(b) Raised Portions.

The following items are permitted:

1. Mainsheet traveler (outer ends).
2. Backstay tracks (forward ends).
3. Shroud tracks.
4. Vang tracks.
5. Mast partner openings (all around).
6. Spray rails.
7. Cleat mountings.
8. Winch mountings.
9. Turning blocks.
10. Nonskid portions of the deck.

14.1.4. At most two watertight hatches, not larger than 153 clear-opening diameter, and essentially flush, are allowed in the deck. Only one is permitted in the foredeck and one is permitted in the afterdeck.

14.2. Through-hull Bailers and Drains - Optional

14.3. Measurements

14.3.1. Dimensions are to be taken to points defined at the intersections of or fair extensions of the limiting adjacent surfaces or edges.

Hull Station 1 is 6401 forward of "T". Hull Station spacing is 686.

DIMENSION AT - Distance from Point "T" to extreme forward edge of deck mast opening, (the most forward point to which mast may be moved at deck). Min. 4426, max. 4680.

DIMENSION B - Distance from aft extremity of deck (exclusive of molding) to aft side of rudder post at deck. Min. 1143, max. 1194.

DIMENSION C - Horizontal distance from aft plumb bob (exclusive of molding) to aft side of rudder post where it emerges from hull bottom. Min. 1272, max. 1329.

DIMENSION E - Horizontal distance from aft plumb bob (exclusive of molding) to point on hull bottom which would be intersected by aft edge of keel fin if extended upwards. Min. 2150, max. 2170. (Not retroactive to Measurement Certificates approved before 1 January 2015.)

DIMENSION OT - Distance from Point "T" to intersection of jibstay with deck. Min. 6610, max. 6712.

DIMENSION P - One half width of cockpit. Min. 288, max. 311.

DIMENSION R - Length of cockpit. Min. 1949, max. 2064.

DIMENSION T - Angle of transom in degrees from aft plumb line. Min. 15E, max. 21E.

14.3.2. KEEL

(a) Keel Station 1 is defined as the intersection of the keel bottom plane and the line of the leading edge extended downward. All other keel stations are at 152 intervals from Keel Station 1.

(b) Except for Keel Station 1, the maximum width of the bulb at any station shall occur between 76 and 127 above the keel bottom plane.

(c) All keel radii, when viewed in profile, shall be as shown on the keel drawing plan plus or minus 33% of the drawing value.

(d) All keel bottom radii, when viewed in cross-section, shall be between 19 and 44.

(e) No keel waterline, when viewed in plan, shall have a concavity.

(f) Drawings for all new keel patterns must be submitted to the Chief Measurer for prior approval.

DIMENSION K-1 - The length of the fin at a height 406 above the bottom of the keel. Min. 1143, max. 1169.

DIMENSION K-2 - The length of the bulb at a height 102 above the bottom of the keel. Min. 1212, max. 1238.

DIMENSION K-3 - The horizontal distance from a plumb bob dropped from a position on hull bottom which would be intersected by aft edge of keel fin to the aft edge of the keel fin at a height of 406 above the bottom of the keel. Min. 32, max. 54.

DIMENSION K-4 - Length of keel fin from a point 76 below hull at aft end to a point 76 below hull at forward end. Min. 1349, max. 1375.

DIMENSION K-5 - Thickness of keel fin at thickest point. Min. 19, max. 26.

Dimension K-6 - Vertical distance from bottom of hull at Station No. 6 to bottom of keel. Min. 762, max. 781. The maximum radius allowed in joining the keel flange to the keel fin, measured in an athwartships plane, is 38.

DIMENSION K-7 - Thickness of keel bulb at thickest point. Min. 209, max. 222.

DIMENSION K-8 - Maximum height of the bulb from the bottom of the point on the keel to the fin where it just begins to thicken toward a transition with the bulb. Min. 286, max. 311.

DIMENSION K-9 - Vertical distance from bottom of hull at aft end of keel to bottom of keel. Min. 800, max. 826.

DIMENSION K-10 - The horizontal distance from Keel Station 1 to a plumb line dropped from a position on hull bottom which would be intersected by aft edge of fin keel extended upward. Min. 914, max. 965.

DIMENSION K-11 - The breadth of the keel bulb at the point 51 aft of the leading edge at waterline 4. Min. 77, max. 144.

DIMENSION K-12 - The breadth of the keel bulb at the point 51 aft of the leading edge at waterline 6. Min. 81, max. 152.

DIMENSION K-13 - The breadth of the keel bulb at the point 51 aft of the leading edge at waterline 8. Min. 65, max. 122.

DIMENSION K-14 - The height of the keel bulb from the keel bottom in vertical alignment with intersection of aft edge of keel fin at hull bottom. Min. 244, max. 315.